NEW CHALLENGES OF ECONOMIC AND BUSINESS DEVELOPMENT 2017

18-20/05/2017/Riga
University of Latvia

PROCEEDINGS

International Scientific Conference

New Challenges of Economic and Business Development – 2017
Digital Economy

Proceedings

Organised by Faculty of Business, Management and Economics,
University of Latvia

In cooperation with
European Commission Representation in Latvia
Latvian Information and Communications Technology Association

May 18-20, 2017
Riga, University of Latvia

LATVIJAS UNIVERSITATE
ANNO 1919
FBME Faculty of Business, Management and Economics

LIKTA
Latvian Information and Communications Technology Association

Eiropas Komisija

9th International Scientific Conference "New Challenges of Economic and Business Development – 2017: Digital Economy": Riga, Latvia, May 18-20, 2017. Proceedings. Riga: University of Latvia, 2017, 787 p.

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University of Latvia, 2017
ISBN 978-9934-18-286-0

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Abstract. In advanced economies, knowledge management and organizational learning are key assets for fostering innovation, long-term competitive advantage and sustainable development. And, while learning, knowledge creation, sharing and application depends on organizational infrastructure, those processes are also to large extent affected by socio-cultural factors – shared values, beliefs and attitudes – that shape individual and organizational behaviours, processes and practices. Cultural factors can be innovation enablers encouraging cooperation, teamwork and creativity, on the other hand excessively hierarchical or competitive cultures can work against innovation. Similarly, predominant organizational values and beliefs may promote or hinder capacity for creating, sharing, and applying knowledge.

The aim of this research paper is to analyse the role of cultural factors, knowledge management processes and organizational learning towards innovation performance. Respectively, it looks for knowledge management aspects and patterns of cultural traits that make organizations innovative.

A quantitative study of 112 small and medium-sized enterprises from various industries was conducted simultaneously in Latvia and Russia to assess organizational learning and knowledge management processes, socio-cultural factors, and innovation performance.

Our research reconfirmed that knowledge management statistically significantly increased innovation, and knowledge management and learning processes were closely related. Organizational learning had a positive impact on product, process and organizational innovation, while no statistically significant impact on marketing innovation. The research also confirms that stronger and more developed organizational culture lead to a better innovation performance. Finally, the results suggest that Latvian companies had significantly better performance on organizational learning in comparison to the Russian companies surveyed.

Key words: *innovation, knowledge management, learning, socio-cultural factors*

JEL code: M14, O31

Introduction

In advanced economies, knowledge management processes and organizational learning are key assets for fostering innovation, long-term competitive advantage and sustainable development. Traditionally international competitiveness depends on the available economic capital, human capital, natural resources, as well as on knowledge and technologies in post-industrial societies. Yet competitiveness is also affected by a group of factors that could be referred to as the socio-cultural factors (SCF) – shared values, norms and attitudes.

Culture is a complex phenomenon, which can be defined differently, depending on the field of science. Culture can be seen as a holistic concept that includes knowledge, belief, art, morals, law, customs, as well as other capabilities and

habits acquired by humans in social interactions (Tylor E., 1924 [1871]). Culture is also a dynamic system that, on the one hand, results from human action, and, on the other hand, conditions elements for further action (Kroeber A. and Kluckhohn C., 1952). And it is the *"collective programming of the mind, which distinguishes the members of one category of people from another."* (Hofstede G., 1984: 51). Culture is learned and specific to a group or society; it stands between the universal and inherited human nature and individual personalities (Hofstede G., Hofstede G.J. and Minkov M., 2010). Each culture consists of several layers, as everyone can belong to several different groups. In this paper, we focus on the organizational level.

Similarly to defining national cultures, Hofstede defined organizational culture as *"the collective programming of mind that distinguishes the members of one organization from others"* (Hofstede G., Hofstede G.J. and Minkov M., 2010: 344). Hofstede developed 6 dimensions of organizational culture – process oriented vs. results oriented, employee oriented vs. job oriented, parochial vs. professional, open systems vs. closed systems, loose vs. tight control and normative vs. pragmatic. The first dimension contrasts concern of means to concern of goals. The second dimension contrasts human concerns to job concerns. The third dimension compares, whether people get their identity largely from organization or from the type of job. The fourth dimension considers, how open if the particular organizational system to outsiders. The fifth dimension explains internal structuring. The sixth dimension considers customer orientation – whether the culture is more pragmatic – market driven, or normative – which concerns implementation of inviolable rules (Hofstede G., Hofstede G.J. and Minkov M., 2010).

At the same time, Hofstede emphasized the different nature of national and organizational cultures. National cultures are acquired early in childhood and include the most basic values, while organizational cultures are acquired by adults and consist primarily of organization's practices, thus are more superficial (Hofstede G., Hofstede G.J. and Minkov M., 2010). Such organizational practices – or customs, habits, mores traditions and usages – were recognized as part of culture already considering the aforementioned Taylor's definition.

Another definition of organizational culture was provided by Schein – according to him, organizational culture can be seen as a way, in which a certain group of people solves problems and makes choices (Schein E., 1985). Organizational cultures consist of several layers. The outer layer is made of artefacts and behaviours – it includes tangible elements and such features that could be easily understood externally. However, one must look behind any such directly observable artefacts to understand a culture. The middle layer includes espoused values, such as organization's stated values, shared visions and rules of behaviour – this level is the primary focus of our research. The third layer includes shared basic assumptions are the deeply embedded, usually unconscious behaviours. Basic assumptions constitute the essence of organizational culture; however, they are hard to recognize from within, thus hard to assess using structured questionnaires.

Previous studies have demonstrated the impact of cultural factors on entrepreneurship, influencing attitudes towards independence, risk and the distribution of power (Shane S., 1994; Tan J., 2002; Alvarez C. and Urbano D., 2012; Nougera M. et al., 2013). Culture affects productivity through shaping social decision-making process, increasing the ability to adjust to economic changes and forming attitudes towards social equality (Throsby C.D., 2001). Certain cultural values also impact effectiveness, productivity and welfare (House R. J. and Javidan M., 2002). Cultural values determine tightness and effectiveness of leadership (Aktas M. et al., 2015). Organizational culture can also play an important role fostering innovation, as long-term thinking, risk-taking abilities and individual responsibility increases innovation capacity (King W. R., 2007, Turró A. et al., 2014). It serves as a source of superior performance and sustained competitive advantage (Barney J. B., 1986).

Along with the cultural factors, we looked at organizational learning and knowledge management (KM) processes. Knowledge can be defined as *"a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information"* (Davenport T.H. and Prusak L., 1998: 5). The contribution that knowledge makes to innovation process in an advanced economy is broadly studied and generally beyond the scope of this paper; we can just agree that knowledge has become the resource that makes our society post-capitalist (Drucker P., 1993). With previous studies finding organizational culture as the most significant factor for effective KM (e.g., De Long D. W. and Fahey L., 2000), our primary interest here is to explore the relationship between the KM and cultural variables considering innovation.

The aim of this research paper is to analyse the role of cultural factors, KM processes and organizational learning on innovation performance. Respectively, it looks for KM and learning aspects and patterns of cultural traits that make organizations innovative.

Conceptual Background and Framework Development

To study the impact of organizational culture towards innovation in a quantitative manner, we structured culture along certain dimensions. In this paper, we have built the structure adopting the competing values framework, developed by Denison D. R. and Spreitzer G. M. (1991) aiming to explain company's efficiency. The competing values framework is based on dilemmas between stability and change, as well as between the internal and external environment. The frame is organized around two axes – centralization vs decentralization, as well as competition vs maintenance of the sociotechnical system (Denison D. R. and Spreitzer G. M., 1991). Four different forms of culture emerge from this framework – human relations model (the team), open systems model (the adhocracy), rational goal model (the firm) and internal process model (the hierarchy). To fit the model to our study, we refocused the internal process model from hierarchy to consistency.

In this paper, we define KM as the process of creating, sharing, using and managing the knowledge in an organization (Girard J. and Girard J., 2015), and in scope of our study we cover knowledge creation, sharing and management in form of knowledge updating. In our view, the aforementioned processes would be the most affected by cultural variables and would allow for enhanced analysis across different businesses and industries. KM can also be seen as an enabler of organizational learning (Sanchez R., 1996). Culture influences knowledge creation, shaping assumptions and relationships between individual and organizational knowledge (De Long D. W. and Fahey L., 2000). It can encourage sharing and integration through dialogues (Davenport T.H. and Prusak L., 1998). And organizational learning requires a high degree of commitment, where culture can provide basis for involvement and participation (Gupta B. et al, 2000).

Then we follow a holistic approach towards innovation, originally proposed by Schumpeter J. (1934), envisaging five forms of innovation – new products, new production methods, new markets, new supply sources and new forms of organization. Per this approach, some innovations can be considered as technical (new products and new production methods), while others – as non-technical. Schumpeter also distinguished between radical innovations as significant, fundamentally new developments and incremental innovations – continuous process developments. The Schumpeterian perspective is more inclined towards radical innovations and large, global changes. SMEs on average are not that likely to introduce and successfully commercialize globally new ideas, thus in this study we also consider incremental innovations and innovations that would already be present in the market, but would be new to the company.

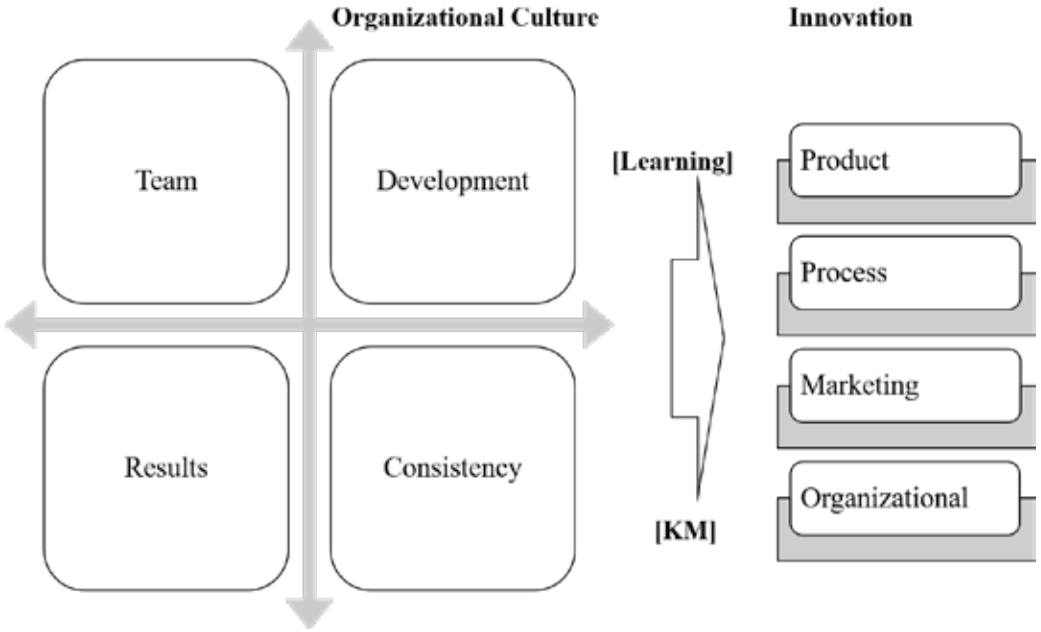
Drucker P. (1985) emphasized that innovation creates a resource, and that each invention becomes a resource just, when an organization finds and application for it. Drucker also argued that most innovative business ideas come from methodically analyzing seven areas of opportunity: four internal factors, including unexpected successes and failures,

process incongruities, process needs, and external factors - changes in industry and market structures, and industry and market changes, as well as three external factors - changes in demographics, changes in perception, and new knowledge.

A very comprehensive overview of innovation framework is provided in the Eurostat's and the Organization's for Economic Co-operation and Development (OECD-EUROSTAT, 2005) Oslo manual, which categorizes innovation into four main types: product, process, marketing and organizational innovations. Product innovations include introduction of a new or substantially better product. Process innovation includes new or significantly improved production or delivery method. Marketing innovations include new marketing methods, significant design or packaging changes, as well as product placement, promotion or pricing. Organizational innovations include new organizational methods in the company's business practices, workplace organization or external relations (OECD-EUROSTAT, 2005).

The firm's innovativeness as well as relations between innovativeness and performance or other attributes of the corporate culture, organizational structure, strategy, and organizational or individual competences have been investigated through quantitative surveys broadly presented in the literature (e.g., Souitaris V., 2002; Griese, I. et al., 2012). A few approaches on how to measure innovations were introduced. Becheikh N. et al. (2006) suggested that there are direct and indirect ways of measuring innovations. When the direct method is used, the number of introduced innovations are counted, e.g. new products, processes, marketing or organizational activities. When the indirect method is applied innovation, activities are measured implicitly, e.g. the number of patents or research and development investments. Both the approaches have their advantages as well as disadvantages. Some scholars (e.g., Read A., 2000) proposed to measure returns generated by innovation implemented, for instance returns generated by new products. This approach hardly can be used for all the types of non-technological innovations. In some studies, (García-Morale V.J. et al., 2006; Su Y.S. et al., 2009) different innovation activities are measured in comparison with similar activities of the competitors to allow to compare more the level of innovativeness demonstrated by each firm.

Based on the organizational culture, KM and innovation concepts described, we propose the following impact model (Fig. 1.):



Source: authors' model based on Denison and Spreitzer 1991 and the OECD – Eurostat Oslo manual for innovation 2005

Fig. 1. **The Model Explaining the Impact of Organizational Culture, KM and Learning on Innovation**

We developed a structured, closed-ended questionnaire for small and medium-sized enterprises. Most of the questions were adopted from previous studies. The main source of questions measuring independent variables of the impact model such as KM, knowledge development, organizational learning, team-building and result orientation were studies of Griese I. (2012) and Zortea-Johnston E. (2012). In addition, some of the questions were self-operationalized.

We developed the dependent variables measuring innovation performance based on the definitions in the Oslo Manual (OECD-EUROSTAT, 2005), as well as from other studies (Eurostat, 2012; Dadura A.M. and Lee T.R., 2011). Respondents were asked to compare the innovation performance of their company in comparison to the innovation performance of their competitors using a seven-point Likert scale (where 1 corresponds to ‘‘strongly disagree’’ and 7 corresponds to ‘‘strongly agree’’). Given that only meaning on the end-points was provided, we assume that SCF, KM and innovation variables are measured on a continuous scale.

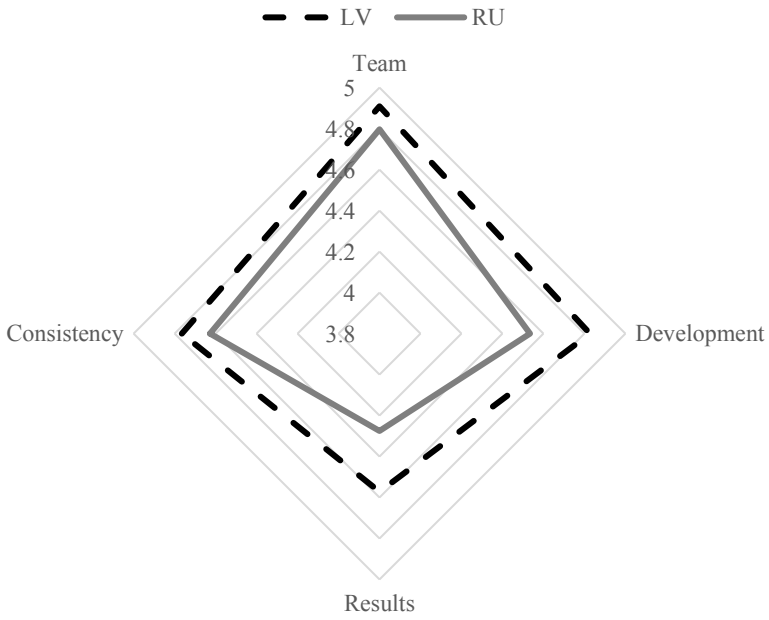
Few background questions were also included to understand the profile of organizations, such as annual turnover and dynamics, as well as the number of employees and the related changes. These variables were measured using a nominal scale. Due to the nature of the study, in this paper we follow the approach taken in the United States of America, and define small and medium-sized enterprises (SME’s) as businesses having no more than 500 employees. Such an approach allows to include more businesses in the analysis, while still distinguishing between medium-sized companies and large businesses, who might be industry leaders and thus might have different factors affecting innovation processes.

We distributed the questionnaire amongst senior managers of Latvian and Russian companies in the second half of 2016. Participants were selected using a “snowball” method. In total, 112 completed questionnaires were collected - 53 Latvian companies and 59 Russian companies from various industries took part in the research.

Research Results and Discussion

Per our results, companies had been working on average 5 to 20 years in their respective industries. Only 13% had worked less than 3 years, thus the companies were quite experienced in their respective industries. Almost 50% of the respondents had no more than 50 employees. And for most of the companies the number of employees had increased over last 3 years – 31.3% of respondents reported little increase, 11.6% - some increase and 17.9% significant increase of the number of employees. More than 50% of the respondents had the annual turnover over 100 000 EUR. Contrary to the employee dynamics, annual turnover had decreased for majority of respondents over last 3 years – 59% of respondents reported some decrease. It is somewhat surprising that the number of employees had on average increased, while the turnover decreased.

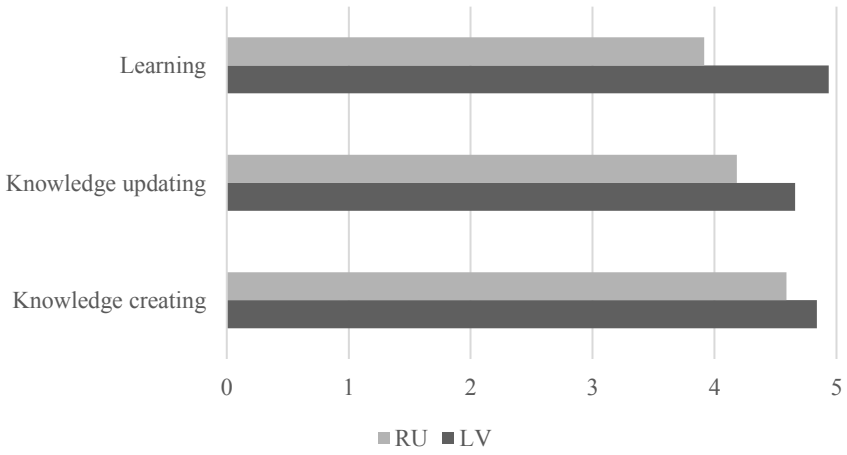
Analysing organizational culture, we could conclude that Latvian and Russian companies have a rather different profile. In both countries, the companies were more team and consistency oriented, however they had differences in orientation towards development and results (Fig 2).



Source: authors' calculations based on survey data

Fig. 2. **The Main Dimensions of Organizational Culture in Latvian and Russian Companies**

Looking at the KM - knowledge development and organizational learning indicators, we can also find differences between Latvian and Russian companies (Fig 3.).



Source: authors' calculations based on survey data

Fig. 3. **Knowledge Indicators in Latvian and Russian Companies**

Organizational learning differences are statistically significant, when tested with Independent samples t-test (Table 1). The differences are statistically significant for all three variables contributing to the organizational learning indicator – namely, seeing learning as an investment rather than expense, seeing learning as a necessity for organizational survival and participation in learning. These differences could mean that the business environment in Latvia is more entrepreneurial.

Table 1

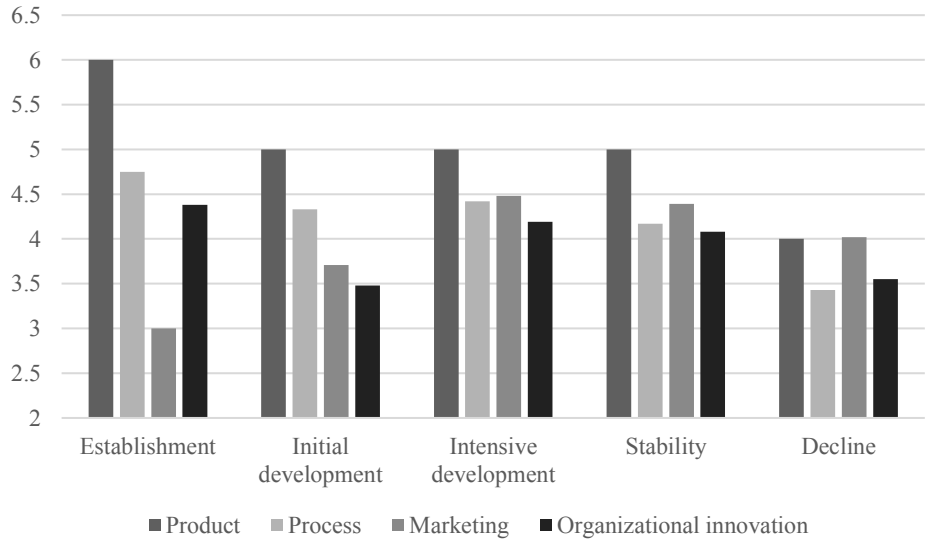
Independent Samples Test for Knowledge Indicators

	Equality of Variances		t-test for Equality of Means					
							Interval	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower
Creating	.475	.492	1.023	109	.308	.24911	.24341	-.23333
Updating	.092	.763	1.850	109	.067	.47647	.25750	-.03388
Learning	.032	.858	3.150	110	**.002**	1.02185	.32443	.37891

Levine's Test for Equality of Variances - equal variances assumed

Source: authors' calculations based on survey data

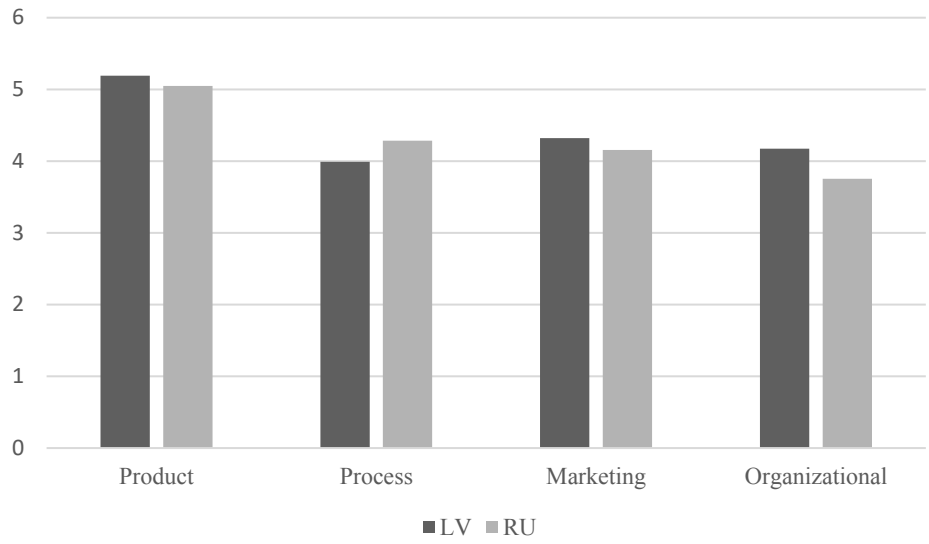
Finally, comparing innovation performance, we can conclude that product innovations were the most common amongst the respondents (rather on average 5.12 of 7), while organizational innovations were the least common (rated on average slightly below 4 of 7). Innovation performance was generally higher earlier in company's lifecycle – all forms of innovation were higher in establishment stage, except for marketing innovation, which increased by intensive development and stability (Fig. 4).



Source: authors' calculations based on survey data

Fig. 4. **Innovation Performance by Company's Lifecycle**

Latvian companies reported better results in organizational innovation, while Russian companies – in process innovation (Fig. 5):



Source: authors' calculations based on survey data

Fig. 5. **Innovation Performance in Latvian and Russian Companies**

One of the explanations could be that we had more industrial companies in the Russian sample. And for these companies process innovations might have been more essential, as they operate in manufacturing sector. While we had more service companies in the Latvian sample, for whom marketing and organizational innovations might have been more important than process innovations.

Analysing the relationship between organizational culture, knowledge indicators and innovation performance, we used the Pearson correlation coefficient. This coefficient can take a range of values from +1 to -1; a value of 0 indicates that there is no association between the two variables. A value greater than 0 indicates a positive association, and a value less than 0 indicates a negative association. Statistically significant correlations are displayed in the Table 2.

Table 2

Association between organizational culture, knowledge indicators and innovation performance

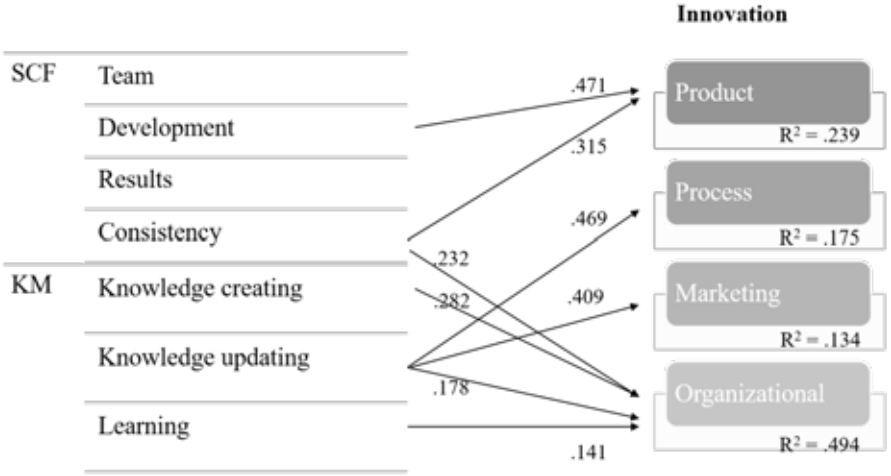
	Innovation			
	Product	**Process**	**Marketing**	**Organizational**
Culture	.363**	.249*		.393**
Team	.427**	.320**	.238*	.543**
Development	.300**	.330**	.276**	.516**
Results	.339**	.318**	.271**	.436**
Consistency	.363**	.249*		.393**
Knowledge				
Creating	.247**	.268**	.289*	.529**
Updating	.318**	.425**	.371**	.563**
Learning	.203*	.243*		.551**

***statistically significant at the 0.01 level *statistically significant at the 0.05 level*

Source: authors' calculations based on survey data, only statistically significant correlations included

We can conclude that moderate to weak relation exists between culture factors and knowledge indicators from one side and innovation performance form the other side. This association is weaker for marketing innovation and stronger for organizational innovation.

To further analyse the impact of the SCF and knowledge indicators on innovation, we develop a liner regression model. Four dimensions of organizational culture – namely, orientation towards team, development, results or consistency, as well as three knowledge indicators – knowledge creating, updating as well as organizational learning are considered as the input values in this model. Product, process, marketing and organizational innovations are considered as the dependent variables. We use a stepwise method with input variable selection criteria probability-of-F-to-enter <= .050, probability-of-F-to-remove >= .100, to consider just the significant factors in each model. Following this approach development and consistency are included in the regression model explaining product innovation. Knowledge updating is included in the regression models measuring process and marketing innovations. Finally, knowledge updating and organizational learning are included in the model explaining organizational innovations. These relationships are summarized in Fig 6.



Source: authors' calculations based on survey data

Fig. 6 **Influencing Factors of Regression Models Explaining Innovation**

Summary of regression models, including the selected input factors and based on the highest adjusted R^2 are summarized in Table 3.

Table 3

Summary of Regression Models Explaining Innovation

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
Product	.489[b]	.239	.224	1.425	.056	7.547	1	102	.007	1.945
Process	.419[a]	.175	.167	1.37177	.175	21.032	1	99	.000	2.160
Marketing	.366a	.134	.126	1.39489	.134	15.642	1	101	.000	1.966
Organizational	.703[d]	.494	.473	.90294	.046	8.763	1	96	.004	2.060

Source: authors' calculations based on survey data, only selected model summaries based on the highest R square

The marketing model is not very strong; however, the ANOVA analysis confirms that all four models explain dependent variable significantly well.

Conclusions, Proposals, Recommendations

In our study, we considered small and medium-sized enterprises in Latvia and Russia. The results provided evidence that:

1. Knowledge indicators, organizational learning and organizational culture are closely linked; a more developed organizational culture leads to more enhanced KM processes and higher organizational learning;
2. Latvian companies reported a significantly better performance in organizational learning as their Russian counterparts, thus one could assume that Latvian business environment could be more entrepreneurial;
3. Innovation performance was generally higher earlier in the company's lifecycle, expect for marketing innovation, where performance increased as the company matured;
4. From the literature review, we can conclude that innovation activity depends on various factors in each company, and that different types of companies have different priorities towards innovation. Introduction of innovation could be based on knowledge processes and organizational culture. On the other hand, there could be a certain number of sup-types of non-technological innovation;
5. Knowledge indicators and organizational culture could partly explain all forms of innovation, however the relation was the strongest with organizational innovation;
6. Both Latvian and Russian companies had the best performance in product innovations. Both – LV and RU companies had the best performance in product innovation. Latvian companies reported better results in organizational innovation, while Russian companies – in process innovation;

Based on the study, we propose creating trusting environment and using tools for information sharing at all organizational levels for creating and maintaining innovation boosting organizational culture.

For further studies we would, firstly, recommend to assess the differences between Latvian and Russian companies in a more qualitative way. Secondly, it would be valuable to further assess KM indicators and the interaction between them. Thirdly, the current study is limited to Latvia and Russia, it would be valuable to include more companies from different countries in the sample. And, finally, it would be interesting to compare the results amongst different industries and between SMEs and large companies in the given countries to find out, why there is such a performance difference in certain types of innovation.

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ORGANIZATIONAL INNOVATIONS AND KNOWLEDGE MANAGEMENT: IN SEARCH FOR A THEORETICAL FRAMEWORK

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Abstract. Organizational innovations are an important prerequisite for an enterprise to become or stay competitive. For innovations to take place, it is necessary to understand what it takes to innovate. One of the components, which is necessary, is knowledge. However, it is not enough to just have the knowledge, the right approach has to be found for the knowledge to be useful, thus in this paper authors are examining the theoretical framework of knowledge management and organizational innovations.

Knowledge management is a systematic management of an organization's knowledge assets for the purpose of creating value, meeting tactical & strategic requirements and fostering innovations in an organization. However, most of the enterprises do not pay enough attention to using the available knowledge to gain the greatest effect. Right now scholars have different approaches which explain knowledge management and its processes. Also there are many key questions to be answered to understand the real necessity of knowledge management, for example, how to promote a culture conducive to learning, sharing, and knowledge creation, how to make the right knowledge available to the right people at the right time etc. The purpose of this paper is to propose literature review for understanding the theoretical framework of organizational innovations and knowledge management by examining the current researches done by scholars in order to create new theoretical framework for further empiric analysis. The research implications may serve as an incentive to companies to develop their organizational knowledge management to foster further innovations.

Key words: *innovations, knowledge management, theoretical framework*

JEL code: O15, D83

Introduction

Innovation is fundamental to the process of organizational creation. (Van de Ven, 1999) Organizational innovations began to receive attention from researchers because of importance of surviving in the competitive and dynamic environments as well as because of its contribution to the development of other types of innovation, such as product, service or process innovations (Hamel, 2006, Lam, 2005). Nowadays, competition is one of the main driving factors, which force managers and researchers to look for the best approaches for the organization to operate. Ability of an organization to be innovative and to innovate lies in the basis of usage and adoption of new resources, technologies. One of the basic resources to innovate is knowledge. However, knowledge itself is not enough for the innovation in an organization to take place. Thus, the right approach of knowledge management is a great prerequisite for an efficient innovation process.

This paper aims to compile the available scientific resources to create a theoretical understanding of organizational innovations and knowledge management and to set first steps to make a bridge to fill the gap between two terms as well as to set a background for further studies. This study builds on the extant literature to propose hypothesis about if knowledge directly and indirectly affects innovation.

The research implications may serve as an incentive to companies to develop their organizational knowledge management to foster further innovations. The results can help researchers to better understand the link between organizational innovations and knowledge management. They could use the results for further studies to create measurement system and indicators.

The topicality can be found in the fact that both terms – organizational innovations and knowledge management have been widely researched in the past two decades with an emphasis on the latest years, which means that this is a topical subject for a research since more and more research questions have been appearing.

The information sources used in this article are scientific – all of the sources are taken from scientific journals which can be found through Emerald database.

The paper begins with overview on organizational innovations and its dimensions. Second section provides outline of knowledge management, both parts has been looked at from the field of already existing literature. In the end conclusions and directions for future research directions are provided.

Research Results and Discussion

Organizational Innovations

Till the beginning of 21st century definition of the term organizational innovation had different interpretations. Despite the fact that organizations face challenges when they implement new management practices or other innovation, the topic of organizational innovation has never been central in either organizational or management theory and research (Daft, 1989, Hall, 1991, Scott, 1992).

Organizational innovations comprise changes in the structure and processes of an organization due to implementing new managerial and working concepts and practices, such as the implementation of teamwork in production, supply chain management or quality-management systems (OECD, 2005; Damanpour, 1988). Complexity of organizational innovations can very, they could affect a certain business process (e.g. delivery of the product), or whole organization (management systems). (Hage,1998, 1999)

There were different interpretations of the term itself and the lack of a widely accepted definition caused difficulties in designing and implementing measures and indicators that sustain validity over a wide coverage (Lam, 2005). Woodman et al. (1993) defined organizational innovation as the creation of valuable and useful new products/services within an organizational context. Since most organizations engage in innovative activity as a competitive weapon, we adopt a market-oriented approach and enhance this definition to include the returns due to innovation.

OECD (2004) first described organizational innovations as “the successful bringing of the new product or service to the market.” But recently an organizational innovation is defined according to OECD (1996) as “…a new organizational method in the firm’s business practices, workplace organization or external relations. Organizational innovations can be intended to increase a firm’s performance by reducing administrative costs or transaction costs, improving workplace satisfaction (and thus labor productivity), gaining access to non-tradable assets (such as non-codified external knowledge) or reducing cost of supplies.”

Lam (2004) classified organizational innovations into three different streams, recognizing that these strands have empirical overlaps but they were theoretically distinct to the level that they hindered the process of developing a clear view of „organizational innovation and interrelations between its different dimensions.:

I. First dimension focuses on the link between the structure of organization and its way to implement innovations. Scholars like Mintzberg (1979) and Teece (1998) aimed to determine the effects of organizational structural variables on product and process innovation.

On the Table 1 connection between the structure of an organization and its innovative potential can be seen, developed by Mintzberg (1979) and Lam (2005).

Table 1

Mintzberg's structural archetypes and their innovative potentials

Organizational archetype	Key features	Innovative potential
Simple structure	Centrally controlled by one person but can respond quickly to changes;	Entrepreneurial and often highly innovative, continually searching for high-risk environments. Weaknesses are the vulnerability to individual misjudgment and resource limits on growth.
Machine bureaucracy	A mechanistic organization, high level of specialization, standardization and centralized control.	A continuous effort to routinize tasks through formalization of worker skills and experiences. Designed for efficiency and stability. Good at dealing with routine problems, highly rigid and unable to cope with novelty and change.
Professional bureaucracy	A decentralized mechanistic form which accords a high degree of autonomy to individual professionals. Individual and functional specialization, with a concentration of power and status in the 'authorized experts'.	Difficulties of coordination across functions and disciplines impose severe limits on the innovative capability of the organization as a whole.
Divisionalized form	A decentralized organic form in which quasi-autonomous entities are loosely coupled together by a central administrative structure. Typically associated with larger organizations designed to meet local environmental challenges.	An ability to concentrate on developing competency in specific niches. Weaknesses include the 'centrifugal pull' away from central R&D towards local efforts, and competition between divisions which inhibit knowledge sharing.
Adhocracy	A highly flexible project-based organization designed to deal with instability and complexity. Problem-solving teams can be rapidly reconfigured in response to external changes and market demands. Typical examples are professional partnerships and software engineering firms.	Capable of fast learning and unlearning; highly adaptive and innovative. However, the unstable structure is prone to short life, and may be driven over time toward the bureaucracy.

Sources: compiled from Mintzberg (1979); Lam (2004).

II. The second dimension focuses on micro- level process how the organization creates and develops knowledge for innovative activities. Emphasizing the learning and organizational knowledge creation process, this camp of research investigated innovation capabilities of organizations depending on the firm's capacity to create and exploit new knowledge.

III. The third dimension focuses on idea of adaption and creation of new organizational forms in case of radical changes and environmental shifts.

Teece (1994) distinguishes two main types of innovation, namely "autonomous" and "systemic" innovation. An autonomous innovation does not require massive modification of related products and processes. On the other hand the need for systemic innovations arises from complex interactions between many individuals, organizations and their operating environment. Systems are changing fast. Companies which are successful in realizing the full returns from their technologies and innovations are able to match their technological developments with complementary expertise in other areas of their business, such as enterprise-wide business process management, manufacturing, distribution, human resources, marketing, and customer service. But it is obviously seen in recent research findings that systemic innovations diffuse slowly in the organizations (Kaivo-oja, 2011).

According to Hamel (2009), an organizational innovation creates long-term competitive advantages if it meets one or more of three conditions:

1) "The innovation is based on a novel principle that challenges management orthodoxy;
2) It is systematic, encompassing a range of processes and methods;
3) It is part of an ongoing program of invention, where progress compounds over time".

This would mean that the organizational innovation needs to be systemic, despite the outcome of findings that are showing lack of usage of systemic organizational innovations in the companies around the world, in order to create competitive advantages long-term. Further, the organizational innovation is preferably part of a larger program of inventions.

Knowledge Management and Its Role in Organizational Innovations

Most knowledge-based companies recognize knowledge and social capital as the base of building competitive advantages in a company. The trends are changing rapidly and the markets in most of the fields are quite saturated with a wide range of different products, which means that innovation is necessary for the company to stay attractive for their potential and current customers. Thus, knowledge management and innovations is an inseparable duo to build competitive advantages in a company – the innovations must be continuous and knowledge management must be well-planned (Popadiuk, Choo, 2006).

As stated in the available scientific literature, knowledge can be described as "a special type of a resource in an organization which increases as it is used as opposed to other resources" and humans are the main carriers of knowledge (Brajer-Marczak, 2016). According to a researcher E. Skrzypek (2012), knowledge, skills, abilities and experience form competences, which are necessary for the company to be able to operate and thus to innovate. Knowledge is valuable, rare, inimitable and non-substitutable and is context-specific (Afiouni, 2009). A part of it is codifiable (Explicit knowledge) and most of it is not codifiable (Tacit knowledge) (Nonaka, Takeuchi, 1995). In fact, knowledge management plays an essential role in innovation through diverse means like facilitating collaboration, assisting in tacit knowledge transformation into explicit knowledge, identifying knowledge gaps and ensuring that knowledge is accessible and available (Du Plessis, 2007). Explicit knowledge can be expressed in numbers and words and shared in a very touchable

form, for example, the form of data, scientific formulas, specifications and manuals (Nonaka, 1998). While to explain tacit knowledge - there are two dimensions. The first is the technical dimension, which contains informal personal skills often referred to as "know how". The second is cognitive dimension. It consists of beliefs, ideals, values and mental models, which are deeply integrated in one's personality (Žemaitis, 2014).

The concept of knowledge management (KM) is an interdisciplinary term and its definitions refer to information technologies, human resource management or financial aspects related to intellectual capital (Brajer-Marczak R, 2016). There are numerous definitions of KM, for instance, knowledge management is any processes related to creating, acquiring, and separating, exchanging and utilizing knowledge in order to increase efficiency, effectiveness and the ability to learn in an organization (Davenport, 1998). While Pillania (2006) describes it as follows - KM is a systematic, organized, explicit and deliberate ongoing process of creating, disseminating, applying, renewing and updating the knowledge for achieving organizational objectives. It is believed that it is crucial for organizations to embrace KM as a tool for providing a sustainable competitive advantage irrespective of the size, sector or industry type (Mageswari, Sivasubramanian, Dath, 2015).

KM can be divided into several different processes, which differ from author to author. For instance, one of the approaches shown by scholars is as follows – KM can be viewed as a process comprising of knowledge creation, knowledge acquisition, knowledge application, knowledge transfer or sharing and many more. For example, some scholars add knowledge development and knowledge retention (Mohamed, Stankosky, Murray, 2006, Khalil, Claudio, Seliem, 2006). Scholars Nonaka and Takeuchi define knowledge creation as the ability of an organization to create and expand new knowledge and to group it to products, systems and services in the organization as a whole, providing their continuous improvement (Nonata, Takeuchi, 1997). The *acquisition* of knowledge happens when organizations obtain information and thus knowledge from external sources such as relationship with customers, competing companies, partners in cooperative ventures and suppliers. Knowledge *development* is an element that completes the acquisition of knowledge, and it works as a base of new skills, new products, improved ideas and more efficient processes in an organization aimed at producing skills that have not been present in the organization yet, therefore non-existent inside and outside. The *sharing and distribution* of knowledge are ways to transform individual knowledge into certain information, which the organization as a whole can benefit from, which means that each and every worker is literally a valuable resource for the organization. Further, when that particular knowledge is applied in a beneficial way by the organization, the *use* of knowledge occurs. Knowledge *retention* will depend on the efficiency of the use of knowledge *storage* by the organization (Bueno, John, Lyra, Lenzi, 2016). Knowledge sharing and knowledge acquisition are the most frequently studied knowledge management process by empirical papers, considering the relationship with innovation. This is an interesting result considering that most theoretical papers on knowledge management emphasize the role of knowledge creation process and application for innovation. However, this fact shows that the concern of the current research is about external search and organizational networks to broaden and deepen the organizational knowledge base, as well as the need for human interaction for ideation and innovation purposes. Nevertheless, strengthening the knowledge base through external acquisition and/or internal knowledge creation provides a potential for innovation activities and outcomes (Costa, 2016).

Knowledge management in theory has been recently widely researched; many dimensions and models have been offered by scholars. One of those models claims that implementing a good process of knowledge management may not be as simple as it may look, since it must be altered to at least 6 dimensions – strategy, organizational culture, organizational processes, management &leadership, technology and politics. Knowledge management must be incorporated into corporate strategy, which means that the objective of the organization itself must be to manage, share and create relevant knowledge assets that would further help to meet tactical and strategic goals of the organization. The

organizational culture influence how people act and interact in an organization, thus it should be one of the values of the organizational culture to create, share and manage knowledge. In terms of organizational processes, knowledge management should be fostered by creating an appropriate environment and systems (for example, qualification raising system) to foster the processes of KM. Also, in larger organizations it may even be necessary to have a leader or manager to organize KM processes. In terms of technology, the systems, tools and technologies used in everyday work should be properly designed, implemented and used. The political dimension means that in the long-term the most important thing is to support initiatives which have appeared to make the KM processes better and more efficient even if these initiatives do not have a directly visible return on investment. However, this is only one opportunity to describe the dimensions of KM. Scholar Garcia-Fernandez offers a compilation of theoretical dimensions and empirical dimensions (Garcia-Fernandez, 2015). Some examples are given in the Tables 2 and 3.

Table 2

Compilation of theoretical dimensions by Garcia-Fernandez, 2015

	Studies	**Theoretical dimensions**
Knowledge creation	Nonaka & Takeuchi (1995)	Socialization, externalization, combination, internalization (the same dimensions have been offered in the context of knowledge transfer and storage)
	Slater & Narver (1995)	Acquisition of information, information dissemination, shared interpretation
	Chiva and Camiso (2003)	Experimentation, new ideas, continuous improvement, rewards, openness to change, observation, openness and interaction with the environment, acceptance of error and risk, heterogeneity, diversity, dialogue, communication and social construction, training, delegation and participation, teamwork, importance of, the group, collective spirit, collaboration, workers wanting to, learn, committed leadership, organizational and management, structure and hierarchical bit flexible, knowledge of organizational objectives and strategies, and information, accessibility, sense of humor, improvisation and creativity
Application and use useuse of knowledge	Garvin (1993)	Solving problem systematically, experimentation, learning from past experience, learning from others, transfer of knowledge
	Slater and Narver (1995)	Entrepreneurship, market orientation, organic structure, facilitative leadership, decentralized strategic planning

Source: compiled from Garcia-Fernandez (2015)

As it is possible to notice, scholars have a wide and differentiated point of view on the theoretical dimensions of knowledge management processes like knowledge creation and knowledge application and use. For example, Garvin (2013) sees knowledge application and use as a process, which consists of solving problem systematically, experimentation, learning from the past experiences, learning from others and transfer of knowledge, which are actions more inside the organization and can be used on daily basis. Meanwhile Slater and Narver (1995) see the value of

application and use of knowledge in more external and strategic actions. However, it is possible to conclude that although scholars name the dimensions differently, the main idea stays quite similar throughout the different approaches.

Table 3

Compilation of empirical dimensions by Garcia-Fernandez, 2015

	Studies	**Empirical Dimensions**
Knowledge creation	Goh and Richards	Clarity of purpose and mission, leadership commitment and empowerment, experimentation and rewards, transfer of knowledge, teamwork and group problem-solving
	Balbastre (2001)	Accumulation of experience, knowledge articulation and codification of knowledge
	Martinez and Ruiz (2004)	Learning capability, organizational structure, organizational culture
Knowledge transfer	Molina et al. (2007)	Internal knowledge, suppliers knowledge and customers knowledge
Application and use of	Hult and Ferell (1997)	Information acquisition, information dissemination, customer orientation, participative openness, reflective openness, centralization, formalization

Source: compiled from Garcia-Fernandez (2015)

Similarly it is with the empirical dimensions of knowledge management process. However, there are elements which appear only in work of some scholars and meanwhile are undoubtedly crucial. One of those elements, for example, is organizational culture. In authors' opinion organizational culture is a system of shared assumptions, values, and beliefs, which governs how people behave in organizations. These shared values have a strong influence on the people in the organization and dictate not only how they dress at their workplace, but also how they perceive the necessity and importance of knowledge management processes in an organization.

Conclusions

Authors have come to conclusions about interaction between organizational innovations and knowledge management.

1. Combining the two terms "organization" and "innovation" is complex, but that is undeniably a process that is very important for the long term run. Organizational innovations have different effects on performance indicators (human resource management inside the organization, team work, supply chain management etc.), thus nowadays it is without a doubt a must have.
2. The key role in process management is played by the systematic analysis, measurement and improvement of processes, which is also referable to the process of organizational innovations and knowledge management.

Viewing organizational innovation from the theoretical point of view is a challenge not only because the definitions are quite dissimilar, but also because there is a lack of studies, where organizational innovations as a term is in the core of the research. Thus, it is possible to recommend carrying out further researches in the field of organizational innovations.

3. Knowledge management is essentially about getting the right knowledge to the right person at the right time. Thus, knowledge management implies a strong tie to organizational goals and strategy and creates value for the organization.
4. The results show that during the research authors have proved the hypothesis that all knowledge processes not only can directly and undoubtedly support innovation but also that other organizational variables (e.g. organizational learning, absorptive capacity) mediate this relationship, thus it might be an interesting topic for further research to determine the impact of each variable on innovation process.

Proposals and Recommendations

It has been proposed:

1. It is suggested to carry out further studies to examine more thoroughly factors that may influence implementation of organizational innovation, as well as possible connection between implementation of organizational innovations and productivity.
2. It must be mentioned that although there are already numerous papers about knowledge management and innovations, the rapidly changing global environment does not let the research to stop, since new viewpoints are still emerging. As well as it is worth to understand that such studies have been made about to different topics, but scholars have not look at the topic combining two term. That is why it is suggested to develop research with statistic data to see the correlation between organizational innovations and knowledge management.
3. For the further studies it is advisable to examine interaction between knowledge management and productivity of the enterprise.

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ANALYSIS OF ENTREPRENEURIAL ECOSYSTEM FRAMEWORKS: THE NEED TO QUANTIFY ENTREPRENEURIAL ACTIVITY

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Abstract. It is commonly accepted that entrepreneurship is a key activity in the current economic context, and entrepreneurs create value in form of new business ventures, and generate new jobs by mobilizing economic resources, which in combination has a positive impact in terms of increasing productivity and economic growth, among other positive effects. To this respect, international institutions like the United Nations or the Organization for Economic Cooperation and Development agree on the importance of innovation and entrepreneurship in sustainable economic growth and material and non-material welfare. In this context the concept of entrepreneurial ecosystem arises to illustrate the impact of framework conditions, such as public policies, culture or access to finance, to promote or disincentive the entrepreneurship initiative in a given location.

Although the interaction of entrepreneurship and economic development has become a hot topic in the agenda of policy-makers and private investors, traditionally there has been a lack of understanding in this particular field, mainly due to the absence of a framework that gathers and quantifies the agents and its relationships as a necessary step to measure and evaluate the different inputs and outputs of the entrepreneurship performance in a certain region/city. Therefore, academic research on the entrepreneurship field has been mainly focused on the individual entrepreneurs concept, underestimating (i) the complexity of the interactions among different agents in each stage of the entrepreneurial process, and (ii) their evolution over time to evaluate the entrepreneurial outcome in a certain region.

Given the need to progress to more quantitative approaches of the ecosystem's activity, the objective of the paper is to present a comparison of the most relevant frameworks that represent entrepreneurial ecosystems in order to identify the existing gaps to quantify entrepreneurial activity, and reflect on the efforts that could contribute to evaluate and monitor its progress.

Entrepreneurship being a central part of the policy agenda in Europe, and in particular the notion of the app economy or web entrepreneurship among key entrepreneurship policy cornerstones for the EU, the paper can contribute to the debate in order to design improved frameworks to establish entrepreneurial ecosystems in specific locations (e.g. cities) as a way to foster economic and social development through entrepreneurship and innovation.

Key words: *entrepreneurship, entrepreneurial ecosystems, public policy, startups.*

JEL code: L26

Introduction

It is commonly accepted that entrepreneurship is a key activity in an economic context aimed at renewed and innovation-based growth (Ács, Autio, and Szerb, 2014; Acs et al., 2012)(Audretsch, Bönte, and Keilbach, 2008). In fact entrepreneurs create value in the form of new businesses ventures and generate new jobs by mobilizing economic resources, which in combination has a positive impact in terms of increasing productivity and economic growth (IEG

World Bank, 2013). To this regard, international institutions like the United Nations (United Nations University, 2011) or the Organization for Economic Cooperation and Development (OECD, 2013) agreed on the importance of innovation and entrepreneurship in sustainable economic growth and material and non-material general society welfare. Some authors have gone even further noting that 21st century has implied a paradigm shift from the "managed economy", based on large-scale and standardized production into the "entrepreneurial economy", in which knowledge and innovation are the dominant elements (Thurik, 2009)(Audretsch & Thurik, 2004).

Despite of this practical relevance, there is still a lack of a unique conceptual framework for entrepreneurship. Two main relevant issues have been highlighted to this regard: the absence of a comprehensive and unanimous definition of the topic (Shane & Venkataraman, 2000); and being addressed by scholars from diverse disciplines such as psychology, anthropology, social sciences, and, obviously, economics and management studies, all using diverging perspectives (Carlsson et al., 2013). From the authors' point of view there are two additional difficulties that should be highlighted.

The first is the almost exclusive focus on the individual –the person or group of persons who starts an entrepreneurial activity- but not in the relationships weaved around the entrepreneur and the process to discover, evaluate and explode these relationships. The second is the absence of an explicit consideration of the time dimension in the entrepreneurial activity.

With regard to those two elements of entrepreneurship, lately the role of the environment –the ecosystem- where the entrepreneurial activity takes place has gained momentum, as the conditions to foster innovation activities in connection with post-crisis recovery have acquired a prominent role in many political agendas (Warwick, 2013). However less is known about the evolution over time of the relationships among different players that take place within the entrepreneurial environment and how this evolution affects the chances for development and success of entrepreneurial activities. Furthermore, although the interaction of entrepreneurship and economic development has become a hot topic in the agenda of policy-makers and private investors, traditionally there has been a lack of understanding in this particular field, mainly due to the absence of a framework that gathers and quantifies the agents and its relationships as a necessary step to measure and evaluate the different inputs and outputs of the entrepreneurship performance in a certain region/city.

Aligned with these reflections around the increasing demand to progress to more quantitative approaches of the ecosystem's performance, the objective of the present paper is to identify relevant research gaps that still need to be addressed in order to quantify entrepreneurial activity.

Delimiting The Notion of Entrepreneurial Ecosystem

The dynamic nature of entrepreneurship, this is the influence of the time dimension in entrepreneurship, has been present from its very inception. The French economist Richard Cantillon -the first academic who used the concept- already considered entrepreneurship as the process of bearing the risk of buying something at a certain price in a certain moment, and selling it at uncertain moment in the future (Cantillon, 1755). Although other important economists dealt with entrepreneurship –Jean-Batiste Say, John Stuart Mill and Frank Knight among others- it was Joseph Schumpeter (Schumpeter, 1934) which recovered the dynamic perspective when he considered the innovation role of the entrepreneur and its influence in economic development as opposed to classical static equilibrium. Later he remarked the disruptive –and dynamic- function of the entrepreneur in the economy: "*creative destruction is the essential fact about capitalism*" (Schumpeter, 1942). From here the dynamic nature was acknowledged in the Austrian School where economists like Von Mises (Von Mises, 1949) strongly based their concept of entrepreneurship on the premise that markets tend continuously toward the equilibrium and the role of the entrepreneur as an "arbitrageur" matching the supply and the demand (Kirzner, 1973).

The Schumpeterian notion of dynamic innovation as a key feature of the entrepreneurial activity has directly influenced further research works, in particular the searching and exploitation of opportunities (Drucker, 1985)(Gartner, 1988), leading to consider that innovation –a dynamic process- is the essential characteristic of the entrepreneur (Baumol, 1996)(Acs et al., 2012). According to this logic, this paper follows the OECD-Eurostat Entrepreneurship Indicators Programme (EIP) definition of entrepreneurial activity (Ahmad & Hoffmann, 2008) as the "*human action in pursuit of the generation of value, through the creation or expansion of economic activity, by identifying and exploiting new products, processes or markets*". As a summary, from the authors' perspective the combination over time of value generation, innovation and risk taking are the required features for entrepreneurship.

The influence of the framework conditions on innovation, lately labelled as "ecosystem environment" or simply "ecosystem", derives from business models network theories where it is considered that the success of a company is not only linked to their own strength but also to the relations with the rest of companies of the network (Hakansson & Snehota, 1995). According to this theory, these relationships can improve the performance of an entire set of companies in a given situation. James Moore was one of the first authors using the concept of ecosystem in business management (Moore, 1993). Moore outlined that companies could not be viewed as a member of a single industry but as part of an ecosystem where customer needs are fulfilled by the cooperative and competitive interaction among companies belonging to different sectors. Later, Moore went deeper into the definition of business ecosystem reinforcing the essential role of evolving interaction among individuals and organizations in the performance of the companies and the ecosystem itself (Moore, 1996). After Moore, the influence of business ecosystems on companies´ health have been broadly developed in the field of strategic management, including the development of conceptual frameworks to assess the situation of a company (Iansiti & Levien, 2004). Other models consider that relationships are not limited to related companies and include every other economically relevant entity (Gordijn, Akkermans, & Vliet, 2000). Broader approaches consider that the ecosystem is formed by interacting "players", including companies and institutions that provide knowledge, resources and set 'rules of the game' that evolve over time (Fransman, 2014).

According to the literature review conducted, the specific concept of entrepreneurial ecosystem can be considered as relatively new, being a natural consequence of the theory of economic ecosystems as explained above, together with that of entrepreneurship. In fact, a historical development can be traced back to different frameworks such as industrial clusters (Baptista, 1998), national innovation systems (Lundvall, 1992)(Nelson, 1993)(Freeman, 1995), or regional innovation systems (Cooke, Uranga, & Etxebarria, 1997)(Asheim & Isaksen, 2002), all of them antecedents of the entrepreneurial ecosystem approach. These models share the focus on the importance of agglomeration and geographical placement but they underestimate or neglect the relevance of the dynamic interdependence among different components present in the framework.

Entrepreneurship Ecosystem Concept and Frameworks

The first mentions of the term "entrepreneurial ecosystem" appear in the work of scholars such as Boyd Cohen (Cohen, 2006) or Mariano Bernardez (Bernardez, 2009). However it only gained popularity after Daniel Isenberg's article "How to Start an Entrepreneurial Revolution?" (Isenberg, 2010). In that article, Isenberg defined the entrepreneurship ecosystem as a set of individual elements that appropriately combined and nurtured can result in a successful milieu for innovation. The most relevant contribution from the authors' perspective was the acknowledgment of both comprehensive strategies and local conditions. Since then, the entrepreneurial ecosystem is an increasingly widespread concept and a number of academic papers have defined and referred to the concept, see among others Edward Malecki (Malecki, 2011), Mason and Brown (Mason & Brown, 2014), Peter Vogel (Vogel, 2013), Erik Stam (Stam, 2014), and Acs, Estrin et al (Acs, Z.,

Estrin, S. Mickiewicz, T., & Szerb, L., 2014). The concept has been also received remarkable contributions by practitioners as Brad Feld (Feld, 2012), or international institutions such as the World Economic Forum (World Economic Forum, 2014a). In this context (Spigel, 2015) defines entrepreneurial ecosystems as 'combinations of social, political, economic, and cultural elements within a region that support the development and growth of innovative startups and encourage nascent entrepreneurs and other actors to take the risks of starting, funding, and otherwise assisting high-risk ventures'.

In this context the specific concept of "entrepreneurial ecosystem" arises fundamentally to illustrate the impact of framework conditions, such as public policies, culture or access to finance, to promote or disincentive innovative risky initiatives in a given place and time (Isenberg, 2010).

Table 1

Selection of some of the most relevant ecosystem frameworks

Framework	Description
Babson College - Babson Entrepreneurship Ecosystem Project (BEEP)	An ecosystem as a dozen of elements gathered in six domains that interact in complex ways. It provides high-level definition of relevant agents/elements per domain and permits the representation of any geographical level, but do not provide specific indicators.
Organisation Economic Co-operation and Development (OECD) – Entrepreneurship Measurement Framework	The concept of ecosystem as the combination of three factors (opportunities, human capital, and resources, affected by two transversal themes (culture and regulation). This is gathered in six key determinants. It is conceived at national level and provides a range of indicators (comparability).
The Global Entrepreneurship and Development Institute (GEDI Institute) - Global Entrepreneurship and Development Index	Based on theory of National System of Innovation, it is focused on the relevance of institutional frameworks and the key role of institutions. It is an index of indexes that allows comparability at national level.
World Economic Forum (WEF) – Entrepreneurial ecosystem pillars	Focus on the enablers of entrepreneurial success from a theoretical point of view, categorizing four main areas (personal, financial, business, environmental), and eight pillars, without specifying geographical level.
Council of Competitiveness (CoC) - Asset Mapping Roadmap	Noted eight categories to promote economic development at local/regional level, with focus on the role of networks.
World Bank - Doing Business project:	It provides objective measures of business regulations for local firms in 189 economies and selected cities at the subnational level.

Source: author's own elaboration

As shown in the previous table, the rising interest on entrepreneurial ecosystems has been accompanied by a number of characterization and evaluative frameworks provided by institutions very different in nature. Among different studies, the Aspen Network of Development Entrepreneurs (ANDE, 2013) elaborated one of the most comprehensive reviews about these frameworks. ANDE published in 2013 a methodological guide conceived with the aim of supporting the labour of practitioners in charge of assessing the entrepreneurial ecosystem in developing areas. Before its completion, ANDE conducted an effective comparative study of nine evaluative frameworks from a broad range of scopes, including educational and research institutions (Babson College, George Mason University), international organizations (World Bank, Organisation Economic Co-operation and Development –OECD-) and institutions (World Economic Forum),

private firms (Koltai and Company), associations (Council on Competitiveness, GSM Association) and even practitioner approaches (Victor Hwan) (ANDE, 2013).

Therefore, the entrepreneurship ecosystem approach emerged as a representation to address the gap of a comprehensive framework that gathers and quantifies the agents and its relationships as a necessary step to measure and evaluate the different inputs and outputs of the entrepreneurship performance in a certain place (Zacharakis, Shepherd, & Coombs, 2003)(Neck et al., 2004). Taking into account that the performance of the entrepreneur depends on their interaction with many different factors and the recognized influence of local aspects on entrepreneurial performance (Feldman, 2001)(Lee, Florida, & Acs, 2004), the concept "entrepreneurial ecosystem" includes cultural aspects and agents (individuals, firms, organizations, and governments), among other relevant elements, and combine and influence the evolution of entrepreneurs and their firms in a single area. Thus, as a main instance, the OCDE definition of the entrepreneurial ecosystem includes a set of interconnected actors (both potential and existing), organizations, institutions, and processes which formally and informally coalesce to connect, mediate, and govern the performance within the local entrepreneurial environment (Mason, Colin, & Brown 2014).

Entrepreneurial Ecosystems Frameworks Evolution: From Qualitative To Quantitative Representation

Those presented frameworks involve a large effort of conceptualization and suppose a comprehensive representation of the context in which entrepreneurship is developed in a certain area. However, many questions arise from this formal representation that illustrate the demand for a deeper understanding: Are all ecosystems similar? Do they have the entire range of domains or can reach equilibrium with some missing elements? How each domain impact in the entrepreneurial activity development? How agents in the ecosystem interact? Is always the role of the involved actors played in the same domain? What is the role of the location of the ecosystem? How do ecosystems evolve over time?

To this respect and from the different frameworks previously shown, much of the discussion of entrepreneurial ecosystems has lacked a time dimension (Mason & Brown, 2014) (Stam, 2014), as they allow understanding the high level structure but do not provide for example a model to observe and characterize the role of agents and their contribution to the ecosystem over time. Therefore from the authors' perspective, the descriptive function of all previous frameworks should be complemented with additional metadata that illustrate and quantify agents' dynamics.

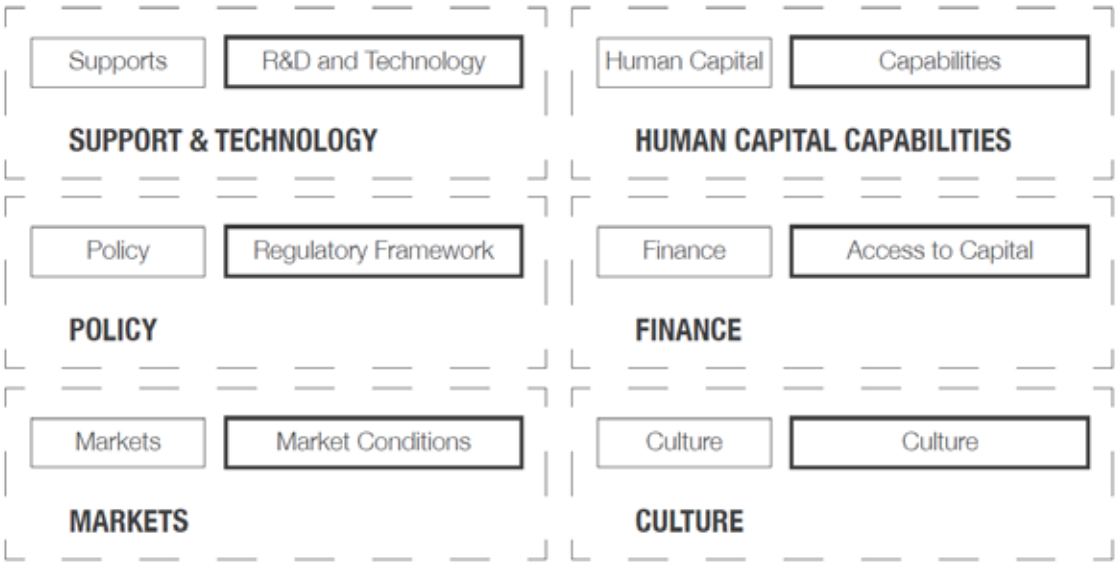
Following this idea, the challenge of quantifying an ecosystem, according to the literature review presented, seems to be far from being solved. In this sense, the definition of metrics could be seen as the result of previous efforts to consolidate the way an entrepreneurial ecosystem is characterized. Precisely this paper attempts to offer a first reflection of those identified topics by researchers and practitioners, as presented before, in order to depict a potential path to guide future efforts that could improve the understanding of entrepreneurial ecosystems based on both qualitative and quantitative data. Those topics are summarised in the following sub-sections.

1. A common framework adoption to start with the conceptualization of ecosystems as a dynamic evolution of agents that interact, cooperate and compete in a given place.

It is commonly accepted that the departing point for the research on entrepreneurial ecosystems is based on the models proposed by Daniel Isenberg and the Babson College in its "The Babson Entrepreneurship Ecosystem Project (BEEP) " and also on the framework developed by the OECD's Statistics Directorate within the context of the OECD-Eurostat Entrepreneurship Indicators Programme (EIP)(Ahmad & Hoffmann, 2008; OECD, 2008). The model suggested by BEEP outlined six domains (policy, finance, culture, supports, human capital and markets) that include twelve elements (Leadership, Government, Financial Capital, Success Stories, Societal norms, Non-Government intuitions, Support

professions, Infrastructure, Educational institutions, Labour, Networks, Early Customers). In the case of EIP-OECD it aims to assess policy makers and to create a consistent and comparable database of entrepreneurship indicators. The OECD framework considers three linked aspects when evaluating an entrepreneurial ecosystem: entrepreneurship determinants, those factors that affect the entrepreneurial performance in the ecosystem, which are classified in six themes (access to capital, R&D & technology, entrepreneurial capabilities, market conditions, regulatory framework and culture); the entrepreneurial performance, the status of the entrepreneurship in the considered area; and the impacts, the ultimate value created on the economy of the area derived by entrepreneurial activities.

Examining both BEEP and EIP frameworks, it is possible to identify an almost direct equivalence between BEEP domains and the EIP determinants. It is obvious that these categorizations are not exactly the same but it is also true that conceptually both models are relatively similar and could be the departure for a common framework that eases dynamic studies. As an example to guide future research and discussions both approaches have been merged in a common framework as depicted in Fig. 1.



Source: author's own elaboration

Fig. 1. **Common framework for the entrepreneurial ecosystem based on the models of BEEP (fine border) and EIP (thick border)**

From the authors' perspective a common framework would help researchers and practitioners to focus on more specific issues connected to the activity and performance of agents, an establish solid grounds to conduct long term studies that could be comparable through the use of similar concepts and indicators when studying particular ecosystems.

2. The startup as a central actor that evolves along a path of growth through different stages that take place in one or more ecosystems.

Together with the adoption of a common framework it is essential to agree on, at least to a certain extent, which are the central agents in every ecosystem.

In this sense, a coherent step further with current policy objectives for entrepreneurship to create jobs and wealth (EC, 2016) is to place the startup as the central element of a given ecosystem, considering the widely accepted definition proposed by Steve Blank "*a startup is a "temporary organization designed to search for a repeatable and scalable business*" (Blank, 2010). The scalability can be considered as the main factor that defines a startup, the objective of

growing in a short period of time, in an attempt to reach momentum and scale-up, which would in turn create the pursued positive socioeconomic impact.

With this anchor in mind, the representation of an entrepreneurial ecosystem can be considered as combination of agents, attached to one or more domains of a framework, that contribute to the creation, nurturing and growth of startups, offering them the necessary resources and support in each stage of development. Therefore, together with the startup, the identification and characterization of those agents participating in the ecosystem is a relevant topic for research, in particular the way the agents relate to the startup along its evolution and how resources (labour, knowledge, capital, …) are allocated and interchanged. To this respect, the European Parliament (EP, 2017) acknowledges this dynamic interaction as it considers that "*an entrepreneurial ecosystem is a resource allocation system that drives the allocation of resources towards productive uses through innovative and high-growth new businesses. This implies that the primary activity of an entrepreneurial ecosystem is to facilitate the creation of new businesses, but the ultimate outcome is the resource allocation dynamic*".

In this sense, from the analysis of the different domains (and the activities included in each of them) that are proposed in both the OECD and the Babson College frameworks it is possible to draft a first set of actors, as presented in figure 4.

Source: author's own elaboration

Fig. 2. **Common framework for the entrepreneurial ecosystem based on the models of BEEP (fine border) and EIP (thick border)**

3. The evolution of relationships along the startup lifecycle among the startup and the rest of agents that form the ecosystem.

As mentioned before, the dynamic nature of ecosystems is a key topic of interest given the lack of the time dimension in the current existing frameworks. Precisely this time dimension is directly linked to the natural process of evolution of every entrepreneurial venture and the way the startup, considered as a central agent of the ecosystem, build relations with other ecosystem agents that evolve over time.

In this context, one of the issues to be addressed is how approaching to a dynamic representation of the ecosystem linked to the phases of the maturing process of innovative ventures and, consequently, to the evolution of their needs. Therefore it is necessary first to acknowledge the phases through which a startup evolves.

There are a large number of classifications of the stages in the startup evolution. For example, the Global Entrepreneurship Institute proposes a roadmap called the Entrepreneurial Life Cycle that includes seven stages: Opportunity recognition, Opportunity Focusing, Commitment of Resources, Market Entry, Full Launch and Growth, Maturity and Expansion and Liquidity Event. In the same sense, Paul Graham establishes three phases of a successful startup from the side of the growth patterns (Graham, 2012): (i) initial period to figure out their product with no growth, (ii) rapid growth reaching customers and (iii) the transformation into a big company where the growth is slow due to the limits of the market it serves.

Among them, a commonly accepted model is the Life Cycle Model of Entrepreneurship proposed by the World Economic Forum (WEF 2014b), as it offers a top-level representation from the idea stage to the internationalization phase that allows further refinement in sub-phases:

- Stand-up: entrepreneurship is an option. In this phase "potential-entrepreneurs" can choose to start a business or another options (work as an employee, continue studying, etc).
- Start-up: the decision of start a business is taken. It is necessary to set up the start-up, get funds and launch the product.
- Scale-up: once the startup has resulted viable, the step is to grow up and proceed to internationalization.

In summary, considering the need for a consolidated framework that defines common boundaries to identify domains and agents, assuming the central role of startups within the ecosystem, and their natural dynamic towards growth, from the authors' perspective there is a gap to better understand the relationships that are established among agents, and the way they shape the evolution of the startup along its Life Cycle (no matter the stages considered).

This approach would contribute to understand particular contexts, identify for example the relevant actors in each place/location, the domains in which their role is played, to quantify their weight, and to obtain comparable results that help the understanding of different kind of ecosystems, their evolution and possible combinations.

4. Quantifying entrepreneurial activity and reflect on the indicators that could contribute to evaluate and monitor its progress.

As mentioned before the link between frameworks, agents and relationships that evolve over time needs to be represented with a proper selection of variables to measure entrepreneurial ecosystems. As presented by The Kauffman Foundation (Bell- Masterson & Stangler, 2015), in some cases these variables represent inputs of the ecosystem, while others are outputs. Although they may all be important, they should have a different weighting and be used for different purposes in the decision-making process. Given the current economic context and the deep interest in entrepreneurship that guides the efforts to build entrepreneurial ecosystems, it's only natural to wonder what outcomes should be tracked.

To this respect, the ecosystem metrics should be connected to the goals to be achieved, ranging from just increasing the number of entrepreneurs or companies, focusing on specific niches of activity, marketing a region as a place to grow a business, or changing the economic and social dynamics. There are also different levels of measurement for entrepreneurial ecosystems, from its overall performance in terms of macroeconomics indicators to the specific measurement indicators to monitor the activity of particular agents, organizations, or domains.

From the authors' perspective a holistic approach to ecosystem measurement should consider the selection of the key pursued objectives to nurture and consolidate the ecosystem, the identification of elements that constitute it, linking them to an ideal representation (indicators) of what are the magnitudes to be measured, and finally connecting the corresponding magnitudes and sources of data (if any) or those closer and available to the ideal representation. Therefore and considering the previous reflections, the current debate of entrepreneurial activity measurement can be seen as a balance between,

availability, comparability and representativeness of data. These drivers are linked to the level of detail that can be reached in the analysis of a certain ecosystem, ranging from high-level country domain to specific neighbourhood or city level.

In this sense, current research activity focuses on some the following approaches (or their combination) when analysing an entrepreneurial ecosystem from a quantitative perspective:

- **Set of indicators definition and comparison**. Following the approach of the analysis of ecosystem components described (e.g. Babson or OECD Framework) the most well-known example of a common set of indicators is the proposal of the Eurostat-OECD Entrepreneurship Indicator Programme (EIP), created in 2007. This framework is the result of an active collaboration of national and supranational statics institutes to collect internationally comparable data to enable entrepreneurial measurement. The result a list of 18 indicators, classified in 3 main dimensions (Enterprises, Employment and Wealth) to compare entrepreneurship activity at country level. However and despite the efforts made so far, there are few indicators that can be collected in all European countries, and some others are not fully available as they are mostly voluntary for national statistics institutes (for example those indicators related to high growth and high growth young enterprises -gazelles- data collections).

  This kind of approaches is suitable for country level analysis as it offers a high-degree of comparability and availability, at least in a number of countries, although the results cannot be seen as a full representation of the entrepreneurial activity in a country, but just a picture of the general climate of activity as a set of aggregated figures.

- **Composite entrepreneurship indicators**. The selection of a common and comparable set of indicators represented by statistical values does not always catch the inner dynamics of entrepreneurship (relationship among agents, stages of development). According to (Avanzini, 2009) "Existing indicators of entrepreneurial activity (suchas Global Entrepreneurship Monitor, Entrepreneurship Barometer, FORAs Entrepreneurship Index, OECD and Eurostat indicators, among other) and several variables that have been considered good proxies for entrepreneurship during last decades seem to be not so adequate to capture the complex relationship between economic, social, and demographic factors driving entrepreneurial development". Acknowledging that entrepreneurship is a complex phenomenon, its measurement by means of a lonely indicator seems to be limited, using a set of them instead as a more solid alternative. However, given the criteria to select indicators are not always objective, the alternative of using a scoreboard made of many relevant sources of information (available or desirable) that are combined to build composite indicators offers an interesting alternative. To this respect, composite indicators constitute suitable tools for exploring less-known phenomena, and for benchmarking performances (Saisana and Tarantola, 2002). These indicators are built by tipically using any of the techniques based on Principal Component Analysis.

- **Performance indicators at regional or city level**. Given the importance of the geographical dimension of a certain ecosystem, regions and cities are appropriate to study entrepreneurship performance as startups are started locally and therefore immersed in local context. According to (Szerb et al, 2013) the specific location of the ecosystem influences it through a combination of formal and informal rules and culture, demand trends, human capital, networks, talent, and knowledge. As a relevant example, the link between economic performance and entrepreneurship at regional or city level is studied by (Audretsch et al, 2015), concluding "the immediate economic development impact of startups is positive for both small-/medium-size cities and large cities". The measurement approach is based on the usage of indicators and variables that represents the value added and economic development in cities, with a sufficient amount of time series data and lags. This approach typically uses a lower number of indicators and sources information but add more detail and granularity on the analysis, although comparison among regions or cities can be difficult depending of the availability of data. Other authors (Garcia et al, 2016) suggest the adoption of specific frameworks of reference, like those from ISO (being a well-known example the ISO 37120 Sustainable development

of communities - Indicators for city services and quality of life), which can be of application in a large number of comparable cases. However the heterogeneous availability of data is a critical barrier still to be addressed.

- **Ad-hoc indicators**. Finally, and opposite to top-down approaches (set of indicators, composite indicators) the bottom-up approach of measuring entrepreneurship from an empirical set of measures is gaining momentum, in particular to study and compare activity at city level. The problem with this approach for (Avanzini, 2009) is that the chosen measures are those based on the most readily available statistics, and only rarely authors attempt to justify or explain how the measures represent entrepreneurship. As a relevant example, the Dynamic Mapping of Startup Hubs presents and analyses a range of data related to startup businesses and in doing so seeks to provide a detailed and consistent analysis of 20 startup ecosystem across Europe (European Commission, 2017).

Conclusions

The concept of entrepreneurial ecosystems summarizes a complex network of agents and relationships among them that represent the existing conditions of a certain area to develop entrepreneurial activities and the way the entire set works and performs. Therefore entrepreneurial ecosystems can also be considered a convention to represent the previously mentioned relationships, rules, interests, agents, etc.

Given the success of specific cities and areas where innovation takes place (e.g. Silicon Valley, Boulder, Boston, London, NYC, Tel-Aviv, etc.), many others sustain that it is possible to replicate those models to foster innovation and entrepreneurship in other places. This practice, widely extended on a policy making level, usually not only disregards the fact that every ecosystem is different, but also lacks a deep understanding of the entrepreneurial ecosystem concept prior to making decisions and investing efforts.

Moreover, from the public policy perspective it is essential to first identify the specific problems to tackle when setting the conditions to foster entrepreneurship, and as a consequence the corresponding remedies in form of action plans to address them. However, there are a limited number of structured studies on what an entrepreneurial ecosystem is and how its constituent elements can be influenced to target specific outputs. In this context, we believe that a deeper understanding of the entrepreneurial ecosystems dynamics would have an enormous impact on improving global output from entrepreneurial activities.

For all these reasons the need for further research in this field is analysed along this paper, selecting specific areas of interest that would ease a connection between descriptive representations to quantitative analysis of entrepreneurial activity. As a summary, the following concluding remarks can be highlighted:

- Entrepreneurship ecosystems frameworks have provided a comprehensive view to consider the “context” as a key determinant for entrepreneurial activity.
- Research has been mainly focused on the definition of taxonomies of domains and stakeholders involved in the entrepreneurial process, but less is studied about the evolutionary nature of entrepreneurial activity and how ecosystems are created and evolved.
- There is an opportunity to enrich these frameworks with a focus on the way entrepreneurs and startups relate to the ecosystem along the startup cycle.
- Metrics are essential in order to quantify efforts, monitor progress, and measure and compare results.

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LEARNING SYSTEM AS A FACTOR TO FACILITATE THE BUSINESS PROCESS EFFECTIVENESS IN ENTERPRISES

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Abstract. The vast availability of information and communication technologies is offers various opportunities for enterprises to ensure high efficiency for their business processes. It is achieved by intensive usage of communication tools and formalized process's workflows that are integrated with technological solutions. Even for small and medium-sized enterprises that has a high necessity for agility in their business processes, the cloud technologies can provide ubiquitous availability and flexibility. However, an efficient business process is not always effective. It is not enough to perform tasks in an optimal way, a successful enterprise must do the right activities in the most optimal way. The responsibility to make the right decision in the right time is placed on employee's shoulders. The aim of the research was to ascertain how e-learning may facilitate business process effectiveness in small and medium-sized enterprises and to identify the descriptive requirements that are specific for small and medium-sized enterprises.

The research was based on the analysis of small and medium-sized enterprise's characteristics, such as business process agility, high turnover rate, high bus factor and horizontal enterprise structure. As a result, it was found out that the key knowledge of enterprise business processes is dissipated and unorganized. The key finding of the research is a set of the requirements to which the e-learning solution must comply in order to satisfy the needs of small and medium-sized enterprises. E-learning solution can serve as an enterprise's knowledge database that is accessible at any place with the Internet connection on any device at any convenient time, and its content can be used up-to-date for enterprise's needs. It is considered that using a corresponding e-learning solution the enterprise will put in order its knowledge management and improve competence of employees that will promote the enterprise's growth. The recommendation for further studies is to validate the findings a by field experiment using either an existing solution or a prototype that include the defined set of requirements.

Key words: *effectiveness, e-learning, SME, knowledge management*.

JEL code: D83 D23

Introduction

The effectiveness of business processes in any enterprise is the key factor for enterprise's success. To ensure this effectiveness the enterprises apply different kind of strategies, reorganising the structure of enterprise, integrating new technologies and ensuring that employees work hard. Nevertheless, every enterprise has a different success rate ensuring business process effectiveness (Mouzas, S., 2006). Based on theories such as "Learning organization" and "Life-long learning" the nature of effective business process emerges: it is not enough to perform activities in an optimal way, the effective business process must perform the right activities in the most optimal way. Thus, the enterprise's business processes must not only be efficient but also effective. The key requirement for every effective activity is appropriate competence level of employee, as the responsibility to make the right decision in the right time is placed on employee's shoulders (Gareth Goh, 2013).

To ensure the rise of employees' competence level, an enterprise can develop the policy combining classical training methods with the usage of e-learning and the usage of knowledge management system. As every enterprise possess unique knowledge the usage of knowledge management system in the enterprise can preserve and ensure the development of enterprise's knowledge. The usage of e-learning system can be viewed as a learning system on premises to ensure better guidance for unique enterprise's knowledge objects and as an e-learning abroad to ensure remote training for generic competence improvement. The market has high availability of varied learning and knowledge management system with different functionalities and wide range of price level, to ensure the coverage for all enterprise sizes and business requirements, and there is hardly left a place for improvements.

If the role of learning and knowledge management is so important and has high impact on enterprise performance, then the question is why there are still enterprises that are not using learning and knowledge management system? The research has been performed indicating that the failure rate of knowledge management system is 50%, and the number may be even higher if failure is defined as the situation in which the system is adapted but it does not reach the expectations (Akhavan, P., Jafari, M. & Fathian, M., 2005) There is also a substantial research carried out to analyse the fails of knowledge management system in enterprises of any size taking into account the historical development of knowledge management (Frost, A., 2014). The important part of knowledge management system failures in the enterprise is employees' resistance to knowledge management systems (Jia Li, Minghui Liu, Xuan Liu, 2016).

The scope of current research is limited to small and medium-sized enterprises as the adoption of knowledge management systems is low and the possibilities of knowledge management systems is not fully exploited. (Cerchione, R., Esposito, E., Spadaro, M.R., 2015) As well as the small and medium-sized enterprises have specific characteristics that influence knowledge management system adoption process.

The aim of the research is to define the generic business requirements of small and medium-sized enterprises that will improve the adoption level of learning solution, as well as to propose a model that will cover the defined business requirements. The research process has been divided in three parts:

- the failing factors of knowledge management system adoption;
- characteristics of small and medium-sized enterprises;
- business requirement definition and a proposed model of combined learning system solution.

The Failing Factors of Knowledge Management System Adoption

By addressing the topic of knowledge management system failing factors, it is desirable to define what knowledge management system is. The term is elusive and there is more than one definition, yet the most appropriate definition for the research's aim is the one describing the main functional goals of the system and it has been introduced by Marc Resnik (Resnik, M., 2002):

"Knowledge management requires five stages of manipulation, corresponding to the capture, storage, interpretation, dissemination, and auditing of intrinsic and extrinsic information for the purpose of improving company performance."

By investigating the failing factors, the results of a number of researches have been processed by gathering 66 failure factors for knowledge management system adoption in the different kind of organizations (Akhavan, P., Pezeshkan, A., 2014), (Frost, A., 2014), (Weber, R.O., 2007), (Jia Li, Minghui Liu, Xuan Liu, 2016), (Nunes, M.B., Annansingh, F., Eaglestone, B., Wakefield, R., 2005), (Malhotra, Y., 2004). These failing factors were analyzed and consolidated by identifying three fundamentally unsolvable problems:

- insufficient employees' motivation;

- information's constant ageing;
- the need to access the right information at the right time (accessibility).

The problem of motivation can be described as social attitude towards the knowledge management system. Motivation is influenced by an enterprise's employee acceptance and understanding of the system. If there is a lack of support from the top management, the resistance from employees, or the adopted system with its functionality does not meet the requirements of enterprise's business processes, the motivation level tend to be low and the knowledge management system sooner or later can meet its decline. Even if the first motivation level is high, when the first hype is over the problems of the systems become evident and the acceptance and usage dwindles.

As information is always ageing, in order to ensure up-to-date knowledge content it must be continuously maintained and updated. In large enterprises, it can be achieved by assembling the knowledge management team, who has responsibility to maintain the content up-dated on knowledge management system. But in small and medium-sized enterprises, if there is a knowledge management support team, knowledge management support function usually is not a primary duty of these employees. Therefore, in small and medium-sized enterprises the content of knowledge management system is more exposed for aging problem. As the result, the content management functionality of knowledge management systems for small and medium-sized enterprises must be as supportive as possible, even to the level of automatic content update or suggestive content update. The users of knowledge management system need to receive notifications and warnings on aged information, and if the content has an external data source it needs to be updated automatically or on demand.

Considering the concept that has widespread usage in different fields as "Just in Time", the need to access the right information at the right time is as important for small and medium-sized enterprises as it is for large enterprises as well. This requirement is important, because there is too much content and information, and an employee has to find the proper one. The accessibility can be improved by the means of proper knowledge content management, advanced knowledge system search engine, and enterprise or user context aware solution.

To increase the success rate of knowledge management system all three problems must be addressed as they are interrelated and complementary to each other.

Characteristics of Small and Medium-sized Enterprises

Although learning is essential for all kind of enterprises, the current research was performed within the scope of small and medium-sized enterprises. Small and medium-sized enterprises have specific characteristics by which these companies must be viewed differently compared to large enterprises (Floyde, A., Lawson, G., Shalloe, S., Eastgate, R., D'Cruz, M., 2013). Within the research project "Agile Usage of Agile Paradigm in Support Business Processes of Small and Medium-sized Enterprises" (Datorzinibu centrs, Riga Technical University, 2017) the characteristics of small and medium-sized enterprises has been analysed and the result of this research is used within the context of enterprise's knowledge management. (Table 1)

Table 1

Characteristics of small and medium-sized enterprise

Group	Attribute
Management	Owner places the manager
	Less knowledge of management
	Less group decisions
	Less Planning

Group	Attribute
Organization	Manager is supreme leading
	Less development of units
	Direct and short ways of information
	High flexibility
Production	Intensive working
	Less division of labor
	Universal machines
	Refinement of processes instead of regular replacements
Financing	Family owned business
	Limited capacity (compared to large enterprises)
	No individual or governmental support in times of crisis
	Not only interested in maximizing the profit, but rather want to lead the business over several generations
Personnel	Small number of employees
	Few academics as employees
	Few unskilled employees
	Widespread expertise (universal employees)
	Personal relations between employees
	High "bus factor" (unique competences)

Source: table based on data on (Datorzinibu centrs, Riga Technical University, 2017).

Some characteristics of small and medium-sized enterprise have greater impact on usage of knowledge management system in the enterprise such as: "Less knowledge of management", "Direct and short ways of information", "Intensive working", "Less division of labor", "Small number of employees", "Widespread expertise", "High "bus factor"". Usage of knowledge management system can facilitate the knowledge management within an enterprise and reduce the negative effect of high "bus factor" indicator (this indicator shows up together with the indicator of "Small number of employees"). It is possible to reduce the workload and thus decrease the indicator of "Intensive work" (in case if the effectiveness is increased). Such indicators as "Direct and short ways of information", "Less division of labor", "Small number of employees" and "Widespread expertise" have to be taken into account when choosing the most appropriate knowledge management system so that the system supports the getting of information as quickly as it would be by means of direct way of getting information. It is advisable not to pile information into one set of information but to provide it into several fields of enterprise' activities so that employees can have more specific sets of information.

1. Business Requirements and Proposed Solution

By addressing the usage of knowledge management system from employee's point of view the statement is rather simple. Employee has been given a task within the limited timeframe. While performing this task the logical question emerges "How to?" (Fig. 1.). The employee may not have any knowledge on the given task or has incomplete knowledge. Employee might want to consider to search for more optimal way or might forgotten some specifics to accomplish the given task properly. While searching for the answer there are several ways how an employee can receive the necessary knowledge:

- using the knowledge of the others (colleagues or superiors);

- trying to search in the enterprise documentation (use knowledge management system if available);
- or using the Internet search engine.

Nowadays, the popularity of using internet search engines for acquiring the necessary information by means of asking the right question is very high. By taking into account that small and medium-sized enterprises has a "Widespread expertise", the employee can acquire the necessary knowledge by asking the right question and filter the necessary information. Of course, there is a lot of useless information, but employees very quickly gain the skills for effectively filtering out a useful information and applying it. Although the usage of Internet search engine can provide content that has low aging and high availability, but it does not have enterprise context awareness.

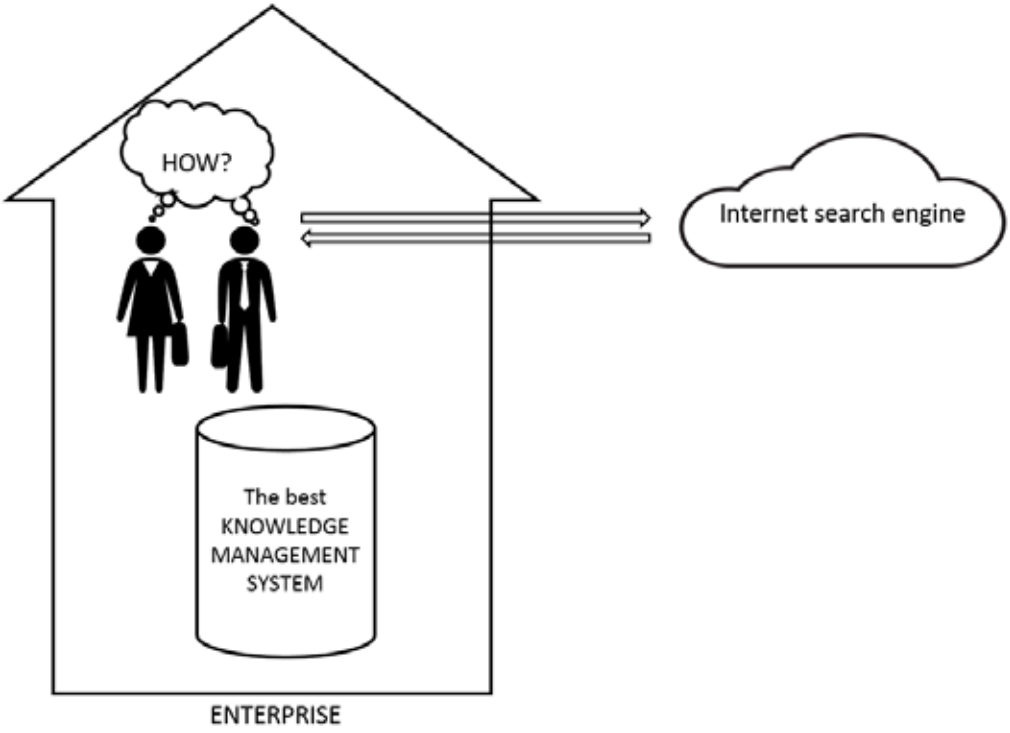

Fig. 1. **Employee's point of view**

As the result, an employee is gaining the necessary knowledge in the Internet search engine and does not seek the guidance from knowledge management system. It does not matter that enterprise has the best knowledge management system, if it is not used then usefulness of knowledge management system rapidly decreases.

The latest trends in field of learning in enterprises is fusion of knowledge management and e-learning concepts. There are researches that proves that e-learning is becoming as a tool for knowledge management (Khademi, M., Kabir, H., Haghshenas, M., 2011), in others knowledge management system becoming as a platform for e-Learning (Judrups, J., 2015). By combing these concepts the strong aspects of e-learning system such as training and guidance can be reinforced by strengths of knowledge management such as creation, storage, and transfer of knowledge. As the result, the learning system can provide employees with more complete support for achieving higher level of competence.

In addition to the previously mentioned models of knowledge management and e-learning integration, the integration of search engine usage into learning solution is proposed (Zhang, L., Sridharan, B., Kinshuk, 2003). The architecture of this solution is integration with search engine, for example, Google, Bing, or Yahoo. The proposed solution encapsulates the search engine's result and combines it with the content and the context of enterprise's knowledge database on premises. This states that search engine integration within enterprise's learning solution combined with the enterprise's policy

adjustments can provide higher success rate of learning systems in the enterprises. That leads for higher employee work efficiency and effectiveness.

The proposed business requirements for learning solution:

- Learning solution shall have "single point of entry" for knowledge search process;
- Knowledge search process shall combine local knowledge data base search results with internet search engine's returned results;
- Combined search results shall be processed in compliance with the enterprise's policy ensuring the enterprise's context awareness;
- While providing employee with search results, learning system shall perform passive evaluation and caching of search results;
- Learning solution shall provide employees with the possibility to perform active evaluation, changing, and sharing of the search results.

Enterprise has to ensure the usage of learning solution, thus a "single point of entry" approach is proposed. Employees are allowed to use the internet search engine as they please, but is has to be done through learning system interface. The search result provided by the Internet search engine may be the same as provided by the search in learning system on premises database. The combination process of search results should group similar search results by its content. While employee perform search by some keywords, the meaning of these keywords may differ within the context of the domain of enterprise. It is more likely that employee is searching within the context of enterprise domain, and search result order can be augmented accordingly. Another aspect of applying enterprises policy on combined search result is the usefulness of search results. By adding passive and active evaluation, the model can evaluate the importance of search result within the context of the enterprise. For example, if employee often uses one or another learning material that means this learning material is more valuable for enterprise. And if employee has actively approved or shared the learning material is has even more useful within the context of the enterprise.

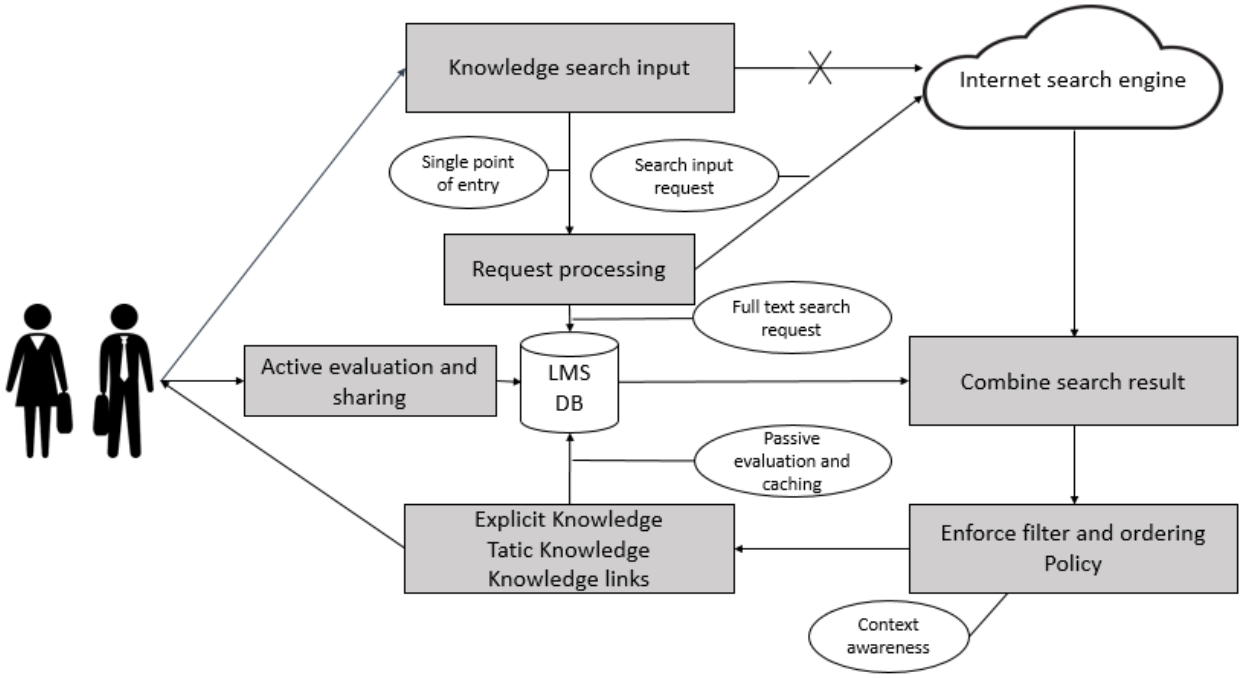

Fig. 2. **Learning solution model**

The proposed combination of learning solution (Fig. 2.) consists of integration of knowledge management system, e-Learning system, and Internet search engine. This model best operational outcomes are expected if the enterprise has also implemented the policy that regulates the usage of native internet search engine. The crucial functionality of the model is one entry point for accessing local knowledge management system, e-Learning system, and Internet search engine at the enterprise.

Conclusions, Proposals, Recommendations

While finding a way how e-learning may facilitate business process effectiveness in small and medium-sized enterprises the several research tasks have been performed. Firstly, based on theoretical acknowledgement the enterprise employee competence's direct coherence with enterprise effectiveness was considered. Secondly, the results of previous researches were combined with the results of this research leading to identification of three fundamentally unsolvable problems: employee motivation, information aging, and information accessibility. And thirdly, combined learning system model has been developed and proposed to overcome the problem of widespread usage of internet search engines that overshadows the learning system on premises. As a result of the research, the list of learning system business requirements has been defined, and schematic model has been created.

The suggestions for future research are to validate the business requirements within the small and medium-sized enterprises in the local market using survey. If the result of survey will confirm the theoretically assessed business requirements then the prototype should be created.

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ISSUES OF LABOUR MARKET DEVELOPMENT IN LATVIA AND EU COUNTRIES

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Abstract. The aim of the paper is analyse labour market flows, "Europe 2020" strategy employment targets and some issues of labour market policy in the EU countries and in Latvia particularly. In the given research, methods are the analysis of the literature and advanced papers in the field of labour market were used. Methodology is based on Eurostat labour market flow statistics.

According to the labour market flows, there are four country groups: 1. countries with relatively low unemployment and high transition into employment; 2. countries with relatively low unemployment and low transitions into employment; 3. countries with relatively high unemployment and high transition into employment, and 4. countries with relatively high unemployment and low transition into employment.

Improvement of the economic situation in the EU and Latvia has effect on labour market: employment growth has contributed to reduced unemployment. At the same time, there is a risk of youth and long - term unemployment. Increasing duration of unemployment leads to depreciation of skills and higher risk of social exclusion. Long - term unemployment may lead to an increase in structural unemployment.

Key words: *employment, labour market, unemployment, "Europe 2020" strategy*

JEL code: E2, E6, E24, J2, J4, J21

Introduction

During the recent years, most labour market indicators in the EU have improved. Nevertheless, the response of employment to growth has been quite uneven across the EU countries. Youth unemployment and long-term unemployment continued to decline, but remain high in several EU countries. The employment rate of women in the EU is still significantly below that of men.

The research questions are: Who are the unemployed? Why there are different employment targets in the EU?

Resarch methods applied in the paper are based on Eurostat methodology and Internationl Labour Orgaization, analysis of the literature and advanced papers in the field of labour market, the scoreboard of key employment indicators developed by the European Commission. Scorborde supports the identification of areas where policy response is most needed.

This discussion in the paper consists of three parts:

1. Employment and unemployment trends.

2. Employment rate targets and results.

3. Labour market policy.

Conclusions are proposed at the end of the paper.

1. Employment and Unemployment Trends

Fluctuations in employment follow closely the fluctuations in real GDP.

During the recent years, most labour market indicators in the EU have improved. The unemployment rate kept falling, youth unemployment and long-term unemployment also continued to decline. Activity rates are increasing. However, the response of employment to growth has been quite uneven across the EU countries in correspondence to different economic structures and policy settings.

The situation in the labour market in Latvia has been improved also within past years along with the increasing economic activities. High unemployment rate caused by the crisis is falling and the employment rate is rising. In 2016, the unemployment rate decreased down to 9,6% - 0.3 percentage points less than in 2015, while the employment rate rose up to 61.6 or by 0.8 percentage points. (Eurostat, 75/2017).

The scoreboard of key employment indicators developed by the European Commission, allow for early detections of key employment problems. According to this scoreboard (see Table 1) there are three employment indicators:

- Unemployment rate (15 – 74);
- Youth unemployment rate (15 – 24);
- Young people neither in employment nor in education and training (NEET) as a share of the population aged 15 – 24 .

Table 1

Summary of the scoreboard key employment indicators

	Unemployment rate	Youth unemployment rate	NEET rate
Best performers	**Czech Republic** **Germany**	**Germany**	**Germany** **Luxembourg** **Netherlands** **Sweden**
Better than average	**Denmark** **Hungary** **Luxembourg** **Malta** **Netherlands** **Poland** **Romania** **United Kingdom**	**Bulgaria** **Czech Republic** **Hungary** **Lithuania** **Malta** **Netherlands** **United Kingdom**	**Austria** **Czech Republic** **Hungary** **Lithuania** **Latvia** **Slovenia**

Source: European Commission, 2017

According to the Table 1 indicators for Latvia: NEET rate is better than average, but unemployment rate and youth unemployment rate are in the group "to watch". Critical situations have Greece (unemployment rate), Greece, Italy and Spain (youth unemployment rate) and Bulgaria, Croatia, Italy and Romania (NEET). January 2017 data are used in the table. In Austria and Estonia the unemployment rate (overall and youth) has increased faster than the EU average, but the level remains very low.

The analysis of the net changes shows the degree of flexibility or rigidity of labour market.

Labour market flows show movements of individuals between (see Figure 1):

- Employment;
- Unemployment;
- Economic inactivity.

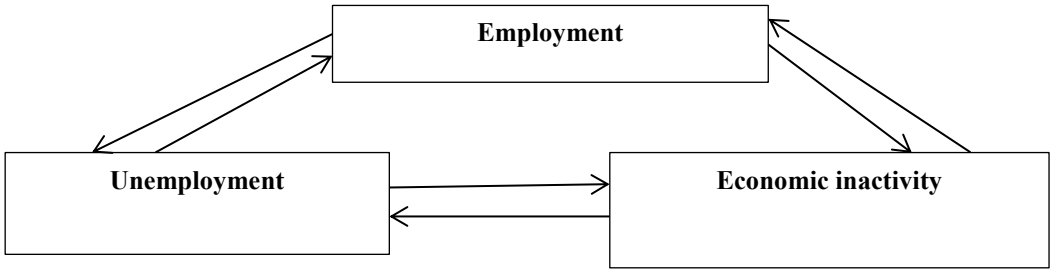

Fig. 1. **Transition in labour market status**

Figure 1 gives an overview of all possible transitions in labour market status. According to the labour market flows, there are four groups of net flows:

1. Countries with low unemployment and high transition into employment.
2. Countries with high unemployment and high transition into employment.
3. Countries with high unemployment and low transition into employment.
4. Countries with low unemployment and low transition into employment.

According to Eurostat quarterly labour market data from the European Union Labour Force Survey (population aged 15 – 74 and the first and second quarter in 2016) the distribution of the EU countries are following (Eurostat, 233/2016): 1. First group represents are: Denmark, Estonia, Sweden, Netherlands, Austria, Slovenia, Malta, Hungary, the Czech Republic and Poland; 2. Second group represents are: Cyprus, Croatia, Portugal, Finland, France and Latvia ; 3. Third group represents are: Greece, Spain, Italy and Slovakia; 4. Fourth group represents are: Bulgaria, Romania, Ireland, Lithuania and Luxembourg (examples of the first three countries of each group are the most characteristic examples). 1 in 5 unemployed persons in the EU found a job, second quarter 2016 compared with first quarter 2016.

Situation of Latvia in the labour market has disproportions. Main disproportions are:

- High surplus in professionals in humanities and social sciences;
- High share of low-skilled;
- Young people enter labour market without any specialization and skills;
- Discrepancies among formal education supply and labour market demand.

Some causes of problems in the labour market of Latvia are also due to education:

- Poor insight of career possibilities on secondary education level;
- Many young people prefer general secondary education;
- Low prestige and capacity of secondary vocational education;
- Low popularity interdisciplinary education programmes.

2. Employment Rate Targets and Results

Europe 2020 Strategy : *Strategy for smart, sustainable and inclusive growth* set EU targets for 2020. There are five quantitative targets. This analysis focuses on employment rate target population aged 20 – 64. The Europe 2020 Strategy target is to reach a total employment rate for people aged 20 – 64 75% in the EU by 2020. This analysis focuses on national targets in order to reflect situation of each European Union Member State.

According to Eurostat data employment rate of population aged 20 to 64 in the European Union was 71.1% in 2016 and previous peak recorded in 2008 was 70.3%. There is difference in employment rates of women and men. The largest difference between the employment rate of women and that of men was in Malta, Greece, Romania and the Czech Republic in 2016, but the lowest difference was in Latvia, Lithuania, Finland and Sweden. The upward trend in employment rate is for women and men.(Eurostat, 69/2016).

There are three groups of countries according to national target and current situation.

Table 2

Employment rate in the EU countries achieved national targets, % aged 20 – 64

Country	Target	2008	2013	2014	2015	2016
Sweden	➢ **80**	**80.4**	**79.8**	**80.0**	**80.5**	**81.2**
Germany	**77**	**74.0**	**77.3**	**77.7**	**78.0**	**78.7**
Estonia	**76**	**77.1**	**73.3**	**74.3**	**76.5**	**76.6**
Czech Republic	**75**	**72.4**	**72.5**	**73.5**	**74.8**	**76.7**
Latvia	**73**	**75.4**	**69.7**	**70.7**	**72.5**	**73.2**
Lithuania	**72.8**	**72**	**69.9**	**71.8**	**73.3**	**75.2**
Ireland	**69 - 71**	**72.2**	**65.3**	**67.0**	**68.7**	**70.3**

Source: author's construction based on Eurostat, 69/2017

Table 2 presents countries which already achieved or exceeded their 2020 national targets. Compared with 2015, all countries in the group increased employment rate for aged 20 – 64 in 2016. It grew the most strongly in the Czech Republic. Sweden, Germany and Estonia exceeded nation targets that are higher than EU average. Sweden, Estonia, Latvia and Ireland exceeded employment target before economic crisis. Employment growth is based on economic recovery. Estonia and Latvia did not reach pre-crisis level.

The third group of countries, that are close to the national target (see Table 3).

Table 3

Employment rate in the EU close to the national targets, % aged 20 – 64

Country	Target	2008	2013	2014	2015	2016
Croatia	**62.9**	**64.9**	**57.2**	**59.2**	**60.5**	**61.4**
Luxembourg	**73**	**68.8**	**71.1**	**72.1**	**70.9**	**70.7**
Malta	**70**	**59.2**	**64.8**	**66.4**	**67.8**	**69.6**
Poland	**71**	**65.0**	**64.9**	**66.5**	**67.8**	**69.3**
Slovakia	**72**	**68.8**	**65.0**	**65.9**	**67.7**	**69.8**

Source: author's construction based on Eurostat, 69/2017

The next group of the EU countries are with the lowest employment rate in 2016 (see Table 4).

Table 4

Employment rate in the EU below national targets, % aged 20 – 64

Country	Target	2008	2013	2014	2015	2016
Greece	**70**	**66.3**	**52.9**	**53.3**	**54.9**	**56.2**
Spain	**74**	**68.5**	**58.6**	**59.9**	**62.0**	**63.9**
Cyprus	**75 - 77**	**76.5**	**67.2**	**67.6**	**67.9**	**68.8**
Italy	**67 - 69**	**62.9**	**59.7**	**59.9**	**60.5**	**61.6**

Source: author's construction based on Eurostat, 69/2017

Lowest employment rates were in Greece, Italy and Spain in the group in 2016. These countries have the employment gap between the target and current employment rate. In order to make real progress towards the overall national targets, it is necessary to focus on the most vulnerable labour maket groups.

On the whole, the employment rate is increasing in a context of moderate economic recovery. As a result the 75% employment rate target of the Europe 2020 strategy may be reached by 2020 provided the current trend continues.

3. Labour Market Policy

Taking into account the above said to reach the goals of the "Europe 2020" strategy policy directions should be implemented in relations to both labour supply and labour demand (see, 2013). More action is needed to address youth and long-term unemployment, and support job creation, labour market participation (in particular for women), appropriate skills development.

Labour market policies include: labour market participation, job creation, active labour market policies, employment oriented social security system.

Young people are also at a disadvantage in the labour market, with an unemployment rate above the overall unemployment rate. Young people are a priority of the EU social policy to sustain the young human capital. The EU adopted the Youth Strategy for 2010 – 2018. There are two overall objectives:

- To provide more and equal opportunities for young people in education and in the labour market;
- To promote the active citizenship, social inclusion for all young people.

The "Europe 2020" strategy puts initiatives "An agenda for new skills and jobs" and "Youth on the move", youth unemployment rates will be targeted via by a range of policies, including proposals aimed at education and training institutions, or measures for the creation of a work environment conducive to higher activity rates and higher labour productivity. There are also initiatives' aimed at improving the entry rates of young people into the labour market (see, Barānova D., 2014). The European Commission considers that setting up the Youth Guarantee schemes is a forward looking and fundamental structural reform in the mid - term and long term. The Youth Guarantee aims to ensure that all young people aged 15-24 not in employment, education or training (so-called NEETs) receive a good-quality offer of employment, continued education, an apprenticeship or traineeship within a period of four months of becoming unemployed or leaving formal education (European Commission, 2013).

Analyzing youth unemployment rates and causes of unemployment, draw a conclusion that especially low-skilled youth should benefit from the Youth Guarantee.

Latvia is implementing support measures to reduce youth unemployment. The aim is to develop practical skills of the youth aged 15-29 (including) and to foster the possibility for them to find a job successfully by developing and implementing new measures aimed at youth who are neither in education, employment nor training (i.e., the youth belonging to the NEET group).

From 2014 to 2016, in total 111 000 youths aged 15 – 29 obtained the registered unemployed status with the State Employment Agency of Latvia and all of them received support as a part of the Youth Guarantee programme. During the same period, 58% of all the unemployed youth found employment. 66% of all the youth receiving support were unemployed, including 15% long-term unemployed, while 34% of participants were NEET youth. (Progress Report on …, 2017).

Within the Youth Guarantee programme, the following measures are being implemented in Latvia (Progress Report on …, 2017):

- There are 10 measures available to youth (receive information on available vacancies, obtain new skills and their first work experience).
- In cooperation with 34 vocational education institutions and colleges implementation of vocational education programmes took place, allowing youth aged 17 to 29 years obtain a professional qualification within a year or, year and a half.
- Develop skills of youth at a risk of social exclusion and facilitate engagement in education with events of Youth Guaranty, as well as activities of non-governmental organizations and youth centres.
- The imprisoned youth received individual diagnostic and career consultations and the most suitable professions were determined.A

Acivation programme for the long-term unemployed will have additional the new activity of difficulties to enter the labour market will include psychological support and the new programme will be linked to the support of public work programme.

The emphasis of labour market policy is more on structural measures supporting labour market adjustment and enchasing growth and competitiveness to achieve target set in "Europe 2020" strategy.

Conclusions

1. During the recent years, most labour market indicators in the EU have improved. But the response of employment to growth has been quite uneven across the EU countries in correspondence to different economic structures and policy settings.

2. The employment rate is increasing in a context of moderate economic recovery. As a result the 75% employment rate target of the "Europe 2020" strategy may be reached by 2020 provided the current trend continues.

3. More action is needed to address youth and long-term unemployment, and support job creation, labour market participation (in particular for women), appropriate skills development.

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CONTENT MARKETING DEVELOPMENT IN LATVIAN MARKET

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Abstract. This study shows that rapid developments in technology, the constantly growing amount of information and people's growing immunity to traditional marketing tools are just few reasons that are challenging companies to think about new and more effective forms of how to reach the target audience. One of the most recent trends is based on consumer education through high quality Content marketing. Many companies and organizations in the world have already implemented Content marketing in their marketing routines, and it has proven it's success, but in Latvia this topic is still something new and not discussed much. The aim of the study is to determine and evaluate the most significant opportunities that digital content marketing provides to companies. The main goal is to evaluate what affects usage of Content marketing in the market of Latvia based on different authors' insights on Content marketing topic in the professional, scientific literature, as well as expert interviews and Internet user survey. The findings of this research have shown that Content marketing has the potential to develop in Latvia, because not all companies deliberately use it. Content marketing provides businesses several advantages. For example, it helps to improve search results and SEO, as well as builds brand image and value, creates followers, etc. Research methods used for this study: scientific literature analysis, statistical analysis to learn about Content marketing trends, qualitative expert survey, and quantitative Internet users online survey.

Key words: *Content marketing, Social Media marketing, Internet marketing, Comment marketing*
JEL code: M31

Introduction

Rapid development of technologies, continuous growth of information flows and increasing human immunity to traditional marketing tools makes to think about the use of new, more effective ways to reach the target audience. Advertisement banners have become inefficient due to smarter use of new technologies by people. The growing popularity of social media should also be taken into account. One of the latest time trends is based on consumer education by using qualitative Content marketing. It is a discreet way to get consumer's confidence without imposing advertisement and banners everyone is annoyed from. Globally, numerous companies and organizations successfully use Content marketing, calling it the key to success, which has potential for the future.

In Latvia, Content marketing is talked about very little. There are companies using Content marketing approach in their activities, recognizing the benefits it provides; however, most of companies use Content marketing in their activities unconsciously. It means that not all of benefits, provided by Content marketing, are used, as it would be in case of conscious use of Content marketing. The authors believe that, regardless of size of a company, it is worthwhile to apply Content marketing so that the companies could reach their existing and potential clients in an appealing manner, avoiding annoying advertisements and creating a favourable public image of the company. Therefore, the study is intended to find out what Content marketing is, how many companies use Content marketing in its activities, as well as to reveal the benefits of Content marketing and the way it could be developed in Latvian companies.

In the paper Content marketing development problem in Latvia as well as its hindering and facilitating factors are studied. To conduct the study successfully, a specifically defined objective has been set up.

The objective of the study is, based on the opinions on Content marketing expressed in theory, as well as on the results of Internet users' surveys and expert interviews, to assess the use of Content marketing in Latvian companies and to develop proposals for its improvement.

To achieve the stipulated objectives, the following **tasks of the study** have been determined:

- To find and analyse theoretical literature on Content marketing topic and ways of it's implementation
- To explore Content marketing trends and factors that influence it's development;
- To find out expert views on the Content marketing topic and Content marketing effectiveness in the Latvian market;
- To get to know Latvian habits of Internet usage in the Content marketing context;
- To make conclusions and recommendations about Content marketing Development in Latvia

The object of the study is Content marketing.

The subject of the study is Content marketing application and opportunities in Latvia.

The following research methods have been used in the paper: bibliographic review; statistical analysis to find out dominating Content marketing trends in Latvia and in the world; survey and the analysis of its results, as well as expert interviews.

Limitations of the research: young people under the age of 18 years have not been interviewed in the study.

The study is based on the provisions of legal acts of the Republic of Latvia, statistical data, studies of Latvian and foreign scientists, publications in collected research articles and periodicals, Internet publications, as well as the company's unpublished data.

In the study Content marketing theory, based on theoretical opinions of J. Pulizzi, N. Barrett, T. Tucker, J. Baer, H. Cohen, L. Odden and other authors is reviewed. The study includes analysis of secondary data, interviews with Content marketing experts and Internet users' survey. As the topic of the study, Content marketing, is relatively new, by today domestic authors of marketing books have written little on it.

Study results and discussion

Summarizing the results obtained in the study, it can be concluded that in the world the importance of Content marketing is growing, and growth opportunities are visible. Content marketing is a strategic marketing approach that focuses on creation and distribution of useful, important, consistent and free content, in order to attract, retain and educate the clearly known audience, so that it would result in customers' action, favourable for the company. The objective of Content marketing is to educate the audience, so that it acknowledges the need of the product and has a desire to purchase it. Content marketing has a number of significant advantages, for example, it helps in search and SEO, forms brand image, credibility and value, stimulates the appearance of followers of the company, creates links, relationships as well as data flows. Content marketing reduces dependence on external sources, providing greater control over the company's reports, differentiates the company as an expert in certain fields, and, finally - grants versatility to company's marketing strategy, including planning, content creation, distribution and measurement. With the help of Content marketing, companies can provide their brand awareness and build a successful image. One of the most popular ways to distribute the content is via social media. It is also currently one of the main tactics used in Content marketing. In the study it has been revealed that visual content (video, infographics, images, games, applications, etc.) is becoming increasingly popular. It should also be taken into account when creating content.

The following 3 theses have been raised for discussion:

Thesis 1: The authors believe that the development of Content marketing for mobile devices could be one of the opportunities that are currently being developed, but there are still potential development opportunities in this field. In the context of this topic it would be worthwhile to conduct research on the use of Content marketing and its development for mobile devices.

Thesis 2: Each Company should assess its operational environment in order to create the most relevant and appropriate Content marketing. In the point of view of the authors, all forms of tactic are useful for all companies, so it would be worth exploring which ones are the most efficient in Latvian environment.

Thesis 3: The concepts of Content marketing are quite numerous, but it is interesting to reveal which of them are the most often applied in practice and whether Latvian companies use them in their Content marketing activities.

1. Theoretic Aspects of Content Marketing

Nowadays, there are enormous information flows, which make to think about the correct structuring text and the ideas. Consequently, an increasing attention is paid to what to say, how to say and where to say. It does not make sense to fill in blank fields with phrases in hope that someone will understand it and perceive it the way the author had intended. Content marketing has been dominating in many marketing professionals' language for several years now. However, it cannot be deemed as something completely new and innovative as companies used content as early as in the 19th century. However, at that time content was designed for printed materials, but now it is related to digital marketing, to be more specific – to Internet marketing.

The term "Content marketing" is considered to be relatively new, therefore there are many similar definitions. Heidi Cohen (2016), a marketing professional from New York, has compiled 50 Content marketing definitions on her website; some of them the authors suggest to look a tin the following table (Table 1). The overall conclusion is that most of them are long, focused on information presentation and inspiration and formulated in a descriptive way.

Table 1

Definitions of Content Marketing

No.	Authors	Definition
1.	J. Pulizzi (aka The Godfather of Content Marketing), (2017)	Content marketing is a strategic marketing approach focused on creating and distributing valuable, relevant, and consistent content to attract and retain a clearly-defined audience — and, ultimately, to drive profitable customer action.
2.	J. Baer (2015)	Content marketing is a device used by companies to educate, inform or entertain customers or prospects by creating attention or causing behaviour that results in leads, sales or advocacy.
3.	H. Cohen (2016)	Content marketing provides consumers with useful information to aid purchase decisions, improve product usage and entertain them while achieving organizational goals without being overtly promotional.
4.	L. Odden (2012)	Simple definition: Content marketing is the alignment of customer needs with business goals through purposeful content. Elaboration: Content marketing is an intentional approach to attracting, engaging and inspiring customers to a logical conclusion to buy and share through content that empathizes with the varied interests and behaviours during the buying cycle.
5.	R.C. Parker (2014)	Content marketing is the art and science of consistently creating, sharing, and promoting thoughtful, relevant, and helpful information to help to help clients, donors, or supporters make informed buying decisions while supporting your firm or organization's objectives.
6.	K. Blanchard (2014)	Content marketing is the opposite of advertising. It's about engaging consumers with the stuff they really want, in a way that serves your brand's purposes and ideals, rather than just trying to jam your logo into their periphery. It's reaching the exact

		consumers you want, instead of a vaguely defined demo. It's helpfully providing an experience they want, instead of trying to distract them from the one they came for. In short, it is the very evolution of advertising itself into something more effective, more efficient, and much less odious.
7.	B. Clark (2014)	Content marketing means creating and sharing valuable free content to attract and convert prospects into customers, and customers into repeat buyers. The type of content you share is closely related to what you sell; in other words, you're educating people so that they know, like, and trust you enough to do business with you.

Source: authors' summary based on Heidi Cohen (2016) research on Content marketing definitions.

According to Pulizzi (2013) the forms of presentation of content can be different, including video, audio, manuals, seminars, applications, webinars, stories, presentations, recipes, bloggers' posts, press releases, website texts, customers' letters, games, etc. However there are just four basic forms of content – text, images, video and audio.

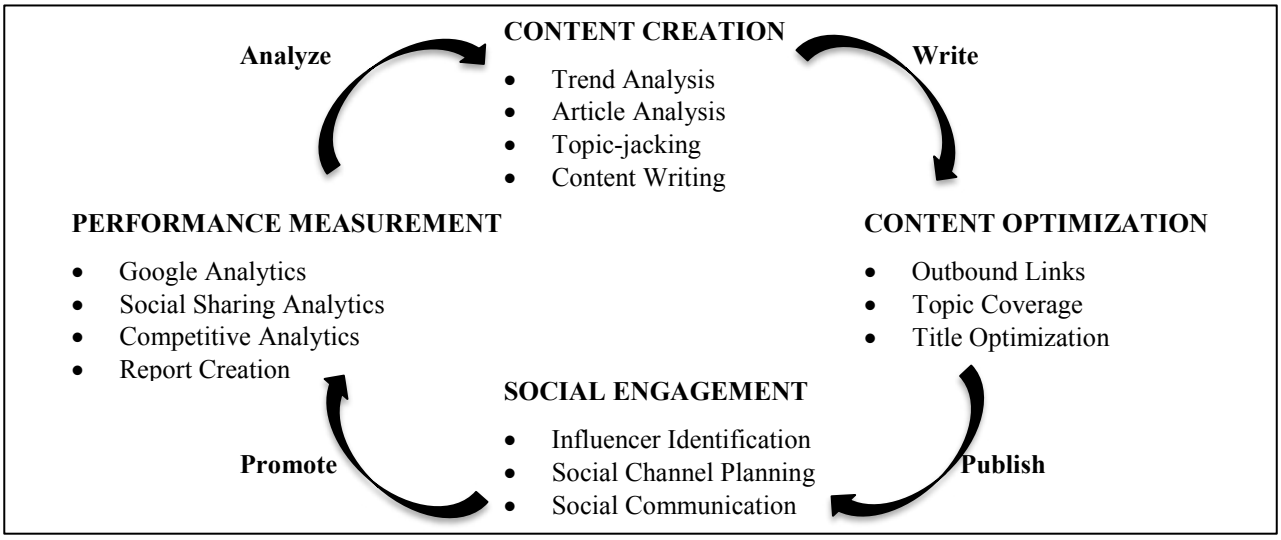
Anne Murphy (2014) and Zach Bulygo (2014) believe that Content marketing can be described as the art of communicating with consumers without direct and obvious sales. It is continuous marketing. Instead of selling a product or service, Content marketing offers information or content that makes the customer smarter, better, more beautiful, etc. The essence of content strategy is the belief that in case the brand holders deliver valuable, honest and continuous information to the customers, it should result in purchases and loyalty.

Content marketing can be based on one of the four marketing concepts – B.E.S.T. formula (Pulizzi and Barrett, 2009, 27-29), S.A.V.E. framework (Ettenson et al. 2013), The Four-Pillar theory (Tucker, 2013) or Viral content (Berger and Milkman, 2012). They are developed in order to assist companies in the development of content, pointing to what they should focus on to make the message appealing. For example, Viral content suggests that viral content is: Surprising, Interesting, Intense (ideally awe-inspiring), Positive; it can be presented as a story, with humour or fear provoking, anger proposing, breath-taking; presented with a nicety, provoking ignorance or Actionable (practically useful). On the contrary, S.A.V.E. framework suggests that marketing specialists should concentrate not on 4P, but rather on S.A.V.E., that stand for Solution, Access, Value un Education.

The authors suggest looking into the list of related terms with whom the expression "Content marketing" is often replaced with. The list has been composed by marketing researchers Pulizzi and Barrett (2009) in the book *Get Content.Get Customers*: *Custom publishing*, *Custom media*, *Corporate content*, *Corporate media*, *Custom content*, *Branded content*, *Branded editorial*, *Branded editorial content*, *Branded story telling*, *Information Marketing*, *Advertorial*, *Private media*, *Customer publishing*, *Customer media*.

To be able to make qualitative measurements of the efficiency of Content marketing achievements, it is necessary to understand the Content marketing process. In the opinion of the authors, Angela Hausman (2015) and SocialEars have reflected marketing process maximally clearly in four continuously interrelated stages (see Figure 1).

First of all, content is generated based on the analysis of trends, messages and search of likewise messages. Then writing of content in corresponding format follows. Once this is done, content optimization should be made, so that it would be possible to find Internet users based on the chosen keywords. Content publishing should follow thereafter, and one should think about how to achieve the greatest possible social involvement in the planning of marketing communication channels, social communication and identification of public opinion leaders. Only when it is done the publications can be passed to consumers. However, it is necessary to measure the activities using Google Analytics, Social sharing analysis and, of course, competitive analysis. Next, it is necessary to draw conclusions, to be able to plan improvements of the message or the creation of a new message (so the process starts again from the beginning).



Source: authors' construction based on Angela Hausman's SocialEars Content Flow.

Fig. 1. **Content Marketing Process**

In case Content marketing is done correctly, it has its own ROI as a channel, and it can be measured by the set of KPI elements. According to Neil Bhapkar (2013) there are eight indicators, classified into three groups that are worth to mention: Reach (Unique visits, Geography, Mobile readership), Engagement (Bounce rates/Time spent, Heat maps and Click patterns, Page views), Sentiment (Comments, Social sharing). Depending on the company's activities, there are also more detailed key performance indicators available, a detailed examination of which is useful when it is necessary to get more in-depth results. The assessment of Content marketing efficiency is very important for companies as it helps to identify shortcomings and weaknesses in the marketing activities as well as to evaluate company's achievements and failures.

Finally, the necessity of *Demand Metric* Content marketing is based on the fact that Content marketing is necessary to retain the reader's attention. Secondly, it is necessary to enhance buyers' loyalty to the brand. Thirdly, it is necessary to generate interest in the buyers so that they would like to follow the brand's news and to buy goods on a regular basis. And, finally, Content marketing is essential to increase direct sales in natural way, without the advertisements that the consumer is aware of and wants to reject.

2. Experts' Interviews and the Analysis of their Results

In Latvia, there is little spoken about Content marketing, therefore the related information is limited, so the authors believe that it is worth finding out experts' opinion on the subject. Questions have been prepared for experts' interviews, but the interviews were semi-structured in order to obtain as complete and viable information as possible. In order to collect data for this research and get an image of current state of Content marketing usage, there were organized 4 expert interviews with Content marketing specialists from Latvia, each of them has specialized in different Content marketing segments – content planning for businesses, web content, content related SEO, content creation and writing – to gain a better insight.

During the interviews it has been found out that to a greater or lesser extent all companies that communicate somehow (via Internet or any other media) use Content marketing, but many of them are not aware of this fact. After the interviews the authors have concluded that the companies in our latitudes still underestimate the importance of qualitative content in their marketing activities, leaving Content marketing somewhere in the background or even forgetting about it at all. One of the experts mentioned that in his internet marketing company only about 25% of their companies-customers were turning to them with a desire to improve web page content with the help of SEO and about 10% of the companies

were trying to deal with web page SEO and content creation on their own, before they were asking internet marketing company's specialists for help. One should be aware that Content marketing is not just a simple filling the website or mandatory email sending. In Latvia all classic Content marketing tactics – social networks, blogs, emails, etc. – are used. The use of social networks is the most popular. Almost every company could be found on social media (such as *Facebook.com*, *draugiem.lv*, etc.) because of the large number of consumers there. Experts pointed out that it's really common for enterprises in Latvia to use social networks and e-newsletters. Blogging is also quite popular in Latvia, but unfortunately the enthusiasm of businessmen ends up with time and started blogs are left incomplete. It should be remembered that all people are looking for benefit, information and entertainment. Therefore, the content in which these key features are incorporated will have certain advantages. Content marketing is suitable for everyone, because Content marketing is the type of marketing that suits perfectly for companies in any sector, if used properly. Each Latvian company should focus on Content marketing, however one should thoroughly think of what kinds of tactics to use. The disadvantages of Content marketing are mainly challenges - time resource consumption, costs, and negative attitudes of those who think that Content marketing is just a waste of time and resources, as well as the fact that the creation of qualitative, grammatically correct content can cause a lot of concerns. Mainly the companies that have the highest positions in the Top Latvian brands successfully apply Content marketing. The experts who participated in the interviews also recognize it.

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3. Survey of Latvian Internet Users

The authors carried out a pilot study in the May 2016 to observe possible Content marketing trends in Latvia by interviewing 100 respondents and it was decided to re-conduct the study later. In scope of the latest research, in May-June 2017 a survey of Latvian Internet users was organized with a purpose to assess Internet usage habits of the population of Latvia in the Content marketing context and to assess what content the greatest attention is paid to. The research results will provide an opportunity to assess the existing trends of content usage and to put forward proposals that should be taken into account when creating content. The study was conducted using specially developed questionnaires with the help of which Latvian Internet users have been surveyed. Latvia's population size is 1.96 million from which 1.46 million people are active Internet users, based on these data authors selected the sample size. Overall 1026 people (confidence level: 95%; margin of error: 3%), aged 18 to 64 years, have been surveyed to get a fairly accurate result about their Internet usage habits in the Content marketing context. Invitation to participate in the survey was distributed in Internet environment through via social network *Facebook.lv* and by sending e-mails and responses were collected using Google Docs. The questionnaire data were encoded and processed using SPSS Statistics V.22 and MS Excel for Mac 2011 data processing software. Respondents were divided into three age groups: school-age young people (18-19 years), study-aged young people (20-25 years) and adults (26 or older), because age affects the level of knowledge, education levels differ and that means their skills to work with content vary too. It might seem that the third group (26 or older) has quite wide range of age, but there is no need to subdivide this group further in the Content marketing context. Such an apportionment is very suitable for determining the main trends in Content marketing, and this is also due to the development of the Internet. Young adults are born in the age of the Internet, so it's more likely that they can handle content more professionally than older people. First of all, it has been found out in the study how much time the residents of Latvia spend on Internet (see Figure 2).

Source: authors' construction based on the quantitative research results.

Fig. 2. **Average time a user spends on the Internet in Latvia**

Largest part - 43% of respondents – spends on Internet 2 to 5 hours a day in average. One-fourth of respondents spend on Internet an average of 1 to 2 hours a day. In turn, third most popular answer, chosen by 13% of respondents, is 5 to 10 hours a day. As the survey results show, it is difficult to cooperate with 11% of respondents from Content marketing standpoint, as they spend in Internet up to 1 hour while 8% of respondents stay on Internet for a very long time - more than 10 hours, which means that they know web content very well. The survey has also revealed that the most popular social media sites in Latvia differ from those used in the world. The most popular social media sites in Latvia are *YouTube* (used by 83% of respondents), *Facebook* (78%), *Draugiem.lv* (47%), *Instagram* (44%) and *Twitter* (35%). These respondents definitely do not want to spend their time reading boring information. The authors of the study also wanted to find out what Internet resources the respondents trust to the most (Table 2).

Table 2

Content sources that respondents trust the most

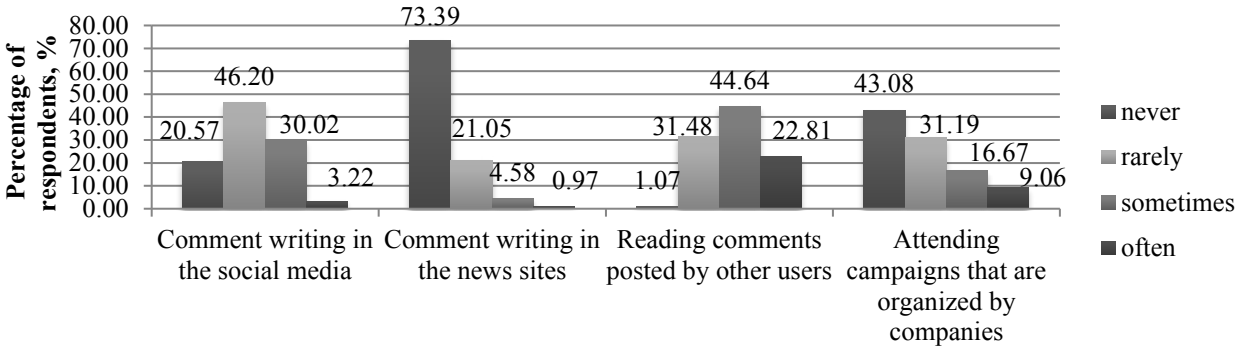
Age group	Company websites and blogs	Internet media, news	Radio, TV	Analysts sites and blogs	Blogs and websites that include independent thoughts	Printed media (newspapers, magazines, etc.)	**TOTAL**
18-19 years	79 26.78%	125 42.37%	50 16.95%	2 0.68%	19 6.44%	20 6.78%	**295** **100%**
20-25 years	108 28.05%	70 18.18%	60 15.58%	84 21.82%	51 13.25%	12 3.12%	**385** **100%**
26 or older	129 37,28%	42 12.14%	73 21.10%	60 17.34%	41 11.85%	1 0.29%	**346** **100%**
TOTAL	**316** **30.80%**	**237** **23.10%**	**183** **17.84%**	**146** **14.23%**	**111** **10.82%**	**33** **3.22%**	**1026** **100%**

Source: authors' created table based on the quantitative research results.

It can be concluded that 30.8% of respondents consider company's official homepages and blogs to be the most reliable content sources. This is an important indicator, which means that companies have to think carefully about what information to publish on their websites and make sure that it is true and up-to-date. 23.10% of respondents say they trust to the information provided by Internet news sites. This response was especially popular amongst young people of secondary school age. It should be admitted that this is the right place to learn the most recent news on the events in Latvia and in the world, however, as journalists work in the news sites, the manner of presenting information often includes various exaggerations and spectacular statements, aimed at drawing the reader's attention. An eye-catching heading provokes to read the news, but the content of the article itself sometimes does not express anything special. This has a negative impact on the reader's trust to the source of content, probably this is the reason why just 12.14% of people aged over 26 have chosen this answer. The authors have observed that the chosen answers differ slightly depending on age group; it should be taken into account when companies wish to communicate with some of the groups. The top 3 most reliable content sources for 18-19 year-old audiences are Internet media, news, Company websites and blogs, Radio, and TV. The top 3 most reliable sources for 20-25 year-old people are Company websites and blogs, Analysts sites and blogs,

Internet media and news; in turn, for the group aged 26 or older the top 3 consists of Company websites and blogs, Radio, TV and Analysts sites and blogs.

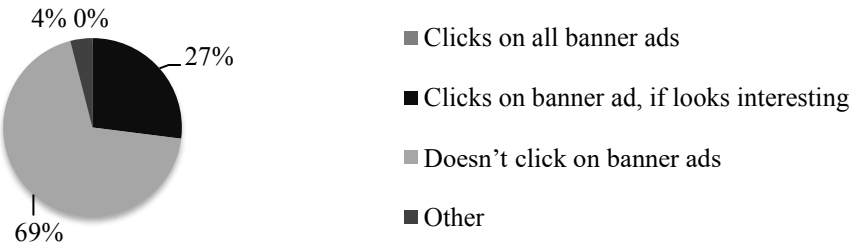
One of the ways to evaluate Content marketing effectiveness is by measuring the level of response. The more comments an article has, the greater has been the proposed effect from Content marketing campaign. Evaluating the activity of Latvian audience in comment writing, reading and corporate campaigns supporting, survey results are shown in the chart (see Figure 3).



Source: authors' construction based on the quantitative research results.

Fig. 3. **Frequency of the Internet activities**

Survey results show that Latvian audience rarely writes comments on social networks (typical for 46.20% of respondents), a quarter of respondents (20.57%) almost never write comments in news sites, 44.64% of respondents sometimes read comments that are posted by other users, one fifth (22.81%) of the respondents often read comments that are posted by other users, and 74.27% of respondents choose not to participate in campaigns organized by companies or they do it very rarely. The overall conclusion is that the Latvian audience is not keen on comment writing, but from time to time they pay attention to the things that other people write (67.45% of respondents noted that they do it sometimes or often), but 9.06% of respondents choose to participate on regular basis in the marketing campaigns that are organized by companies on the social media and 16.67% of respondents choose to participate in them sometimes. Further out, it has been revealed in the study whether banner advertisements appeal to Latvian Internet users (Figure 4).

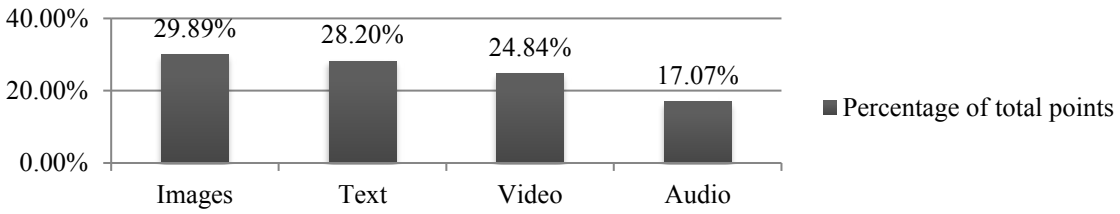


Source: authors' construction based on the quantitative research results.

Fig. 4. **Individuals who click on banner ads**

As written by David Siteman Garland in his blog *The Rise It To The Top*, everyone "share content rather than banners or useless ads". According to the studies by Siteman Garland, 98% of people say a categorical "no" to banner advertising, while the remaining 2% consider as an unfortunate coincidence if a banner has been clicked. Of course, advertisements performed great when they just appeared in Internet, because people did not know what it is. Now internet users are more educated and this "lazy" type of advertising is no longer efficient. According to the survey data, the majority of respondents - 69% - noted that they do not react to banner advertisements, however, 27% of respondents noted that they have a look ad the advertisement if it looks appealing. It should be admitted that it is not an easy task to develop an appealing advertisement, and banner advertisements are not popular among the Internet users' audience. None of the

respondents click all banners they see. Moreover, in addition to the other answers the users stressed that they "always try to close" the banner advertisements, and if ever click the advertisement, it happens only "in extremely rare cases". Next, the authors have revealed what type of content seems the most important for Latvian respondents (see Figure 5). Respondents were asked to rank four given content types (images, text, video, audio) from the most significant, assigning a maximum of 4 points, to the least significant, giving it 1 point.



Source: authors' construction based on the quantitative research results.

Fig. 5. **Content type that Latvian Internet users prefer**

The survey results show that the most important content in Internet are images that are on the top with 2093 points (29.89%), followed by text with 2187 points (28.20%); video materials with 2454 points (24.84%) are on the third place while audio materials are the least significant, left on 4th place with 3526 points (17.07%). In contrast, when assessing the parameters of websites, the Top 3 parameters, according to respondents, are information actuality, page opening speed and page design. The authors conclude that there is a tendency to support visual content.

Finally, the question "what a qualitative content exactly is" in the perception of Latvian residents has been included in the questionnaire. Answering this question was optional, but 78% of the respondents chose to express their thoughts on the issue. The most popular answers to this question were mixed, but generally it was possible to reveal certain trends. According to survey respondents, high quality content should be informative, useful, educational, topical, timely, true, understandable, without redundancy, exciting, lens, safe, interesting, properly designed, supplemented by visual material and without linguistic mistakes.

Conclusions, proposals, recommendations

Based on the conducted research, the authors make the following conclusions and recommendations:

1. Content marketing is a relatively new topic, there is no single and unique definition given to it that would provide for an accurate description, however, based on the analysis of definitions of various specialists, the authors suggest the following definition: "Content marketing is a strategic marketing approach that is aimed at the creation and distribution of useful, important, consistent and free content in order to attract, retain and educate a clearly known audience, and result to the consumers' behaviour, favourable for the company". This is a good tool to attract customers without being invasive, as provided with comprehensive information the customers wish to purchase a product on their own. And, instead of listening to a variety of subjective opinions about a product, it is better to provide interested parties with useful Content marketing campaign.
2. There are development opportunities for Content marketing in Latvia. In the world Content marketing is used quite widely, as companies are aware of the benefits it provides. In Latvia, quite a lot of companies' use Content marketing, however, as also confirmed by the experts, it is not known as Content marketing. Therefore, the authors suggest that marketing companies should promote the use of term "Content marketing" in Latvia, as it is applied in business activities, but is not known as Content marketing. The current unpopularity of this word collocation is due to the fact that Content marketing has recently appeared, and is being used in the vocabulary of marketing professionals only

since 2011. If companies were aware that Content marketing is applied, it would be possible to make better use of its benefits and measure marketing efficiency in a more appropriate way.

3. It is difficult to define disadvantages in Content marketing, as these are rather company's challenges. If the content is not created, no one will find the company. Only expert generated content is trustful, so the company must be an expert in their field. Followers and data flows are created by qualitative content, but it may take considerable time and resources to develop it that not all companies can afford.
4. In Latvia, there is a tendency to support visual content. According to the survey data, Internet users from Latvia put images on the first place as the most significant source of content, immediately followed by text. Video materials took the third place. Companies should increase the proportion of the use of visual content. In Latvia until now infographics, games and videos have been used little, however, a qualitative and creative visual content seems to be really exciting and interesting for the audience.
5. 31% of respondents indicated that they trust the most to companies' homepages and blogs. This means that companies must pay attention to the content they publish and regularly look for it to be valid and not out-dated. Companies should create blogs, because people like to read about products and/or services that company offers. Companies that write blogs appeal to the audience much more as this is the evidence that they are experts in their fields. Educational and high-quality material of blogs will be useful to anyone interested, who is looking for a specific solution for himself.
6. Only 27% of respondents replied that they click on banner advertisements if the advertisement seems interesting for them. Based on this fact, Latvian companies need to use Content marketing as much as possible, instead of deploying banner advertisement blocks everywhere. It would provide a more positive attitude towards the company without making people annoyed. A qualitative content enables to achieve much better results than annoying banner advertising. Of course, it is up to the company how to plan their marketing activities.
7. According to research findings, high quality content should be informative, useful, educational, topical, timely, true, understandable, without redundancy, exciting, lens, safe, interesting, properly designed, supplemented by visual material and without linguistic mistakes. These characteristics should be taken into account when working on content planning, creation and development.

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ERASMUS+ PROJECT EVALUATION IN FIVE EUROPEAN UNION MEMBER STATES

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Abstract. Significant amount of the European Union (EU) budget has been allocated to different student exchange programmes. In order to plan future investments, current interventions into national educational policies should be assessed. This research aims to perform a mid-term evaluation of the three-year (2015-2018) Erasmus+ project relating to high school students' Information and Communication Technology (ICT) skill development in the selected schools of Latvia, Sweden, the United Kingdom, Italy and Spain (hereinafter in text – project). The analysis included a literature review of methods applied by other researchers performing Erasmus+ programmes evaluation and the methods applied by the European Commission (EC) which lead to the development of quantitative and qualitative data collection methods for the research. Quantitative data research comprised a survey completed by the students participating in the project and collected by their teachers. The qualitative data research consisted of semi-structured interviews with the students, teachers, project managers and different project stakeholders. The research results demonstrated that the project activities had a high value for the project stakeholders and ICT skills development was relevant to all students, as they would help them in their future studies and work. The project was evaluated as very effective, as it contributed to the improvement of different skill sets of students, such as ICT skills, communication, English, teaching, presentation, cross-cultural understanding skills and others. The project is coherent with other ICT skills development activities in the project countries and, in some cases, with national initiatives to assess the inclusion of ICT skills training in school programsmes. The European added value was achieved by exchanging information about the different teaching methods used in five EU countries and contributing to cross-cultural understanding. The evaluation results could be used for planning future Erasmus+ projects, coordinating and consolidating various stakeholders' activities to promote further ICT skills training for a larger group of students and to achieve even better coherence among different ICT training activities.

Key words: *EU funds, Erasmus+, evaluation, education, ICT skills training*

JEL code: I20, I21, I28, O21, O22, O52

Introduction

Erasmus+ is the European Union's programme to support education, training, youth and sport in Europe. The programme is planned until the year 2020 with the total budget available up to € 14.7 billion, and it provides opportunities for over 4 million Europeans to study and gain experience abroad aimed at facilitating cross-border cooperation between the Member States in order to promote growth via international exchange. The programme provides young people the opportunity to obtain intercultural skills and open themselves to Europe, helps educational institutions to drive regional and sectorial innovation and stimulate economic growth and competitiveness.

Make: Learn: Share: Europe (MLSE) is an EU financed Erasmus+ programme project designed to develop digital skills amongst young people across Europe in order to assist them with learning and working with digital technologies. The project under MLSE initiative includes students (age 14 – 16) from the project partner-cities - Gijón (Spain), Riga (Latvia),

Rome (Italy), Ronneby (Sweden), Sheffield (United Kingdom) who received training on an aspect of digital making and run learning sessions for others in schools or local settings.

The research aimed at the project mid-term review by assessing the effectiveness and efficiency of the MLSE project actions to achieve the programme's objectives, evaluate the efficiency of the programme and its European added value. The evaluation covered the project activities since the start of the project in autumn 2015 until May, 2017. Based on the aim, the research tasks included literature review covering the main evaluation categories: relevance, efficiency, effectiveness, coherence and EU value added (EC, 2015) and an additional dimension for education sector project impact assessment level: individual, institutional, and systemic (EC, 2016). The importance of international education projects was also highlighted by other researchers, for instance, cross-border cooperation must be developed in education because it is such a period that borders of the countries are removed by globalisation: social, economic, political and cultural life is evaluated across the world (Ekti, 2012).

Based on the literature review, evaluation methodology and a data collection approach were designed. The main data collection tool was a questionnaire completed by 45 students. It comprised quantitative and qualitative questions and was supported by conference calls and meetings with the students. Extensive interviews with more than 15 project stakeholders and participation in the project related stakeholders meetings were very important data research methods.

The main evaluation conclusions relate to better project promotion internally and externally, better information and good practice exchange between the students and the teachers. In order to achieve higher impact at institutional and systemic levels, further coherence with other national initiatives is needed. Recommendations also included suggestions going forward to leverage on success built and to identify new funding opportunity by involving international corporations.

The novelty of the research relates to the evaluation of the project for high school students, as previous researchers on Erasmus+ evaluation have focused on higher education institution students, and practical recommendations how to increase project impact at institutional and systemic levels.

1. Literature review

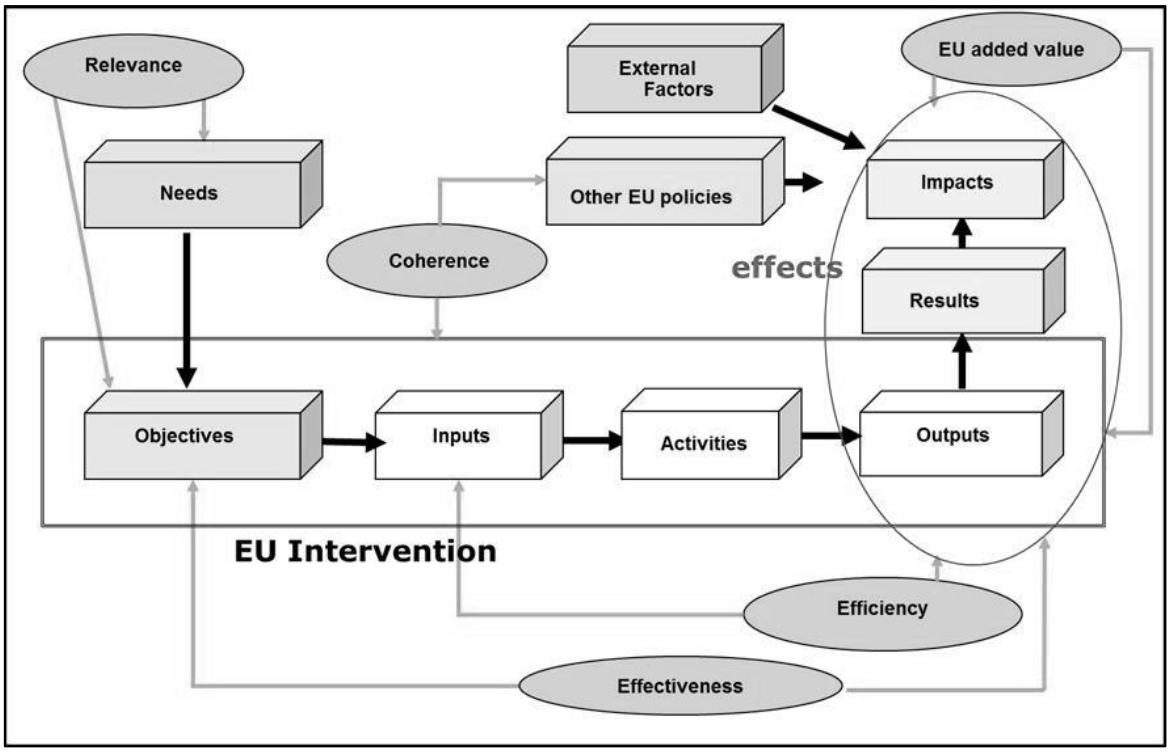
A limited number of scientific publications on Erasmus + programme project evaluation exists; moreover, the evaluations performed have taken a very practical point of view without an extensive literature review of the relevant theory. At the same time, evaluation is widely used by the European Commission to assess the effectiveness and efficiency of the planned interventions, therefore significant research has been done by EC on evaluation methodologies, and EU level evaluation methodologies have been developed based on those research results. One of the most comprehensive materials covering different evaluation methodologies is Better Regulations (EC, 2015) covering a wide scope of intervention evaluation elements ranging from policy development to policy impact evaluation. According to Better Regulations methodology, all evaluations must assess the criteria of relevance, effectiveness, efficiency, coherence and EU added value of the intervention. The European Commission has developed not only general evaluation methodologies but also a specific roadmap for Erasmus+ mid-term evaluation (EC, 2016), which takes into account not only the main evaluation questions but also three main intervention levels: individual, institutional, and systemic.

The analysis of scientific articles published by ScienceDirect in the field of Erasmus+ project evaluation and included in the bibliography section highlighted the main theoretical concepts and issues raised. The latest achievements and objectives in education is the internationalisation process (Bryla, 2012) even if there are obstacles in the mobility process (Bryla & Ciabiada, 2014). Temporarily study in another country has remained an exceptional and professionally highly rewarded experience for students from Central and Easter European countries (Teichler & Janson, 2007), however as shown by the results of this research in the following parts of this article the opportunity to interact with students from other countries is highly appreciated by students from all Member States. The Erasmus programme contributes to quality

improvement in education at three levels: individual, institutional, and systemic (EC, 2016). The long-term effects of participation in the Erasmus programme include the establishment of an international network of former Erasmus friends and usually maintained by activities in online social media, especially Facebook (Bryla, 2014).

The concept of mobile learning encompasses three dimensions: the mobility of technology, learner mobility, and mobility of the learning process and the flow of information (El-Hussein & Osman, 2010). This research will mainly focus on learning mobility involving new teaching methods and also cross-border cooperation. The importance of the learning process in the home country and learning environment is important for students' learning as well as their involvement in extra-curricular activities (Venmeulen & Schmith, 2008). Maintain and further enhance the European dimension of all actions, as this is the key added value of the programme, and better support dissemination and sharing the outcomes (European Universities Association, 2017).

Based on the literature review, the research methodology was designed including an assessment of relevance, effectiveness, efficiency, coherence and EU value added of the intervention. The proposed research methodology is presented below in a graphical form.



Source: Better Regulations, EC.

Fig. 1. **Evaluation methodology**

Evaluation methodology also included the design of specific evaluation questions and grouping them according to the main evaluation criteria as well as the intervention level – individual, institutional, and systemic. Based on the evaluation questions, the most appropriate data collection method was selected, including interviews and questionnaires.

2. Research results and discussion

Respondent groups were defined based on the programme objectives, activities, and they included: students, technicians, teachers, the project manager and project external stakeholders. During the evaluation, different qualitative data collection activities took place, including SKYPE calls with different stakeholders, a project stakeholders' seminar in Riga, a project management meeting in Ronneby (Sweden) and an interview with students in Ronneby. The results of the qualitative data

collection are reflected in the recommendations provided. Phone and SKYPE interviews were held with the project managers in all project countries. In addition, interviews were held with project stakeholders suggested by the project managers. Overall, more than 15 semi-structured interviews were held.

The students in different project countries were asked to complete the project questionnaire. The questionnaire included quantitative questions where a response to be provided ranged between 1 to 5 and the qualitative part where students provided responses in the form of comments. Altogether, 45 students completed the questionnaire in English in Latvia (15), Italy (5), Sweden (10) and in Spanish in Spain (15). The feedback from the students from the UK (more than 100 responses) was provided in a different format by evaluating the training events which were part of the project activities. The responses to the survey which included quantitative and qualitative questions were collected by teachers. The survey was complimented by phone and face to face interviews with the students from Italy and Sweden.

The quantitate survey results based on the evaluation scale 1 – 5 (1 – unsatisfied, 5 – highly satisfied) are reflected in the table below and as it can be seen, the overall satisfaction with the project is very high with an average score 4.2. There are certain questions which could be addressed during the second part of the project and they relate to ICT skills development and relevance to the leisure activities, as there was the lowest scoring; the same relates to the duration of project activities. Also, the differences in responses between Member States to be followed up by project managers. Another important aspect which could be taken into account for the project activities is the exchange of information and interaction with other countries, as very low marks from some countries highlight the need for more activities engaging students and verification that all countries and students are involved at the same level.

Table 1

Results of student's satisfaction survey (quantitative evaluation questions)

Evaluation question	Spain	Latvia	Italy	Sweden	Average
1. ICT skills developed are relevant to the study needs	3.9	4.6	4.0	4.1	4.1
2. Project has helped to develop communication skills	4.0	3.9	4.0	4.4	4.1
3. Project has helped to develop English language skills	3.8	4.0	3.8	4.2.	3.9
4. Project has helped to increase self-confidence	3.8	3.6	3.5	3.9	3.7
5. Project has helped to understand different cultures	3.8	2.5	3.5	4.7	3.6
6. project has a positive influence on study results	3.5	3.5	3.8	3.8	3.6
7. ICT skills developed are relevant to leisure activities	3.2	3.1	3.8	3.4	3.4
8. Duration of project activities was sufficient	3.4	3.0	3.3	3.8	3.4
9. Sufficiency of exchange of information and interaction with other countries	4.3	2.0	3.3	4.6	3.5
10. Good overall satisfaction with the project	4.6	3.6	4.0	4.7	4.2

Source: author's calculations based on survey results

The received qualitative responses provided by the students were analysed and categorised to cluster the data for better analysis. The results of qualitative assessment per Member State are presented in the table below. For all students one of the main takeaways and a lesson learned was the opportunity to speak in public and to meet new friends. Technical skills were not so highly ranked, and the responses to the questionnaires highlighted the importance of social interaction as one of the main projects benefits.

Table 2

Intervention benefits based on the feedback provided by students

Benefits category	Spain	Latvia	Italy	Sweden	Total
Technical skills					
To learn English	7	4			11
To learn how to program, ICT skills	4	1		4	9
To learn logical thinking		8			8
To learn more about videogames	8				8
To learn how to use drone		6			6
To have new knowledge and information exchange		4			4
Social skills					
To speak in public	8	6	4	7	25
To make new friends	9	4	4	8	25
To socialise	6		3	5	14
To know more about other countries	6		1	1	8
To develop social skills	4		2		6
To open mind	2				2

Source: author's analysis based on survey results

Students also provided recommendations presented in the table below, for project future activities by suggesting more time allocation to project activities and better information exchange.

Table 3

Intervention improvements needed based on the feedback provided by the students

Improvements needed	Total
More timing allocated for project activities	3
More information exchange via SKYPE	2
More practical projects to develop deeper ICT knowledge	2
To have more interaction with other countries	2
More ICT teachers involved in the project activities	1
To have more different project topics	1
Have good teams and work as a team	1

Source: author's analysis based on survey results

Based on the information obtained during the data collection activities, the evaluation results to the main evaluation criteria is provided below.

Relevance looks at the relationship between the needs and problems in society and the objectives of the intervention (EC, 2016). Erasmus+ programme is well known to students and teachers, and the program is highly appreciated. The relevance of ICT skills training was highlighted by all respondents and was considered among the top three skills needed for students. The main skills categories developed related to logical and creative thinking, technical ICT skills and ICT skills for future studies and work.

Efficiency considers the relationship between the resources used by an intervention and the changes generated by it (EC, 2016). The Efficiency analysis included an assessment of administrative and regulatory burden and the simplification of Erasmus+ programme implementation. Some respondents highlighted the administrative burden of the project relating to different reports to be completed as part of the project activities. Financial reporting includes the requirements set by EC and also by national authorities (especially for the national co-financing part), and it is not always easy to align both requirements. During the first year of the project, a lot of time was spent on the preparation of project related materials, including writing, translating, designing, and those activities were not directly related to interaction with students.

Effectiveness analysis considers how successful Erasmus+ programme MLSE project action has been in achieving or progressing towards its objectives (EC, 2016). English language skills were further developed during the interaction between participants from different countries. In some countries, English language training was part of the project

activities. Another important group of skills mentioned in almost all interviews was ability to speak in public. The improvement of skills listed above led to the increase of confidence, self-esteem and knowledge. Many respondents highlighted that the project required to work as a team and provided a good opportunity to interact between classmates and students from different countries.

European added value can be assessed by changes which are due to Erasmus+ programme intervention, and this brings together the findings of other evaluation questions. Under the principle of subsidiarity (Article 5 Treaty on EU), the EU should only act when the objectives can be better achieved by Union action rather than by potentially varying action by Member States (EC, 2016).

All respondents during the interviews confirmed the improvement of different skills at individual level. The type of skills and the level of skills improvement was individual based on age groups and different study topics. Skills developed at an individual level have a long-lasting effect. The programme by design includes the development and application of new teaching methods, including the idea about student ambassadors teaching younger students and interaction between teachers from different countries, therefore the achieved project impact at individual level could be complimented with impact at institution level by improved teaching skills and methods which will lead to bigger impact as it will influence a larger number of students.

Very few correspondents confirmed project contribution at systemic level, as the overall financing and the number of students and schools involved in the project do not allow to achieve high scale impact. However, the project raised a positive discussion about how study programmes should be changed to include ICT skills in the school curriculum in some countries.

The evaluation of **coherence** involves assessment how well different actions work together (EC, 2016). Internal coherence means looking at how the various internal components of project operate together to achieve its objectives (EC, 2016). External coherence means looking at how various external components of the Erasmus+ programme are aligned (EC, 2016). For this project, coherence could be achieved at infrastructure and facilities level, and at teachers' level by changing teaching methods and the same teachers being involved in different projects and ICT being as part of the school programme. Some of the project partners were engaged in the project based on the good cooperation experience in the past in other Erasmus+ projects, and many partners expressed an interest to continue the existing cooperation.

Main research findings and conclusions

MLSE project results were influenced by many complex issues, for instance, by Member States economic situation, national support to the project, language barriers, teaching cultures and methods, and other factors. During the project results analysis, it was taken into account that the students and the schools participating in the program have different background and the progress made should be measured taking into account those different starting points. Below the main findings and recommendations are presented.

1. **Improve project promotion externally.** External project promotion could include additional meetings with the project stakeholders, and the same project stakeholder could be approached in all counties in order to increase synergies. Those activities may lead to the identification of additional funding possibilities and further increase of project impact at institution and systemic level. Another external project promotion activity could be a joint declaration signed by all partners expressing their interest to contribute to the local community ICT skills development and to cooperate with external partners in order to achieve a long term sustainable impact.
2. **Promote project activities internally**. This recommendation is based on the feedback received from the project stakeholders at different levels including the students. More information about the current activities would help

to promote the idea of new projects and will help to increase the sustainability of the project results. Project managers should promote the project materials by using modern information exchange platforms.

3. **Achieve better information exchange among teachers**. Better information exchange between teachers involved in the project will contribute to the project efficiency and sustainability of project results. New teaching methods will allow for students to make the learning process more effective and efficient and could be continued after the project completion and applied on different learning subjects.
4. **Introduce information exchange and joint projects among students from different countries.** Project managers should assess the opportunity to have a joint project among different countries, regular communication between students via SKYPE and information exchange about project activities between countries.
5. **Consider balanced approach between trainings of social and technical skills.** When planning the project activities, project managers should balance technical and social skills, as both skill groups are needed and those skills highly appreciated by the students.
6. **Review the study topics and timing**. Project managers should assess the possibility to have more training sessions and to revisit training subjects, for instance, to learn better information extraction possibilities by using google or more advanced facebook usage skills.
7. **Discuss how to integrate technical knowledge in the overall study process.** Project managers should allocate more time on project activities improving teaching methods applied by the students and if needed to provide specialised training.
8. **Increase impact at institution and systemic level.** At the moment, the highest project impact is at individual level but a better return could be achieved when there is a high impact at institutional and systemic levels. This could be achieved by planning and coordinating the project activities with state institutions. When planning an increase of systemic impact, project managers should take into account the level at which ICT skills development planned at municipality, region or national level. Also, they should take into account that ICT is integrated and relates to all school subjects and social aspects of digital agenda.
9. **Coordinate higher coherence and bigger impact between different schools**. Project promoters should consolidate different infrastructure between schools to achieve synergies also at the infrastructure level**.**
10. **Build on success achieved and develop new project ideas.** Project managers should ensure that project activities are aligned at the planning stage with long-term education goals in the country and coherent with other projects in the country. Future ICT skills development activities to be built on four main pillars – citizens, municipalities, universities and business.

The research was for one specific Erasmus+ project, but the recommendations suggested and conclusions drawn are relevant and could be considered for other Erasmus+ related interventions, as the information collection activities were performed in five Member States and reflected a wide territory of interventions.

In the conclusion, it could be stated that the Erasmus+ ICT training related intervention helps to **build an interest in technologies for different student groups** and contributes to equal opportunities principle implementation in practice. The developed skills sets contribute to EU general intervention principle related to creation of jobs and growth and in this specific case to develop an **effective future digital citizen** who can use digital skills in studies and at work. It also provides a very important change in the students' mindset by assuring the behavioural switch **from consumers to producers** by this in the long-term contributing to the economic development. The cooperation between students from different Member States contributes to further EU integration.

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THE CULTURE ECONOMY AS A SIGN OF RENEWAL OF RURAL TERRITORIES IN LATVIA

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Abstract. Two parallel processes have been observed in rural territories in Latvia lately – depopulation, shrinking, centralization, on the one hand, and innovative activities, rebirth of places, building of community, on the other hand. It is seen as a part of common trends in rural territories where social and economic activities are considered to be a form of endogenous development in which economic activity is re-formulated so as to be based more firmly on local resources, physical and human. Latvian researchers have highlighted the emerging of the culture economy in Latvia recently that is seen in mutual exchange of goods and services, dense use of cultural products and heritage both on individual and collective levels. However, a variety of economic relations in rural territories in Latvia is not considered as being a powerful driving force for the renewal of rural territories yet. The aim of the research is to reveal models of the culture economy in the context of renewal of the rural territory and society. Results collected using qualitative social research approach reveal different models of using tangible and intangible culture resources bringing new economic forms to rural territories of Latvia. Those economic forms are quite fragile as they are small and do not provide high profit yet, however they bring out a set of developmental functions and are seen as a sign of healthy communities and renewal processes in rural territories. Planned and supported culture economy is seen as a tool for rural policy in Latvia.

Key words: *the culture economy, reorganization of economies, rural renewal, social and economic traits*

JEL code: Z10, Z13

Introduction

During the past few decades there have been more and more researches and publications that study and analyse local culture as the development potential in rural territories. It is mentioned that appreciating the uniqueness of community and local culture helps in the interpretation of study data and clarifies development trajectories. Moreover, while it was once viewed as a constraint or limitation to modernisation and development, rural culture, under the right circumstances, is a potential strength. Appreciation of this fact can contribute to new, more effective development strategies (Brennan M.A. et al., 2008). The importance of culture is widely supported by authorities (Reshaping Cultural.., 2015) and used in strategies on different levels of policy- making.

The topicality of the research is determined by the necessity to find resources for sustainable development or renewal of rural territories and Latvian society in general. Latvian researchers have mentioned that considering the shrinking processes taking place in Latvia it is necessary to develop place-specific policies for different areas, that shrinking requires the need for a set of innovative, knowledge-, evidence- and place-based; coordinated; pro-active; multi-disciplinary; spatial; economic and socially-targeted policy measures (Puzulis A., Kule L., 2016). The documents of cultural policy accentuate the significance of culture and culture environment in the sustainable economic growth and sustainable development of Latvia (Cultural Policy…, 2014). At the same time it is stressed that there is a shortage of studies and examples of good practice in Latvia showing the role of district culture resources in the economic growth of the said territories, promotion of employment, attraction of investments, and expansion of civil participation. In some places in Latvia the development of qualitative cultural environment is being neglected which can be explained by the fact that

society lacks understanding of the cultural environment as a resource for sustainable development (Hermane A. et al., 2013). Gradually, the appreciation of the culture environment as development potential is coming into the scientific and research field of Latvia (Līviņa A. et.al., 2016, Kruzmetra Z. et al., 2016), but there is a real necessity for policy makers of all levels to recognize the value of material and non-material culture, since the lack of this recognition creates an imbalance between the actual community practices in rural territories and political agenda in Latvia.

The term "culture economy" is indicative of a particular subsection of economic activity; it is associated with cultural products and activities as opposed to, for example, transportation or mining (Pratt A.C., 2009). The concept of culture economy was born as an answer to macro-economic perspective and points out that not all the problems in economy and society can be solved by major investments, significant job growth, reduction of unemployment etc. Moreover, recent decades have seen an increased scepticism about the relevance of GDP and the search for other indicators of progress and sustainable development has intensified (Costanza R. et al., 2009).

Culture economy have been used in multiple ways; it is related to such terms as "creative economy", "cultural industries" etc. Culture economy is a part of a wider set of complex relationships which is the economy. According to the sectoral approach, it means specific types of production – goods and services that serve as instruments of entertainment, communication, self-cultivation etc. The labour market and organization of production approach sheds light on flexible specialization by "communities of workers" with "special competencies" or instinct-like capacities. Individuals engaged in the culture economy also tend to operate on an informal, part-time subcontracted basis, earning the majority of income from other sources. The "creative index" approach describes creativity as a central across all industries that raise development of "creative class". The convergence of formats means that creative products are increasingly reliant upon a common digital platform (Gibson C., Kong L., 2005).

Culture economy includes cultural entrepreneurship as well. It is claimed that cultural entrepreneurs have been largely ignored by economic development practitioners and policy leaders. However, investing in cultural entrepreneurs is the crucial next step for building a regional economy that addresses poverty, embraces cultural diversity, and creates broad–based economy. Investing in cultural entrepreneurs and building bridges into communities where cultural talent is deep and enterprise resources are scarce is the key leaving point for creating holistic community and economic development in diverse communities (Aageson T. et al., 2010).

According to this approach, the system of the culture economy consists of three core element groups: originators, production, and markets and distribution. For instance, originators are artists, authors, craftspeople, designers, hoteliers, performers, architects, musicians, farmers, interior decorators, chefs, and dancers. Production elements are printers, foundries, builders, reproducers, restaurants, and recording studios. Market and distribution elements are restaurants, festivals, publishers, agencies, internet, galleries, coops, shows, theatres, boutiques, exhibits, museums, and tour operators (Aageson T. et al., 2010). Even though these features are more often linked to urban environment, researchers extend them to rural territories as well claiming that the rural creative economy consists of a mix of craft-based and traditional local culture (both material and symbolic) and new creative industries (Roberts E., Townsend L, 2016).

Culture economy is closely linked to sustainability and renewal of society since it implies the development of individual abilities, talents and creativity, which are made topical and important by modern social development approaches. According to them, individuals are the source of development if their potential is used (education, attitude, faith, values, abilities and information) (Striano M., 2010). Creativity, collaboration and responsibility of local people in rural areas are seen as signs of neo-endogenous local and regional development and are related to the finding better solutions for existing environmental, economic and social problems (Neumeier S., 2016).

In this context, using culture as a tool in economic development offers a number of advantages:

1) Economic development based on culture provides an escape from race to the bottom. To avoid this race, a community must provide something that others cannot easily replicate, something distinctive and sustainable. Culture and other „place-specific" qualities are exactly this kind of asset. As the output of the global economy becomes more homogeneous, consumers crave unique and authentic products and experiences. Examples include the growing popularity of local foods, artisan crafts, festivals and ecotourism;
2) Cultural production – especially small scale family and community-based production – lends itself to the kind of flexibility that is required to thrive in today`s economy;
3) Cultural production utilizes diverse skills that are passed down within a community, requires little capital, and can be done in the home. This allows an individual to balance work with other family and community responsibilities. Often, women are more included in the cultural workforce and contribute to the development of both meaning and economics;
4) Cultural production renews respect and value in a community`s history and traditions, fostering a sense of pride while encouraging younger generation to maintain their ties. A community`s cultural places and products serve to cohere and give identity to a community. This sense of identity and community belonging are essential to our well-being (Aageson T. et al., 2010).

Culture is becoming a contact and integration point between an individual and community. The use of tangible and intangible cultural resources leads to economic relationships between residents and groups in the local community and also broader network. It is especially important for marginalized communities. Simultaneously, it is emphasized that two key resources needed to support rural economic development included financial resources and appropriate infrastructure (Ryser L., Halseth G., 2010).

Referring to the abovementioned thesis, the aim of the research is to reveal models of the culture economy in the context of renewal of the rural territory and society in Latvia. Authors focus on the linkage between culture and economy in rural territories in Latvia. The field work was conducted as a part of National Research program ECOSOC-LV 2014-2017. The case study approach was used as basis of research methodology focusing on the manifestation of the studied phenomenon in a particular environment where actions take place and using multiple data sources (Robson C., McCartan K., 2016). Three Latvian rural territories that for a number of years have been publicly recognized for their cultural and economic activities – Straupe, Druviena and Kaldabruna – were chosen as cases. The case study involved 9 semi-structured individual and group interviews with the organizers of implemented activities, observations and document analysis. The data analysis was descriptive in it`s design, interpretative and directed in accordance with the research questions: 1) what are the development models of culture economy of the studied rural territories?; 2) what is the relationship between culture economy and community formation and place development? The research is qualitative in its nature, so its data cannot be generalized; nevertheless, it describes and explains the manifestations and context of the phenomenon of culture economy.

Research Results and Discussion

The research results are described for each case separately; at the end the authors analyse those aspects that mainstream all three cases and interpret the results from the theoretical standpoint.

1. Description of the case studies

Straupe is a small village in northern Latvia 72 km from the capital with a population of just over 700 residents. Straupe case began with economic activities, such as the creation of rural fair organized by an active nongovernmental organization "Slow Food Straupe" (Straupes lauku.., 2017). One of its organizers Rudite Vasile says: *„When 10 years*

ago we came up with an idea about Straupe fair, first of all I had practical benefits in mind: how to provide my family with good, clean produce and give a chance for the locals farmers to get some income". At present Straupe is home to one of the most important farmer`s markets in the country; the motto of Straupe rural fair is: *"We grow. We make. We sell".*

The Straupe market is somewhat atypical. Normally rural producers travel to towns to sell their wares, but there are the inhabitants of nearby towns and villages who travel the country, go to Straupe, to reach the producers. Every market day 60-70 producers come together to sell their wares. In the beginning the organizers developed its internal rules of procedure which states that only locally-made and/or locally grown goods can be sold there and that the preference is given to manufacturers operating in the 40km radius around Straupe. Each potential participant's offer is considered in the members of the organization meeting. With the rapidly growing supply by local artisans, the selection criteria were reinforced to remain competitive among many other start-up fairs. The offered goods are assessed and selected protecting the local culinary traditions and using traditional methods. The fair offers opportunity to learn ancient skills, such as cabbage planning and making sauerkraut. Participants have a chance to participate in workshops to learn about product quality and packaging design.

Trading in Straupe country fair is done in the style of ancient traditions as a direct trade between local farmers, outworkers and buyers. In 2016 the fair found its new home in the renovated stable building of the historical Straupe horse post station (18th cent.).

Straupe country fair has become the first fair in Latvian that was awarded the culture sign "Latvian heritage" for the restoration and maintenance of Latvian market traditions. Market organizers now say: *"Well, I want to roll up my sleeves and work some more!"* At present the Straupe fair is the only farmers and small producers market in the Baltic States that having implemented all of the Slow Food International Fund for quality criteria has become a member of the international Earth Market Alliance. This means that the production that goes into the fair is produced according to the Slow Food philosophy - it is local, safe and healthy, grown in good faith, respecting the diversity of nature and thinking about environmental sustainability.

This example demonstrates that it is possible to develop a different philosophy in a rural territory and, based on its principles, build an economy that is world-renowned, thus stimulating its further growth. The organizers of the fair appreciate the uniqueness of their area and traditions and firmly defend their position. This case proves that local cultural values are not just something theoretical, but that their exploration and exploitation increasingly deepens. The existence of the fair has left a positive impact on the community and has become the cultural centre for the surrounding area. Informants admit that under its influence *"the people started reviving ancient knowledge of farm work and foresting, plants and their use in medicine, cooking according to granny's recipes, and finally we restored the old Straupe Horse Post complex".* The development of Straupe country fair has stabilized community incomes, crafts, unique and authentic products, utilized diverse skills that are passed down within a community. It is a growing market of community-based production that results in territorial development, well-being, place branding.

In the centre of **Kaldabruna case** we have the nongovernmental organization "Ūdenszīmes" (*Watersigns*) in the renovated school building (since 2007) that is located in Rubene rural territory, Jekabpils Municipality 177km from the capital (Biedrība "Ūdenszīmes"..., 2017). At present there are about 150 residents in Kaldabruna; the village does not have a functioning school, post office and other necessary infrastructure objects. The members of the organization said in one of the interviews: *"There is nothing around us – no shops, no post office, no jobs. The awareness that we are "the middle of nowhere and a backyard" is extremely degrading and awful."*

The foundation of Kaldabruna case is the activities started by Ieva Jatniece in the old school of Kaldabruna. Ieva is a newcomer from Riga; she was looking for a second home in the country. At first the local were rather distrustful towards

Ieva, since it has been typical for newcomers to hold themselves apart from the local environment and people: *"In the beginning a newcomer is not trusted; locals believe that the building will have a tape around it."* But in this case people witnessed a successful joining of a newcomer and local human resources. Namely, Ieva's artistic ideas merged with the local resident's by the name of Indra desire to help people to stay living in the countryside: *"I was unnecessary to the community; I couldn't find a job, but wanted to help people. I couldn't get away from the idea: help, help. I met with Ieva and asked if I could be here. I began collecting clothes for the little ones, talk to the mothers. Ieva didn't know the locals and what families needed. This one does not have a bath, no place to do laundry."* Other enthusiasts joined them and now Kaldabruna old school functions as both a tourist attraction in Selija district and a provider of various social services to locals: one can learn cooking, do the laundry, take a shower, fix clothes, use the Internet, print, copy etc.; respectively, the association organizes all its functions to cover the population's needs which should be provided by local government. In addition to practical things school also acts as local residents' emotional and moral support point: *"It is important for the community that we are here. Even the people that are not involved in this are proud of us"*.

Regarding the economic benefits of the society's activities, informants emphasize that initially they operated practically free of charge, gradually attracting EU funding of projects, investing in school repair and equipping. At present they have developed a cooperation network that benefits not only the society, but also the local community. For example, the society cooperates with local farmers to supply the products. The society cooperates with the State Employment Agency providing opportunities to young people for short-term employment. Thus, currently association's capacity and the effect is that it acts as a social and economic support centre: "*For a long time the village was 'in a pit'.... even by the village board it was viewed as being in a strange status, somehow on its own, as a tail that nobody needs. There are no local government infrastructures here; they have no place to invest. It is just us"*. These words vividly illuminate the problems of rural territories and the national policy towards them. Kaldabruna is an outstanding example of how resources and jobs can be created practically 'out of nothing': "*It has been 8 years of work, and now we see income and profit; outsiders are willing to pay not just some project money, but his or her own hard-earned money for what we are showing here"*. In the case of Latvia this is good practice since typically societies and/or municipalities cooperate only within different projects. If something surpasses this type of cooperation, it is considered to be a qualitatively different level.

Informants believe that currently networking of societies, municipalities and entrepreneurs in development of tourist routs is the most realistic and potential model of economic cooperation: *"We must think how to get people out of their homes, to go and see places. It can be on a smaller scale, but we must think logically and strategically"*. For example, people in Kaldabruna cooperating with other villages have developed the tourism route "The first journey of Latvian poet Rainis". The experience of Kaldabruna in restoration of the community and territory has been applied by both further and nearer counties. Even the smallest impulse can encourage people to organize their own local activities: *"Once I had two boxes of pickles, I was thinking where to take them. I took them to the church in Bebrene. And soon they opened a soup kitchen. They quickly realized they can help the poor; now they serve soup twice a week"*.

The experience of Kaldabruna village corresponds with the theoretical ideas of the renewal of society about the exploration and use of local resources, creation of material and non-material culture in order to not just survive, but also to develop. Such examples demonstrate that, in principle, any village status with any previous experience and situation could radically change, and that the decisive factor is the human activity. The active residents of Kaldabruna have seen the potential of their place, have created their own products, 'the story' about the place, which helps to free themselves of the traditional status of 'province' and gradually develop new economic forms that are based on the values, needs and resources of local people *"Working out of our free will we have reached the level when people start paying. That's the effect of the public activation. We are two newcomers here. The others have grown into tour guides, artists and absolutely multi-functional people that can get ready 'in a blink of an eye'"*.

This shows that positive growth can be observed at an individual level; people themselves can acknowledge and appreciate it. Referring to the theoretical arguments that the place (community) development is based on free space available for human activities, opportunity to realize their goals and ideas, we must say that the people we met in Kaldabruna created such environment on their own and gradually obtained various competences, which currently allow being competitive in labour market: *"Under the impact of this place I went to study eco-tourism; I will graduate next year. I will have an official tour guide position"*. The experience of the interviewed Kaldabruna residents can be formulated very similar to the theoretical arguments: *"This is a great place for self-development. I used to be like a hedgehog… The society did not care if I even existed... I was a mom for my family, but it did not involve self-expression, learning or growing... Actually, there wasn't a place where to do all those things. The closest place was somewhere in Jekabpils, Daugavpils. But here you rise for 180 degrees; your self-esteem grows and you start feeling like a real person, useful for Latvia. You get to share what you know. One needed a place where he or she is understood, not just the family, but also fellow humans"*. In this way, the needs of local people are taken into account and the place is created for fulfilment of their needs. The development scenario of Kaldabruna demonstrates that the creation and use of tangible and intangible cultural values both serve as a tool for designing new economic forms and shape the community and gradually make the people rely on place-based growth.

The case of Druviena is based on several mutually complementing factors that motivated local people to be active creators of their own environment. First of all, informants Inese Zvejniece and Velga Cernoglazova mention local patriotism: *„We were born here, our school is here, our family home is here, and that's why it is very important to us... that the name of Druviena be alive because I want to continue living here. Thus, we design this life here for ourselves, so that we would have a full and interesting life. That's the main thing. And also for our children, so that they would have a sense of belonging and understanding that this is where their home is and they always have a place to return to, and that they also have some opportunities here"*. We can add to the abovementioned some pragmatic considerations; for example, due to the administrative and territorial reform in 2009 Druviena became a part of a relatively large municipality – Gulbene, which to a small outlying rural territory 168 km from the capital (population of 528 in 2016) generally implies deterioration of the situation. Although informants note Gulbene municipality support on various issues, such as subsidies to local schools, rural people understand that their needs will not be discharged at the level of priority. Using a variety of legal forms (NGOs) and sources of funding Druviena people have attracted funds and are gradually developing into a "centre of Latvian culture" based on its history and existing cultural and human resources. This phenomenon presents a type of specialization of a settlement, which is contrary to the common practice of municipalities that tend to develop full set of services in each place rejecting mutual cooperation and complementarity. This specialization is facilitated by the Latvian Rural Forum that encourages rural people to think on the development of the place in a more sustainable way. Turning back to Druviena case, several other alternatives were considered before people chose "the centre of Latvian culture" in 2013. They were: sports and health centre, an excellent place for living, home for entrepreneurship and even "the cradle of religion," although in fact the village did not have the resources to fit such a name. It means that place and community resource identification takes place slowly. It may be that in this ways, somewhat artificially, people are forced to formulate the directions of development and specializations for a particular village or municipality.

Druviena case study confirms two fundamental ideas that relate to the culture economy. The first is related to the fact that the targeted creation and sales of cultural product brings economic benefits. In practice, this takes the form of events, activities, camps where visitors feel closeness to Latvian traditions (Druvienas cilts, 2017). Traditional activities are combined with modern activities in order to make them interesting to a wide range of people, for example, a single event includes both traditional songs and games and henna drawings of Latvian ornaments. Event organizers also admit that at the beginning it was done virtually for free, because they lacked marketing skills, but gradually they were forced to learn

those as well balancing new with established values: *"We have visitors, 100-200 people from all over Latvia. And if they come to Druviena, they obviously are able to buy our bread, cheese, garlic... thus we began organizing fairs as well. But they're not large; we can't promise: you just produce, cause there will be guaranteed [income]"*. Respondents admit that local people join these activities with their products or activities rather passively; it takes some time to make a change.

The second aspect relates to the close and dense networking and joint work of the people involved and relevant institutions: *„We are rather successful in this, because we are a small village; there is nothing to fight over, we know each other and know when and who we can call for help. We do not divide – now this is a school event and that is a culture centre event... If any of these bodies organize an event or an activity, everyone is invited and we join the forces... we assess under which cap it would be more beneficial to operate"*. Horizontal networks and the existence of successful cooperation within its framework reduce the centralization of power, its negative expressions and other aspects which usually hinder the introduction of innovative ideas.

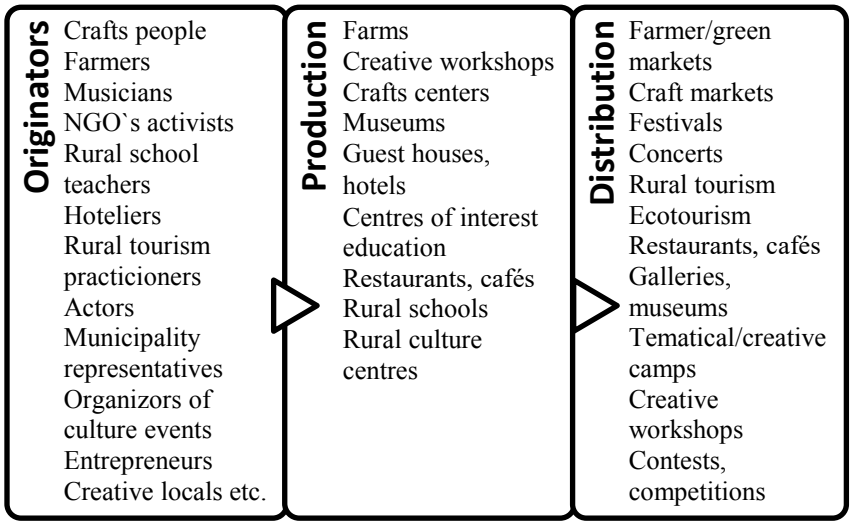
This echoes the relationship of culture economy with the community processes. Perhaps culture is so important to community building, because it affects people's emotional aspect, it is easily understood by all segments of society, it has a unifying aspect and helps to form common identity. Culture economy, thus it is an organic way of meeting basic needs (physical, emotional, social welfare) of individuals and communities: *"Despite the numbers, people should have high-quality living environment. In any case, environment must be orderly. For example, this year in Silmaci [museum] a whole area was cleaned up, so all the summer events could take place there. Craftsmen come from other regions and leave their money here. They leave the money in the shop as well. That's how it is!"* At the same time Druviena school demonstrates that not all of culture must be turned into profit, otherwise income becomes an end in itself: *"We do not raise prices unreasonably for the camps, because then the people that really want to participate won't come. Then only the paying clients will come, then it won't be open for others"*.

The stories of Druviena informants point to another theoretical aspects, namely, at the policy-making level the support for atypical (incomprehensible) cultural activities is difficult to get, even if there are proven economic benefits and sufficient existing resources. Continuing to develop their specialization, residents of Druviena have submitted various business projects to help set up service centres (different types of workshops, training, small manufacture of harps where work places could be created. Currently, they have been approved, but the projects were under evaluation for a long time. Informants explain it by the fact that ideas are unusual and original and different from "automatically eligible" (such as wine-making) project ideas. Also cultural activities are not always supported at a regional level, for example, local government has difficulty understanding why would "*small Druviena have two organizers of cultural life*". This points to the fact that Latvian institutional system often lags behind the local activities and still do not accept culture as a pillar of the economy and current tool of the renewal of society.

2. Discussion

People in rural areas are coming to a more profound understanding of the importance of cultural heritage in the development of the place, not only economic, but also social, mental, ethical and aesthetic. There have been various causes to this process – both rational and irrational. Place patriotism, "province" status after the administrative and territorial reform, lack of support from the state, inconsistency of EU funding allocation, unemployment, necessity to develop individual and collective surviving strategies – all these things in some ways forced the local people to find resources and to develop their cultural, economic, social proposal. These conditions have unleashed human creativity, opened individual and collective resources, and induced high adaptability. This is shown by the local networks that unite schools, museums, public administration, NGOs, entrepreneurs and so on.

Referring to the theory of the core elements of culture economy and examples identified in the study, it is possible to create a list of examples that are more applicable to the Latvian situation (see Figure 1).



Source: authors' construction based on Aageson T. et al. and on results of the research

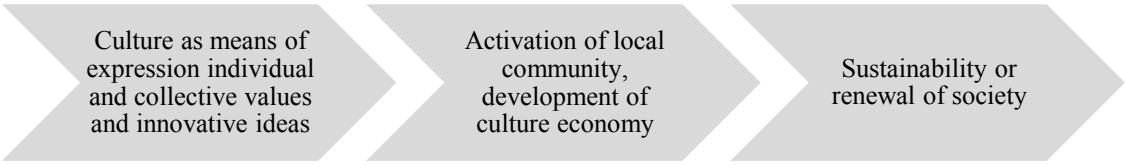
Fig. 1. **The core elements of the culture economy in rural areas in Latvia**

In any given rural community, this list would be different, but in general the following examples show the local people's creativity, activity, and formation of horizontal networks. The conducted study shows the evolution of direction of culture economy, although the state institutions do not see its value since it does not give a significant GDP contribution to macro-economy.

In terms of models, the development of cultural economy in rural areas and how it is related to social sustainability or society renewal, it can be argued that there is not one scenario used by the studied rural communities. For example, in the case of Straupe the economic aspect was the key aspect from the very beginning, while in Druviena greater emphasis was placed on the Latvian traditions and in Kaldabruna – on the sphere of art. In cases of Druviena and Straupe the activities began with local people, while the resources of Kaldabruna were noticed by a newcomer from Riga. But the mentioned differences do not alter the main features that point to the development models of culture economy: in all cases, either the existing cultural and historical values are used or new ones are created locally; out of cultural values the choice falls on those types of products that are very diverse and display local people's creativity; more and more new activities are developed that provide sales avenues for the products; existing resources are used quite rationally, and people seek opportunities to attract funding; the networks gradually extend to an increasing array of different sectors and industries and their agents; good practice is spreading in the surrounding counties. Mentioned features strengthen and institutionalize the ongoing projects and are gradually formed into a resource of economic and social development rural areas and regions.

Despite these positive aspects studied in rural areas, informants noted a number of obstacles to culture economy development, such as lack of infrastructure (cases when NGO play the role of municipal or state institutions), wariness shown by different institutions towards to cultural projects, inadequate funding, the funds do not reach those organizations that are closest to local community, etc. This shows that culture economy is not seen as a potential for neither economic development nor growth of rural territories.

In terms of the relationship between culture economy and the society renewal, it can be argued that the development of culture economy gives people more benefits than just additional or basic income. In all cases, community activation, creativity, identity formation is closely linked to the culture economy (see Figure 2).



Source: authors' construction based on results of the research

Fig. 2. **Relationships between cultural activities and the process of renewal of society**

The image formed according to the interview results reveal a clear link between the fact that individuals and communities begin to disclose their abilities, create products, and take responsibility for themselves and the community, and the reinforcing sustainability of the society. In this way, studied rural communities have confirmed the theoretical claims of other studies that the relationship between these elements exist and that perhaps it is the only viable path for survival and growth.

As the study confirms, the creation and maintenance of culture-based values and the community activation are possible anywhere, not only in traditional cultural or historical centres. However, despite the amount and importance of the effort involved, it should be noted that these active rural communities are in risk of making their tangible and intangible product as an end in itself, focusing only on profit. Such social practices, according to sociologist George Ritzer, in time become "empty" or "vain"". Although in the studied communities such signs were not observed, the risks continue to exist while economic performance is growing rapidly. Thus, the optimal way forward, as shown by the cases studied, would be a bit slower than using a classic marketing strategy and continue being grounded on local values, resources, and cooperation networks.

Conclusions, Proposals, Recommendations

1) Findings confirm different aspects of theoretical statements of culture economy, especially its creative potential and strong embeddedness into local resources and Latvian traditions. Research data reveal the importance of new economic structures and confirm their power instead of marginality;
2) The study cases demonstrate that culture is a resource for economic development of places for obtaining basic and/or additional income. The development of culture economy offers not only economic, but also social benefits – activation of local community, growth of local patriotism, strengthening of cooperation that testifies of the processes of society renewal. Latvian countryside shows the signs of the rebirth of marginal places. This is evidenced by the fact that local people are motivated to act, seek self-realization, learn new skills and use the existing community-based production;
3) Having studied three different examples of culture economy, authors conclude that the development of these models is different but they share common characteristics – awareness and use of local resources and the increase of cooperation. Existing models allow creating economic benefits and social activities that promote place-development and society renewal. The core of models is replicable and usable in any case of place-based development;
4) Currently, the most important support for culture economic activities is provided by non-governmental sector, therefore there should be greater involvement of state and municipal institutions to assess and specifically use cultural resources in rural territories. The abovementioned principles can be integrated into place-development plans and strategies. Culture economy must be viewed on both national and regional levels as a significant subsection of economic activity.

Authors express their appreciation to the National Research Programme for the period 2014–2017, project 5.2.4. "Renewal of society through reducing the risk of depopulation, through demographic development and strengthening links with the diaspora for the transformation of the Latvian economy" and project 5.2.8. "Cultural environment development, preservation of the nature diversity and urbanisation processes within the context of the balanced development of Latvia" for their support in the investigation of the topic.

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THE IMPACT OF OWNERSHIP STRUCTURE ON INTELLECTUAL CAPITAL EFFICIENCY: EVIDENCE FROM THE POLISH EMERGING MARKET

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Abstract. While previous research demonstrated the importance of intellectual capital for modern companies and their shareholders, the current understanding of its nature and role has many gaps. Our paper tries to fill some of them and contributes to the existing literature in two ways. Firstly, by showing the relationship between ownership structure and intellectual capital efficiency, we provide direct evidence for the substantive role of intellectual capital for various stakeholders. Secondly, prior studies on the relationship between ownership structure and intellectual capital efficiency were mostly conducted in Asian emerging markets. In contrast, this paper examines this relationship in a Central and Eastern European country. In view of this, the purpose of our study is to investigate the relationship between ownership structure and intellectual capital efficiency measured by the value added intellectual coefficient in the Polish listed companies. Analysing an unbalanced panel data on the sample of 354 Polish companies listed on the Warsaw Stock Exchange and 1,505 company-year observations between 2006 and 2011, we found that managerial ownership negatively affects the value added intellectual coefficient and structural capital efficiency. In addition, foreign ownership negatively impacts capital employed efficiency.

Key words: *Agency problem, company performance, intellectual capital, ownership structure, Poland.*

JEL code: G34, L25, O34

Introduction

The creation and efficiency of intellectual capital (IC) are of utmost importance for companies. Hence, some authors pointed out that IC-oriented companies will be the winners in terms of future value and shareholder wealth creation (Edvinsson L. & Malone M., 1997). In consequence, intellectual capital was the subject of many studies examining the relationship between its value or efficiency and company performance (Mention A.-L. & Bontis N., 2013), value creation measured by sales growth (Díez J.M. et al., 2010), export performance (Pucar S., 2012), job rotation (Brunold J. & Durst S., 2012), organizational culture and climate (Nazari J.A. et al., 2011) or innovation capability (Delgado-Verde M. et al., 2011).

But while research into intellectual capital demonstrated the importance of intellectual capital for modern companies and their shareholders, the current understanding of the nature and role of IC has many gaps. Our paper fills some of them and contributes to the existing literature in the following ways. Firstly, there is a growing body of literature on the impact of ownership structure on company performance as determined by accounting and market measures (Morck R. et al., 1988; Cheng P. et al., 2012). By showing the relationship between ownership structure and intellectual capital efficiency, we provide direct evidence for the substantive role of intellectual capital for various stakeholders. Thus, this study is complementary to the existing literature. Secondly, prior studies on the relationship between ownership structure and intellectual capital or its efficiency were mostly conducted in Asia, hence in different institutional conditions (Chiung-Ju L. et al., 2011; Saleh N.M. et al, 2009; Zanjirdar M. & Kabiribalajadeh A., 2011). Asian countries have not followed the

same kind of transition and privatization which followed Central and Eastern Europe countries. Thus, ownership structures in those countries were shaped in a different way and are dissimilar. This paper ventures to fill these gaps and its purpose is to investigate the relationship between ownership structure and intellectual capital efficiency in the Polish listed companies.

Intellectual capital perspective

The literature provided several definitions of intellectual capital. It is worth mentioning that the term "intellectual capital" is often used interchangeably with the term "intangibles," since virtually all intangibles are of an intellectual origin. L. Edvinsson & M. Malone (1997) defined IC as knowledge that can be turned into value. T. Stewart (1997) proposed that IC consists of knowledge, information, intellectual property and experience which can be utilized to create wealth. Moreover, P. Stahle et al. (2012) mentioned that intellectual capital represents non-physical value for the company, which refers to human, structural and relational capital. Human capital comprises the knowledge, skills, experience and abilities that employees take with them when they leave the company at the end of the day. Some of this knowledge is unique and associated with a particular person or group of people, while some is common and easy to obtain from the market. Examples contain: innovation, creativity, know-how, experience, ability to cooperate, flexibility, ability to deal with ambiguities, motivation, satisfaction, ability to learn, etc. Structural capital is defined as a body of knowledge which stays with the company at the end of the day. It consists of organizational routine, procedures, systems, culture, databases, etc. Some of them can be protected legally and become intellectual property owned by the company exclusively. Relational capital involves the knowledge embedded in the relationship with customers, competitors, suppliers, trade associations and the government (Bontis N., 1999).

The role of intangibles in value creation is a function of their characteristics. B. Lev (2001) explains how the economics of intangible assets works in balancing the benefits and costs associated with this class of assets. Benefits connected with intangible assets can be summarized in the following points: intangible assets, in contrast to material assets, are non-rival (they can be used in several places at a time), they are often characterized by increasing returns to scale due to the large fixed costs of their development and small marginal costs, and they often profit from the network effect, whereby their value increases with the number of users. On the other hand, there are also some factors that limit the growth and value potential of intangibles. These are: difficulties in securing ownership of intangibles due to widespread violations of intellectual property, the high risk connected with the development and commercialization of innovations backed by intangibles and problems with trading intangibles due to limited markets.

Agency problem in dispersed and concentrated corporate governance systems

Since most previous studies were conducted in the United States and Great Britain, where ownership is highly dispersed, agency theory is primarily focused on describing the relationship between top managers and shareholders (Jensen M. & Meckling W.H., 1976). According to this theory, shareholders (principals) delegate their powers to manage companies to managers (agents). The principals and agents seek to maximize their utility, but their objectives differ significantly. The shareholders' objective is to increase the value of their shares. The managers seek to increase their remuneration including perks, and are not always acting in accordance with the expectations of their principals. Studies show that more concentrated ownership in the hands of individual shareholders increases their tendency to monitor managers and motivate them to achieve the owners' objectives more conscientiously. Therefore, ownership concentration is considered as a one of the most effective corporate governance mechanisms (La Porta R. et al., 1998).

In contrast, in continental Europe ownership is concentrated (Becht M. & Röell A., 1999). High ownership concentration creates the principal–principal problem as the largest controlling shareholders enjoy private benefits of control. This gives rise to a conflict of interest between the majority and minority shareholders, which can lead to asset tunneling, i.e., transferring resources out of companies to the controlling shareholders, who may effectively sign contracts with themselves. On the other hand, the presence of large shareholders can mitigate conflicts of interest between the owners and managers, because they are exposed to a greater risk by investing in company shares. Their investments in shares are usually long-term, and, in contrast to the minority shareholders, they cannot "vote with their feet" (Renders A. & Gaeremynck A., 2012). For these reasons, they have a stronger incentive to actively monitor top managers.

Agency theory suggests that ownership structure affects agency problem. Based on this assumption, a number of studies were conducted on the impact of ownership structure on company performance (Bistrova J. & Lace N., 2010; Gadhoum Y. et al., 2005), and on intellectual capital efficiency (Saleh N.M. et al., 2009; Zanjirdar M. & Kabiribalajadeh A., 2011). According to them, shareholders with a substantial stake in companies' ownership get more benefits from monitoring top managers, Hence, they are able to force their interests and affect company performance.

Managerial ownership and intellectual capital efficiency

According to agency theory, managers who hold large blocks of shares begin to behave like shareholders. It mitigates the conflict of interests between the principals and agents (Jensen M. & Meckling W.H., 1976). Thus, some studies investigated the relationship between managerial ownership and company performance. E.g. R. Morck et al., (1988) identified a piecewise-linear relationship between managerial ownership and company performance measured by Tobin's Q in a sample of 371 Fortune 500 companies. They reported an increasing function below 5%, a decreasing one between 5% and 25%, and an increasing one beyond 25%. P. Cheng et al. (2012) conducted research on a sample of Hong Kong listed companies and found that managerial ownership has an "entrenchment-alignment-entrenchment" effect on company performance, i.e., managerial ownership mitigates the agency conflict and positively affects the company performance at a wide medium ownership range from 22.18% to 78.02%. At very low and very high levels of managerial ownership the impact is negative. But in contrast L. Warrad et al. (2013) examined the relationship between managerial ownership and company performance measured by accounting and market measures in Jordanian non-financial listed companies. They found that these two measures bring different results. Managerial ownership does not have a significant effect on return on assets and return on equity, but the largest managerial blockholders do have a significant effect on Tobin's Q. L. Warrad et al. reported that their results seem to be linked to the reputation effect and lower agency costs in Jordanian companies rather than to market fundamentals pertaining to the companies' actual performance.

Based on both the assumptions of agency theory and the results of previous studies, it may be assumed that higher managerial ownership improves corporate value and competitive advantage due to a more effective use of company resources, including intellectual capital, and thus contributes to increased efficiency. For these reasons, the first research hypothesis can be formulated as follows:

H1: Managerial ownership is positively correlated with intellectual capital efficiency.

Foreign ownership and intellectual capital efficiency

Foreign investment in developing countries initially improves the competitive ability of companies, leads to the implementation of new technologies and increases company performance (Goedhuyes M., 2007). Similarly, S. Djankow & B. Hoekman (2000) concluded that the acquisition of a company by foreign investors increases its productivity. Hence, N. Aydin et al. (2007) examined performance differences between foreign and domestically owned Turkish listed

companies. Their results showed that companies with foreign ownership outperform domestically owned companies in respect to return on assets. They concluded that the positive influence of foreign ownership on company performance is the effect of transferring new technologies, generating savings on operating expenses and better monitoring abilities. A similar study was conducted by F. Kimura & K. Kiyota (2007) on Japanese companies. They found that foreign-owned companies exhibit faster growth in profitability and productivity. F. Kimura & K. Kiyota suggested that foreign investors bring useful firm-specific assets such as technology, managerial abilities, and effective corporate governance. But D. Greenaway et al. (2012) examined a panel of 21,582 Chinese firms over the period 2000–2005 found that joint-ventures perform better than wholly foreign-owned and purely domestic firms. They underlined that although productivity and profitability initially rise with foreign ownership, they start declining once it reaches a certain point.

Similarly, I. Iwasaki et al. (2010) scrutinized the effects of ownership transformation in Hungary and found that foreign investors had a positive impact on company performance. They gave support to the notion that foreign investors provide the acquired companies with sophisticated expertise, including management know-how and production technologies created in developed countries. Moreover, foreign-owned companies have greater access to new markets and new capital resources. In contrast, R. Lensink & I. Naaborg (2007) found the opposite relationship and highlighted higher agency costs associated with the distance between principals and agents. Hence, our next hypothesis reflects this ambiguity in the literature:

H2: Foreign ownership affects intellectual capital efficiency.

State ownership and intellectual capital efficiency

The effect of state ownership on intellectual capital efficiency is yet another important factor for consideration. Some authors examined differences in efficiency between private and state-owned companies. Most of them concluded that state-owned companies are less efficient and profitable than privately-owned companies (Majumdar S.K., 1996; Megginson W.L. & Netter J.M., 2001). Some scholars attribute this state of affairs to the self-interest of politicians and officials, who make efforts to take advantage of and maintain power (Cuervo A. & Villalonga B., 2000). Politicians are agents appointed through political elections and the public is their principal. To maintain power, they must behave in accordance with social expectations and avoid conflicts with various stakeholders, even at the cost of company performance. In this respect, of importance are observations of K.D. Brouthers et al. (2007), who noted that in state-controlled companies managers are less likely to engage in innovative and entrepreneurial behaviors. Also R. Frydman et al. (1999) investigated state-owned and privatized companies in the Czech Republic, Hungary and Poland. They reported that privatized companies performed better than state-owned ones. Similarly, M. Alfaraih et al. (2012) scrutinized the relationship between state ownership and company performance in companies listed on the Kuwait Stock Exchange and found a negative correlation. According to them, government ownership tends to prioritize political goals rather than business ones and lacks an adequate entrepreneurial drive.

In contrast, V.T. Le & T. Buck (2011) reported a positive association between state ownership and company performance in Chinese companies. These findings show that in a special institutional environment, where the state is able to use its power through the manipulation of administrative mechanisms, the government can positively stimulate managers and reduce agency costs. Also V.T. Le & A. Chizema (2011) supported this view and mentioned that in China investors are eager to get involved in companies with high state ownership. V.T. Le & T. Buck (2011) observed, however, that China is exceptional and unlike other transition countries because it has transformed its economy without political change, and the weaknesses of the Chinese system of corporate governance are overcome by guanxi, i.e., the use of personal networking by senior managers. On this basis of the above findings, it can be assumed that:

H3: State ownership is negatively correlated with intellectual capital efficiency.

Institutional investors and intellectual capital efficiency

Institutional investors seem to be increasing their holdings both in terms of size and ownership concentration. Hence, sometimes these investors are perceived as having the ability and incentive to monitor and discipline top managers (Ping Z. & Wing C., 2011) or exercise influence through activism that successfully pressures companies to make appropriate long-term investments (David P. et al., 2001). On the other hand, the involvement of institutional investors in ownership often appears to be uncommitted (Tilba A. & McNulty T., 2013) or these investors rarely develop a long-term relationship with investee companies (Webb R. et al., 2003). In light of the above, the results of prior studies which explored the relationship between institutional ownership and company performance are ambiguous. In many cases, it was possible to support the hypothesis of a positive impact of institutional ownership on company performance and also on innovation. For example, E. Elyasiani & J. Jia (2010) scrutinized the relationship between company performance and institutional ownership stability in the United States. They found that stable institutional ownership is indeed associated with better company performance. They argued that the importance of institutional stability is due to the fact that institutional investors who hold stocks for a longer period of time have more opportunities to learn about the company and greater incentives to effectively monitor it.

Similar research was conducted in emerging market countries. M. Alfaraih et al. (2012) examined the influence of institutional ownership on Tobin's Q and ROA in a one-year sample of companies listed on the Kuwait Stock Exchange and found a positive relationship between them. They argued that institutional investors play a powerful and influential role in terms of corporate governance mechanisms in this country. Also B. Barzegar & K.N. Babu (2008) scrutinized the relationship between institutional ownership and ROA, ROE and Tobin's Q in companies listed on the Tehran Stock Exchange. Their study supported a positive relationship between them.

On the other hand, there were also some studies which did not support the hypothesis of the positive influence of institutional ownership on company performance. C. Rose (2007) conducted research on the influence of institutional ownership on company performance measured by Tobin's Q in Danish companies. He showed that while aggregate institutional ownership does not affect company performance, ownership by banks and insurance companies has a significant positive impact on it. In contrast, in C. Rose's study joint ownership by the largest two investors was shown to have a significant negative impact. Similarly, R. Duggal & J.A. Millar (1999) examined the relationship between institutional ownership and company performance in American companies. They concentrated on bidder returns and did not see any evidence that active institutional investors have superior monitoring abilities. Since institutional ownership is strongly affected by the legal environment, these results suggest that the relationship between institutional ownership and company performance is ambiguous and careful analysis is needed. Since the nature of the relationship between institutional ownership and company performance remains unclear, we put forth the following hypothesis:

H4: There is a relationship between institutional investor ownership and intellectual capital efficiency.

Research methodology

Sample selection and variables

The sample utilized in this study consists of Polish companies listed on the Warsaw Stock Exchange between 2006 and 2011. Data are derived from the Amadeus database and annual financial reports. The sample involves only non-financial companies. Financial institutions are excluded due to their unique financial structure and special accounting

rules for the financial sector. Following S. Firer & S.M. Williams (2003), we eliminated companies with negative book value of equity or negative structural capital, and at the same time negative value added calculated for the needs of the value added intellectual coefficient (VAIC™), which was a dependent variable. Observations with missing data were also rejected. This led to an unbalanced initial panel sample of 354 companies and 1,505 company-year observations. To alleviate the influence of outlying values, extreme observations were excluded by rejecting the top and bottom 1% of observations for each dependent variable.

To test our hypothesis, we employed four dependent variables, i.e., intellectual capital efficiency as measured by the value added intellectual coefficient (model 1), human capital efficiency (model 2), structural capital efficiency (model 3) or capital employed efficiency (model 4). Since our data covered several years, they were subjected to panel data analysis.

Following A. Pulic (2000) and S. Firer & S.M. Williams (2003), we employed a value added intellectual coefficient (VAIC™) as a proxy for intellectual capital efficiency. The VAIC, which is a financial valuation method, consists not only of intellectual capital efficiency, but also of capital employed efficiency. Capital employed comprises both physical and financial capital. However, initially three components were calculated, i.e., human capital efficiency (HCE), structural capital efficiency (SCE) and capital employed efficiency (CEE). The components are given as efficiency rates using value added (VA) measurement. Subsequently, the VAIC was calculated. The general formula takes the form of:

$$VAIC^{TM} = HCE + SCE + CEE$$

The different efficiency rates and the value added rate are calculated using the following formulas:

- Human capital efficiency: HCE = VA/HC
- Structural capital efficiency: SCE = SC/VA
- Capital employed efficiency: CEE = VA/CE
- Value added: VA = OP + HC + D +A

where: HC – labor costs (salaries and employee benefits), SC – amount of structural capital, (SC = VA – HC), CE – book value of net assets, OP – operational profit, D + A – depreciation and appreciation.

The variables were based on theoretical and empirical arguments from the previous literature. Four different instrumental variables were used for ownership, i.e., managerial ownership (ownership by management board members), foreign ownership, state ownership and institutional (financial) ownership. Similar variables describing ownership structures were used in previous studies (Saleh N.M. et al., 2009). Ownership variables are all calculated as direct and indirect voting rights at the general meeting. Moreover, thanks to data availability (after exceeding this threshold, shareholders are required to make the data available to the public) only blocks of shares in excess of 5% of the total were included. For the calculation of the managerial ownership variable, also the shares owned by the family members of managers were taken into account. We believe that such a situation strengthens their position in the company and the opportunity to influence the efficiency of intellectual capital. Foreign ownership was taken to include both foreign companies and individuals, but the sample was overwhelmingly dominated by the former. In the case of the state ownership variable, indirect ownership through institutional (financial) investors was not accounted for, but indirect ownership through government-controlled companies was. Finally, the group of institutional (financial) investors included Polish and foreign banks, insurance companies, brokerages, open-end pension funds, open-end and closed-end investment funds, and venture capital and private equity funds.

The choice of control variables was motivated by their potential relevance. The factors controlled for include company size, debt ratio, free float, growth opportunity and industry. Since company performance is associated with company size, total assets are used to control for the latter. As is common practice, these data are transformed by natural logarithm.

Company leverage is controlled for by the debt ratio, calculated as the ratio of total liabilities to total assets. This control variable is of particular importance in assessing corporate performance because it is affected by capital structure. This has implications for the cost of capital and investors' perceptions of the risk of investing in companies with different levels of debt. Moreover, company leverage helps to reduce the agency conflict through additional monitoring by creditors, which can boost company performance. However, in contrast to the agency theory, the pecking order theory assumes a negative association between leverage and company performance (Liang Ch.-J. et al., 2011).

The industry variable is used to control for the company sector. This is a dummy variable, which is equal to 1 for industrial companies and 0 otherwise.

Descriptive statistics

Table 1 shows descriptive statistics for the variables considered. The value added intellectual coefficient is 2.8515, which is slightly higher than the value reported in a study by N.M. Saleh et al. (2009), where it amounted to 2.019. This shows that the effectiveness of intellectual capital of Polish listed companies seems to be higher than that of Malaysian companies in a similar study. Human capital efficiency is lower and amounts to 1.9413, as compared to 2.221 in the study by N.M. Saleh *et al*. Structural capital efficiency is higher and amounts to 0.3494, as compared to -0.202. Capital employed efficiency is also higher, i.e., 0.5342 against 0.043 in the quoted study. These differences may result from a different structure of the sample as well as from the time of observation. The VAIC is not entirely free from the influence of the macroeconomic situation (Urbanek G. & Bohdanowicz L., 2011), which may affect its value for the entire sample, but not for intercompany differences.

Moreover, the mean values of the variables describing ownership structure were 0.0863 for foreign ownership, 0.1236 for institutional ownership, 0.0265 for state ownership and 0.1905 for managerial ownership. It is worth noting that the median was higher than 0 only for institutional ownership, which indicates that these investors hold shares in a large number of companies, while their blocks are usually small since the mean is lower than that for board members and only slightly higher than that for foreign investors. State ownership is the least common in the Polish public companies but the Polish State Treasury has considerable holdings in the largest and most important sectors of the economy including the chemical, mining, and power industries.

The mean free float in our sample is 0.3650. The average debt ratio is 0.4703. The mean natural logarithm of total assets, i.e. company size, is 19.3423. The mean market-to-book ratio, that is growth opportunity, is 1.2199

Table 1

Descriptive statistics

Variable	Mean	Median	Standard deviation	10th percentile	90th percentile
Value added intellectual coefficient	2.8515	2.6246	1.6337	1.4846	4.5591
Human capital efficiency	1.9413	1.5994	1.2598	1.0348	3.2581
Structural capital efficiency	0.3494	0.3790	0.3378	0.0513	0.7030
Capital employed efficiency	0.5342	0.4544	0.3678	0.1798	0.9754
Foreign ownership	0.0863	0.00	0.2071	0.00	0.5000
Institutional ownership	0.1236	0.0639	0.1637	0.00	0.3306
State ownership	0.0265	0.00	0.1159	0.00	0.00
Managerial ownership	0.1905	0.00	0.2696	0.00	0.6599
Debt ratio	0.4703	0.4730	0.1957	0.2258	0.7007

Company size	19.3423	19.2358	1.6629	17.3973	21.3858
Growth opportunity	1.2199	1.7692	1.6559	0.4851	3.7358
Free float	0.3650	0.3332	0.1871	0.1578	0.6447

Source: authors' calculations.

Hypothesis verification

Table 2 illustrates the results of panel data estimation for the sample. Model 1 shows the influence of independent and control variables on the value added intellectual coefficient (VAIC), while other models present its influence on the VAIC components, i.e., model 2 on human capital efficiency (HCE), model 3 on structural capital efficiency (SCE), and model 4 on capital employed efficiency (CEE).

The results revealed that the interaction between managerial ownership and the VAIC was negative and significant (β = -0.6087, $p < 0.05$). In order to provide more in-depth analysis, it was also checked whether this type of ownership had any moderating effects on the VAIC components. The results did not show any significant impact on human capital efficiency or capital employed efficiency, but did show a negative and significant correlation with structural capital efficiency (β = -0.1388, $p < 0.05$). These results are contrary to Hypothesis 1, which, according to agency theory, predicted a positive relationship between these variables.

The interaction between foreign ownership and the VAIC components was found to be negative and significant for capital employed efficiency (β = -0.2241, $p < 0.05$). In turn, the results did not show any correlation between foreign ownership and the VAIC, human capital efficiency or structural capital efficiency. The only relationship identified was a negative one between the VAIC and capital employed efficiency.

Our analyses identified several correlations between some dependent and control variables, including a relationship between the VAIC and company size (β = 0.3195, $p < 0.001$), free float (β = -1.0240, $p < 0.05$), growth opportunity (β = 0.1051, $p < 0.001$) and sector ($p < 0.1$). Human capital efficiency is correlated with the debt ratio (β = -0.5748, $p < 0.5$), company size (β = 0.2734, $p < 0.001$), free float (β = -0.9022, $p < 0.01$), growth opportunity (β = 0.2059, $p < 0.001$), and sector ($p < 0.001$). We also found associations between structural capital efficiency and company size (β = 0.0782, $p < 0.001$), free float (β = -0.9022, $p < 0.01$) and growth opportunity (β = 0.0282, $p < 0.001$). The last dependent variable, i.e., capital employed efficiency is correlated with the debt ratio (β = 0.7894, $p < 0.001$) and growth opportunity (β = 0.0600, $p < 0.001$).

Table 2

Panel data estimation of ownership structures and intellectual capital efficiency

Independent and control variables	**Dependent variables**			
	Model 1 Value added intellectual coefficient (VAIC™)	**Model 2** Human capital efficiency (HCE)	**Model 3** Structural capital efficiency (SCE)	**Model 4** Capital employed efficiency (CEE)
Managerial ownership	-0.6087* (0.2921)	-0.0508 (0.1975)	-0.1388* (0.0632)	-0.0612 (0.0444)
Foreign ownership	0.0067 (0.6056)	0.0894 (0.4092)	-0.0020 (0.1315)	-0.2241* (0.0907)
State ownership	0.0859 (1.1127)	-0.3173 (0.7516)	0.1760 (0.2406)	0.0640 (0.1708)
Institutional ownership	-0.1354 (0.4329)	-0.2251 (0.2929)	-0.0181 (0.0934)	0.0943 (0.0640)

Debt ratio	0.1311 (0.3660)	-0.5748* (0.2373)	-0.1088 (0.0775)	0.7894*** (0.0556)
Company size	0.3195*** (0.0700)	0.2734*** (0.0476)	0.0782*** (0.0137)	-0.0111 (0.0093)
Free float	-1.0240* (0.4072)	-0.9022** (0.2795)	-0.1695† (0.0907)	0.0695 (0.0614)
Growth opportunity	0.2059*** (0.0340)	0.1051*** (0.0227)	0.0282*** (0.0074)	0.0600*** (0.0052)
Sector	Yes†	Yes***	No	No
Constant	-2.2520 (1.5120)	-1.8090† (1.0071)	-0.9268** (0.3013)	0.3314† (0.2009)
N	1454	1450	1450	1460
Adjusted R-squared	0.6781***	0.7571***	0.6411***	0.8477***

*Note: † p < 0.1; * p < 0.05; ** p < 0.01; ***p < 0.001. Standard error is given in brackets.*

Source: authors' calculations.

Conclusions and summary

Since intellectual capital is recognized as an important determinant of competitive advantage, it is essential to examine the possibilities of improving its effectiveness. In view of this, we investigated the relationship between ownership structure and intellectual capital efficiency.

A negative relationship was found between managerial ownership and the value added intellectual coefficient. Moreover, this type of ownership has a negative impact on structural capital efficiency. These findings stand in contrast to studies on the relationship between managerial ownership and company performance and also to the fundamental assumptions of agency theory. This may be due to the specific nature of ownership structures in developing countries. In developing countries, companies' founders are often the owners of large blocks of shares and in many cases they also manage companies. They may not have the knowledge about how to manage intellectual capital, especially in traditional sectors, where managers have to compete with oligopolistic structures in mature industries.

Also a negative correlation was established between foreign ownership and capital employed efficiency. These findings are not consistent with the results of some previous findings (e.g. Aydin N. et al., 2007). We believe that such a relationship in our sample could be the result of the structure of foreign shareholders in Poland, which are primarily strategic investors, i.e., foreign companies. While in the period immediately following privatization the sale of companies to foreign investors resulted in great advantages, such as capital injections and know-how transfer, in the long term Polish companies appear to serve as tools in their parent companies' strategies of maximizing value at the level of the holding. This can be done at the expense of minority shareholders and the development of individual domestic companies.

The results of the presented study are subject to limitations associated with the measurement of variables and the method used. The first limitation concerns the endogenous variable. Although the VAIC is easy to calculate and is based on audited financial data, which allows its use for intercompany comparisons, it does have a number of drawbacks that limit its applicability as a fully objective measure (Andriessen D., 2004). However, its simplicity and the fact that calculations are based on readily available and comparable data make the VAIC a proxy variable that is frequently used in studies on intellectual capital efficiency. The second limitation concerns the relationship between endogenous and instrumental variables. While according to some authors these relationships are non-linear, in this study we assume that they are linear. Non-linear relationships could be the subject of further research. A third limitation relates to the

measurement of ownership variables. Shareholders have to report the size of their holdings publicly if they exceed the 5% threshold. For this reason, the presented study considers only such blocks of shares.

Our research indicates possible directions and areas for further research. First, it may be important from the point of view of emerging markets to examine the relationship between the intellectual capital efficiency of parent companies based in developed countries and that of their subsidiaries in developing countries. Such research would help identify the strategies of multinational corporations in relation to the places where the performance effects of intellectual capital arise. From the point of view of developing countries, the study results could provide evidence for or against a policy of encouraging multinational corporations to invest in intellectual capital. Second, the endogenous variable used in the presented study, the VAIC, is not devoid of drawbacks. In further studies, other measures should be used to evaluate intellectual capital efficiency. But this will be possible only if comparable data are accessible.

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THE IMPACT OF REMOTE WORK INTENSITY ON PERCEIVED WORK-RELATED OUTCOMES IN ICT SECTOR IN LATVIA

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Abstract. There is an increasing demand for skilled professionals in the information and communication technology (ICT) sector in both Latvia and globally, therefore it is imperative to seek and introduce new methods of work organization that could help retain or even to attract potential employees. Remote work as one of the forms of flexible work is a modern way to adjust to ever changing needs of both employees and organizations, yet the impact of remote work intensity on work-related outcomes has not been sufficiently studied. Based on the analysis of scientific research literature, statistical data and the data collected from Latvian ICT sector employee online survey, the aim of the paper was to study the impact of remote work intensity on employee perceived productivity, job satisfaction and organizational commitment to suggest best practices for adapting and adjusting remote work policies.

Employees working regularly remotely at least once a week from 48 Latvian ICT sector organizations participated in the survey. Data was analyzed using linear and hierarchical regressions and the results of the survey revealed that remote work intensity is positively related to the productivity of individual workers. However, no significant relationship was found between remote work intensity and either job satisfaction or organizational commitment as well as autonomy, employee-manager and employee-co-worker relationship quality. Negative association was found between remote work intensity and work-life balance, while lower work-life balance was found to negatively affect job satisfaction and organizational commitment. In addition, significant positive relationships were found to exist between autonomy and quality of the employee-co-worker relationship predicting productivity, job satisfaction and organizational commitment, as well as employee-manager relationship quality was found to be associated with higher levels of organizational commitment and job satisfaction. The findings will contribute to the remote work literature and help to implement and manage remote work practices.

Key words: *job satisfaction, organizational commitment, productivity, remote work, telework*

JEL code: M15, L25

Introduction

Statistical data shows that organizations, especially those in information and communication technology (ICT) sector, lack skilled and qualified workforce, due to both demographic factors and the rapid development of new technologies to which many potential employees cannot adapt to and these shortages are expected to continue in the foreseeable future and may be observed not only in Latvia, but worldwide as well (EURES, The European Job Mobility Portal, 2016; Ministry of Economics of the Republic of Latvia, 2016). The demand and supply in the labor markets are not in equilibrium, and organizations have to think more than ever about how to retain their best employees and attract new ones. To ensure the job satisfaction, increase productivity and foster organizational commitment, managers have to seek for and implement new work organization methods. In addition, organization's labor resource and overall cost-

effectiveness is always of importance. In this paper authors suggest that one of the possible solutions could be the implementation of remote work - one of the forms of flexible work organization. However, it is not clear how exactly remote work intensity - hours or days per week spent working remotely - affect employee's productivity, job satisfaction and organizational commitment. Overall, there is a limited number of research on this problem in scientific literature and there is no information available if such research has been conducted in Latvian organizations. In order to successfully plan, organize and manage remote work policies in organizations, a study on remote work intensity is required that would help to understand how changes in remote work intensity affect work-related outcomes for employees who spend different amount of time performing their duties outside the organization premises.

The **aim of the paper** is, based on the analysis of scientific literature, statistical data on the prevalence of remote work and Latvian ICT sector, and analysis of the Latvian ICT sector organization employee survey results, to assess how the remote work intensity impacts perceived job satisfaction, productivity and organizational commitment of the employees, and to develop proposals in order to better adapt or introduce remote working practice in organizations.

According to the aim of the paper, the following **tasks of the research** have been set:

- To overview the results of previous research of various authors on remote work and work-related outcomes and use the findings, and choose the most appropriate theoretical model to justify the stated research problem.
- Survey the organizations and gather information on the prevalence of remote work in Latvian ICT sector organizations.
- Carry out a survey of the remotely working employees of ICT sector organizations to evaluate the employee opinion on remote work and to assess how the remote work intensity impacts perceived job satisfaction, productivity and organizational commitment.
- Analyze the results and compare them with the results of study carried out by Solomon G. Nyaanga.

Research methods - to analyze data gathered during the research and verify the hypotheses put forth by Nyaanga, linear and hierarchical regression analyses were used. Additionally the following research methods have been applied: descriptive statistics, analysis of scientific literature and statistical data. Internet survey has been conducted to find out the self-assessment of the work-related outcomes of the remotely working Latvian ICT sector employees.

Research period - survey was conducted between November 2016 and January 2017.

Characterization of the literature and data sources - paper was based on scientific literature, various publications of research articles, as well as Internet-based materials and online survey data of the ICT sector organization employees. Research articles published by Golden, Harrison and Gajendran were predominantly used. The empirical part of the study is based on Solomon G. Nyaanga's doctoral thesis.

Object of the research - ICT sector.

Subject of the research - impact of remote work intensity.

Delimitations of the research - due to limited time and data availability the object of the research is narrowed, and the study mainly analyzes data of the ICT sector organization employees that work remotely.

Theoretical Discussion

Remote work that in the scientific literature is commonly referred as telecommuting, virtual work, mobile work etc. is not a new form of work organization. Although there is an increasing number of studies that focus on remote work and

work-related outcomes (Allen, et al., 2015; Hurd, 2010; Poissonnet, 2002; Khaifa & Davidson, 2000) that can be attributed to increasing popularity of remote work, the idea of remote working has long-established origins. Over time there have been developed and updated various definitions of remote work that creates different understanding of remote work concept.

Since both in the scientific literature and in the practice there can be found different definitions of the remote work that represent different concepts and various types of remote work, its derivatives and organizational forms, authors propose to formulate a definition of remote work to form a common understanding of the concept of remote work within the scope of this paper. Based on the analysis of scientific literature, authors propose the following definition: remote work is a form of an elastic work organization that provides the possibility for the employees of an organization to freely choose the place where the work is conducted from, by using information and communication technologies, this way partly or fully substituting office hours that would otherwise be spent on the premises of the organization in the primary workplace. To dissociate remote work from the other types of this work form authors exclude working in organization's satellite offices, that are located in geographically different locations within the confines of the organization's country of origin or outside of it (for example, organization's regional offices). Also, in the context of this paper, only those employees who have contract of employment with the organization and who remotely perform their duties during the paid working hours are considered as remotely working employees. In this paper the definition of remote work is limited to knowledge workers only.

Remote work can affect work-related outcomes differently - it can change individual's job satisfaction, organizational commitment, identification with the organization, impact stress levels, performance, affect the salary and so forth. Such work-related outcomes as productivity, job satisfaction and organizational commitment in the scientific literature have been emphasized the most in the context of remote work, justifying the importance both from the employee's and the organization's viewpoint.

When considering the implementation of remote work policy, possible changes in productivity are substantially essential - for the organization to be interested in supporting remote work, gains from it have to outweigh the losses or costs associated with supporting the conduction of work remotely - that is, managers have to be confident that the productivity will increase as a result of remote work, or at least will not decrease. Various different factors influence accomplishment of the tasks and not every job is suited to be performed remotely. The elasticity of remote work requires an individual to be with higher sense of responsibility and better self-organization skills, so that the job that required frequent communication with colleagues could be carried out as effectively without being physically close to other employees etc. When working remotely the environment of the workplace may not be suitable for the job, or it may contribute to more interruptions, so it is important to assess the potential benefits (for example, productivity gains) from the remote work in a particular work context. For example, Dutcher (2012) showed in an experiment that remote work influences employees productivity depending on the type of work - productivity decreased 6-10% when performing boring, dull and monotonous work, but increased 11-20% when performing creative work. Whereas Butler, Aasheim and Williams (2007) for 5 years studied the impact of remote work on the productivity of employees of the company "Kentucky American Water", that provides services for 280 000 clients in USA. Findings of the study revealed that working remotely increased employee productivity and that this increase was sustained over a long period. Similar experiment was carried out in a Chinese tourism agency "CTrip" that employs 16 000 employees (Bloom, et al., 2015). The employees of the call center who volunteered to participate in the experiment, for 9 months were randomly split

between those who work remotely and those who continued to work in the office. Work from home resulted in 13% performance increase, 9% of that was attributed to more minutes worked per shift - due to fewer interruptions and less frequent sick leave - and 4% from more answered calls per minute, that was associated with quieter and more comfortable work environment. Overall, examined studies have shown that the remote work most often positively affects productivity growth.

In the scientific literature it is established that organizations measure productivity by evaluating the ratio between the invested resources (time, finances and human resources) and return of these resources. The authors of this paper have chosen to analyze the impact of remote work intensity on the ICT sector employees, who, most often, are performing intellectual work, the process of this type of work is difficult to standardize because the work carried out is not uniform and repetitive, hence timing and classifying of the work is challenging. It is difficult to define the result of the intellectual work - most often it is intangible, immaterial, complex, and in turn hard to measure and compare. The quality of the result of intellectual work is a subjective assessment and may vary depending on who is commissioning the work - the organization's defined quality criteria and what is expected by the customer can be entirely different. It should be also noted that a single employee rarely carries out intellectual work alone and it requires the involvement of other specialists and teamwork. The productivity of an employee performing intellectual work is affected by various factors - access to information, its quality, information systems, organization standards and procedures, innovation potential, the employee's knowledge and experience level, work environment, time allocated for the work completion, work organization, division of labor, clarity of the work assignment and objectives, teamwork, knowledge sharing and many others. Considering the previously mentioned obstacles, obtaining the necessary measurements to objectively assess and compare the productivity of the performers of intellectual work might be challenging, thus the changes in productivity levels in the context of this paper have been addressed as employees' subjective self-assessment.

When evaluating the potential gains from implementing remote work policy, no less significant for the organizations is the impact on employee job satisfaction. It affects employee’s motivation, productivity, attitude towards work, etc. Increased job satisfaction can lead to lower levels of stress, foster employee retention, that in turn lowers costs associated with employee turnover (for example, new employee recruitment and training), and can even compel employees to work unpaid overtime and take on additional responsibilities without asking for a salary increase, thus increasing productivity. Study carried out by Fonner and Roloff (2010) shows that high-intensity remotely working employees are much more satisfied than the employees working at the office, mentioning lower work-life conflict as the most influential factor that affects job satisfaction. The study also showed that despite the challenges that are associated with employees working remotely more than half of the time, remotely working employees were still more satisfied than the employees working at the office, that contradicts a study carried out by Golden (2006b), where it was concluded that more intensive remote work may fully diminish its positive impacts on job satisfaction. When evaluating job satisfaction in the context of remote work, one should take into account also the attitude of the employees who remain working and office and do not have the possibility to work remotely, the effect of that is relatively little known and studied. It is possible that employees working in the office may feel deprived, less privileged, and perceive the remote work as a privilege that only the most appraised employees are entitled to. This way, when implementing remote work policy in the organization partially, attention should be paid whether the benefits from remote work outweigh the disadvantages associated with the change in attitude and performance of office employees.

Classical approach to workforce management is associated with control and close monitoring of subordinates, but

organizational commitment encourages employees to be more independent, attend work more regularly and to focus more on the work, require less supervision from the managers and contribute to the employee's willingness to provide more to the organization than is expected from the employee, that in turn facilitates successful implementation of remote work policy. Managers suppose that as a result of remote work, with reduced communication with colleagues and supervisor and less frequently attending the office, connection and identification with the organization for the employee would weaken, that in turn would lead to a decreased performance and loyalty of the remotely working employee. In addition, given the shortage of qualified specialists, particularly in the ICT sector, job satisfaction, loyalty and devotion to the organization as a whole are important to attract new professionals and retain the organization's existing employees. Authors deduce that organizational commitment is an important prerequisite for the remote work and the option to work remotely must not lessen it, therefore it is important to assess how remote work affects employees' commitment to the organization. Piper (2004), using three-dimensional model of commitment developed by Meyer and Allen, as part of his doctoral dissertation, surveyed 4 800 employees from companies of various industries located in southeastern US region, by comparing remotely working and office workers and evaluating how remote work affects organizational commitment. The study concluded that option to work remotely did not increase organizational commitment more than for the employees that did not work remotely. Golden (2006a) concluded that the higher remote work intensity, the higher is employees' organizational commitment and less expressed intentions to change job. Allen, Golden and Shockley (2015) in their research refer to meta-analysis of eight studies performed by Martin and MacDonnell (2012) where they found a small, positive relationship between remote work and organizational commitment, but Hunton and Norman (2010) observed that employees that were granted possibility to freely choose the place where the work is conducted from (work from home, at the satellite office or in the main office - by freely changing the workplace), expressed higher organizational commitment than the other employees. Thus, authors of this paper conclude that remote work does not negatively affect organizational commitment. However, there is no unequivocal answer as to what extent remote work affects the organizational commitment positively, therefore further research is needed, taking into account the impact of remote work intensity.

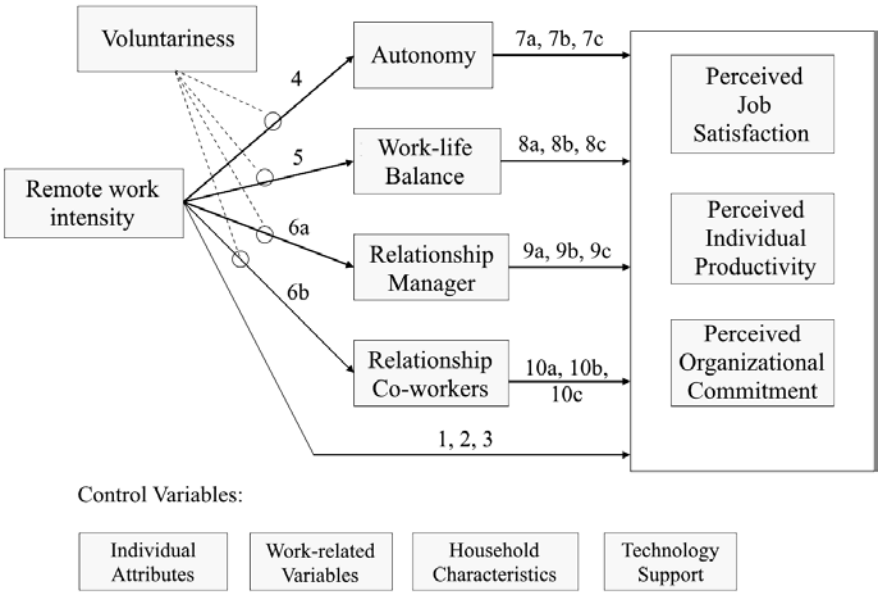
Work conducted by various researchers has been summarized and analyzed to assess the impact of remote work on work-related outcomes. Productivity has been examined as one of the most important indicators related to remote work, as it is important to retain the work output and employee productivity when introducing remote work policy. Another important indicator examined is the organizational commitment, because one of the main challenges when working remotely is the potential decrease in employee identification with the company, making it important to find a way to retain employees and make them loyal. Job satisfaction is related to both previous factors, as satisfied employee is productive and loyal employee. For the employee to retain or increase its productivity, job satisfaction and organizational commitment, research examining the impact of remote work intensity on these factors is still needed.

Research Design

Research is based on the theoretical model developed by Solomon G. Nyaanga (2012) as part of his doctoral dissertation that also included the questionnaire consisting of constructs developed by various other researchers to measure the variables of interest.

The model contains an independent variable - remote work intensity that is defined as the average number of days per week spent working remotely, dependent variables – individual's perceived productivity, organizational commitment and

job satisfaction, mediating variables of work-life balance, relationship with supervisor and co-workers, sense of autonomy, as well as the variable that moderates the relationship between remote work intensity and mediating variables - voluntariness.



Source: Nyaanga S. G., 2012. The Impact of Telecommuting Intensity on Employee Perception Outcomes: Job Satisfaction, Productivity, and Organizational Commitment.

Fig. 1. **Theoretical model developed by Solomon G. Nyaanga**

The authors of this paper studied the relation between the above-mentioned variables as hypothesized by Solomon G. Nyaanga.

The questionnaire consisted of 44 questions, three of questions were open-ended.

Within the study, variables of interest were measured based on the employee self-evaluation, using the Likert scale, where "1" indicated "fully disagree", and "7" – "fully agree".

Cronbach's alpha scale reliability coefficient for all question groups suggests good internal consistency (≥ 0,8), in a few cases even excellent (≥ 0,9), except for the "relationship quality with co-workers" construct, that got acceptable internal consistency rating with coefficient 0,76. Cronbach's alpha coefficient obtained in theoretical model author's (Solomon G. Nyaanga) work was 0,824.

Research Results and Discussion

Between November 2016 and January 2017, selecting survey participants from the Lursoft database using NACE codes relevant to ICT sector, 1046 Latvian ICT sector organizations were addressed for determining whether remote work is practiced in the organization; a survey of the employees was carried out to evaluate the employee opinion on remote work and to assess how the remote work intensity impacts perceived job satisfaction, productivity, organizational commitment and other factors.

Overall, 129 organizations confirmed that they practice remote work (both regularly and irregularly), but 117 organizations pointed out that they do not practice remote work. Precise data on regular and irregular distribution of remote work practice is not available, however, from the organization's replies it can be concluded that irregular remote

work between surveyed organizations is more common. The main reasons mentioned by organizations why remote work is not being practiced are: dynamic communication is required; instant feedback and action; work carried out by the organization cannot be done outside the organization's facilities; information and data security; required increased control of employees; management of the organization does not support such flexible forms of work organization, as they believe that the work carried out working remotely is less productive; remote work is suitable only for small, clearly definable and measurable work; management's opinion is impacted by negative previous experience. Main reasons why remote work is practiced regularly as stated by organizations surveyed: reduced direct and indirect costs; employee time savings on the account of commuting between home and workplace; convenience; company's position that only the overall work results and achievement of goals is of importance, not the tools used to achieve it.

108 part-time and full-time remotely working respondents from 48 Latvian ICT sector organizations took part in the employee survey. The survey results show that on average 1 day per week remotely work 31,5% of employees, 2 days per week - 13,0%, 3 days - 10,2%, 4 days - 14,8%, but all workdays work remotely 30,5% of employees. On average survey respondents remotely work 3,00 days per week, median - 3 days, standard deviation - 1,67.

According to the theoretical model, 10 hypotheses put forth by Nyaanga and linear relationship between remote work intensity and perceived work-life balance were tested using linear regression analysis.

A statistically significant positive linear relationship was found to exist between remote work intensity and productivity. No linear relationship was found between remote work intensity and job satisfaction, organizational commitment, sense of autonomy, or quality of relationships with co-workers or supervisor. However, increased remote work intensity led to lower levels of perceived work-life balance. In turn, decreased work-life balance resulted in lower levels of job satisfaction and organizational commitment. The study also revealed that the sense of the autonomy of remotely working employees is positively related to job satisfaction, productivity and commitment. The relationship quality between employees and supervisors is also of significance, as it was positively related to higher levels of job satisfaction and commitment; but higher relationship quality between employees and co-workers resulted in not only higher levels of job satisfaction and organizational commitment but increased the perceived productivity as well. For full results of the linear regression analysis see Table 1.

Table 1

Summary of the linear regression analysis results - All hypotheses

Independent variable	Dependent variable	const	B	SE B	β	R^2	p
Remote work intensity	Productivity	4.407	0.232	0.075	0.286	0.082	**.003**
Remote work intensity	Job satisfaction	6.189	-0.015	0.051	-0.029	0.001	.766
Remote work intensity	Organizational commitment	5.802	0.013	0.066	0.020	0.000	.840
Remote work intensity	Autonomy	5.946	0.030	0.054	0.054	0.003	.576
Remote work intensity	Decrease in work-life balance *	2.359	0.201	0.083	0.229	0.053	**.017**
Remote work intensity	Employee-supervisor relationship quality	5.992	-0.003	0.056	-0.006	0.000	.953

Independent variable	Dependent variable	const	B	SE B	β	R^2	p
Remote work intensity	Employee-co-worker relationship quality	5.297	0.111	0.060	0.177	0.031	.068
Autonomy	Job satisfaction	3.815	0.386	0.083	0.411	0.169	**.000**
Autonomy	Productivity	3.354	0.290	0.139	0.198	0.039	**.040**
Autonomy	Organizational commitment	2.515	0.551	0.106	0.449	0.202	**.000**
Decrease in work-life balance *	Job satisfaction	6.639	-0.167	0.055	-0.282	0.079	**.003**
Decrease in work-life balance *	Productivity	4.749	0.119	0.089	0.129	0.017	.183
Decrease in work-life balance *	Organizational commitment	6.405	-0.190	0.073	-0.245	0.060	**.011**
Employee-supervisor relationship quality	Job satisfaction	2.985	0.528	0.071	0.587	0.344	**.000**
Employee-supervisor relationship quality	Productivity	4.013	0.182	0.135	0.130	0.017	.180
Employee-supervisor relationship quality	Organizational commitment	1.793	0.677	0.093	0.576	0.331	**.000**
Employee-co-worker relationship quality	Job satisfaction	4.234	0.339	0.074	0.408	0.166	**.000**
Employee-co-worker relationship quality	Productivity	3.513	0.282	0.123	0.218	0.048	**.023**
Employee-co-worker relationship quality	Organizational commitment	3.551	0.407	0.098	0.375	0.140	**.000**

** Due to inconsistency of the work-life balance construct in the questionnaire developed by Nyaanga, higher levels actually indicate decrease in work-life balance.*

Source: authors' calculations based on empirical results

The last part of the questionnaire contained 3 open-ended questions on the impact of remote work on work-related outcomes. Answers were given by 71 respondents. In the opinion of the authors of this paper, to reach the objective of this study, quantitative analysis of results is sufficient, that contains all the variables of interest as included in the theoretical model developed by Nyaanga. However, most of the respondents have provided insightful answers to some of the open-ended questions, that contain valuable additional information in the context of remote work research, therefore, the authors compiled answers and analyzed them separately from the quantitative research. The results show factors that should be paid attention to when introducing remote work practice in the organization.

Table 2 sums up the most frequently mentioned advantages and disadvantages of remote work; the results correspond with the conclusions of other researchers (Allen, et al., 2015). Similar results were found in the survey on remote work carried out by TNS in May 2015. In conclusion, advantages were mentioned more frequently, whereas the number of various disadvantages is higher.

Table 2

The most frequently mentioned advantages and shortcomings associated with remote work in the open-ended questions of the questionnaire (frequency of occurrence mentioned in the brackets)

Advantages	Shortcomings
Work-life balance improvement (14)	Lack of employer payment for computing and telecommunications equipment and services used for remote work (5)
Time economy of the account of time spent commuting (23)	Conflict between work and private life (6)
Avoidance of bad weather conditions (2)	Focus and self-control problems due to the lack of self-motivation (2)
Eluding traffic congestions (3)	Social and professional isolation (6)
Flexibility in the planning of working time and choosing the workplace (33)	Lower quality of the communication with the colleagues (8)
Better employee on-demand availability (due to reduced interruptions caused by commuting and alike) (1)	Lack of oral informal knowledge sharing with colleagues (2)
Money saved on commuting expenses (5)	Reduced sense of belonging to the organization (1)
Reduced environmental impact and lower levels of social stressors (10)	Physical inaccessibility of documents (1)
Increased productivity (48)	Insufficiently clear and detailed job task descriptions (1)
Home-made meal (1)	Encumbered delivery of work results (1)
Possibility to combine main job with additional side work (2)	Mandatory meetings in the organization office (1)
Increased sense of autonomy (11)	Lack of socialization with colleagues (3)
No need for formal clothes and groomed appearance (1)	Encumbered decision making (1)
Additional opportunities to help other colleagues (1)	Lack of physical assistance from colleagues (1)
Individually arranged and comfortable working environment (5)	Employer is not aware of the employee's current load (1)
Virtual meetings (1)	Environmental and social stressors (3)
Trust of the employer (1)	Sedentary and unhealthy lifestyle risk (2)
	Additional work after formal working hours (2)
	Difficulties with reaching colleagues simultaneously (1)

Advantages	Shortcomings
	Lack of creativity and spontaneity of ideas (1)
	Decreased productivity (11)

Source: authors' calculations based on empirical results

The most frequently mentioned benefits and opportunities associated with remote work were the flexibility in planning working hours and choosing the place of work, improvement of the work-life balance, time economy, autonomy, as well as reduced environmental impact and lower levels of social stressors.

The most frequently mentioned disadvantages associated with remote work were decreased quality of the communication with the colleagues, work-life conflict, social isolation, lack of compensation for computing and telecommunications equipment and services used for remote work, environmental and social stressors.

Given that some of the factors were mentioned both as an advantage and a shortcoming (e.g. productivity, work-life balance, environmental and social stressors), one needs to carefully examine employee needs and organization goals when implementing remote work policies, choose employees that are most suited for remote work and to assess whether the benefits from remote work outweigh the challenges associated with it.

Conclusions

1. In the scientific literature there is no common understanding of the concept of remote work, as various authors define remote work differently and there are several types of remote work whose meaning may be different, making it difficult to gather and analyze information.
2. Remote work is characterized by three main criteria: place outside the employer's premises where the work is conducted from; use of information technologies to perform work and use of communication technologies to communicate with employee, colleagues, clients and so forth.
3. Remote work intensity is positively related with increased levels of perceived productivity, but the increase in productivity is not considerable, that coincides with the study carried out by Nyaanga, where a lesser impact on productivity was found.
4. Remote work intensity is not related to job satisfaction, does not affect the organizational commitment, sense of autonomy, or quality of relationships with co-workers or supervisor, however results in Nyaanga's study led to contrary findings.
5. Negative relationship was found to exist between remote work intensity and work-life balance. Increased remote work intensity led to lower levels of perceived work-life balance. In turn, decreased work-life balance resulted in lower levels of job satisfaction and organizational commitment, which coincides with the results of the study carried out by Nyaanga.
6. Sense of the autonomy is positively related to job satisfaction, productivity and organizational commitment, however study carried out by Nyaanga did not find relationship between sense of autonomy and productivity.
7. Relationship quality between employees and supervisors is positively related to higher levels of job satisfaction and organizational commitment, which coincides with the results obtained in Nyaanga's study.

8. Relationship quality between employees and co-workers is positively related to higher levels of job satisfaction, productivity and organizational commitment, however study carried out by Nyaanga did not find link between employee-to-co-worker relationship quality and productivity.

Proposals and Recommendations

1. ICT sector organizations by addressing the problem of qualified IT specialist shortage, should offer their employees the opportunity to work remotely as additional workplace amenity, providing the flexibility to adapt to employee needs.
2. ICT sector organizations offering their employees possibility to work remotely should assess the employee's work specifics and suitability for the work to be performed remotely, taking into account the extent of the cooperation required with other colleagues and to what extent is work is conducted individually, recognizing that employee productivity is affected not only by the individual performance but also by cooperation with colleagues.
3. ICT sector organizations should consider the relationship quality between remotely working employees and other colleagues, ensuring increase in remotely working employees' productivity, job satisfaction and organizational commitment.
4. ICT sector organizations have to take into account the relationship quality remotely working staff and their managers by building relationships based on mutually positive cooperation, considering that improved relationships with managers improve employee job satisfaction and organizational commitment.
5. Considering the relatively small increase in employee-perceived productivity when working remotely, ICT sector organizations should take into account other factors that could offset or reduce those gains - such as additional time spent for written communication, information flow reduction, etc.
6. ICT sector organizations implementing remote work policies should allow their employees to individually choose the remote work intensity, allowing the employees to choose the optimal balance between being present on the organization premises and working remotely, this way lessening the negative impacts of the remote work intensity affecting work-life balance, that in turn would result in lower job satisfaction and organizational commitment.
7. Considering the importance of control over means used to perform the work for employees performing intellectual work, managers in the ICT sector organizations should offer employees greater flexibility in the way they fulfill their duties and reach objectives, this way increasing sense of the autonomy of employees, resulting in an increase in perceived productivity, organizational commitment and job satisfaction.

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THE ROLE OF BEHAVIORAL PRICING AS A KEY COMPONENT OF BUSINESS STRATEGY IN GERMAN HOSPITALITY INDUSTRY

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Abstract. In a more and more dynamic, clearer, copy-happier and more global competitive sphere, a well organised and aim oriented pricing management represents a success strategy which can decide on continuity and or even survival. Pricing as one of the main four aspects in the marketing mix must be redefined and exploited more professional, even in service related industries. A more global and intensive competition leads to an interchangeability of products and services. In this environment, pricing and especially behavioral pricing is moving in the focus of market orientated corporate management policies. Due to the habituation to the internet, the convenient use of search engines and the communication between customers via rating platforms, a more price-related orientation is forced rapidly and represents a decisive success-factor.

In general, the term "pricing actions" is used as a collective name for a wide variety of various measurements with differently distinctive price-political provisions and effects. In daily operational and tactical business, pricing actions mainly concentrate on limited sales promotions and diminished retail prices. Beside the description of such push-marketing measurements, this investigation rather concentrates on neuro-pricing strategies or better behavioral pricing strategies to produce added values for both, customers and sellers.

This research discusses the importance of behavioral pricing as a key component of business strategy in general and analyses to which extend behavioral pricing strategies can be identified in German hospitality. Initially, the paper delivers a literature overview, reviews a thematic processing and introduces the main theories. Secondly, several determinants, tools and key instruments of behavioural pricing are introduced. Thirdly and with a focussed view on the research objects, a conceptual demarcation and classification of behavioral pricing methods and effects is performed. This investigation results in a model and a basic set up for a successful implementation of a behavioural pricing strategy.

Key words: Behavioural pricing, hospitality industry, pricing strategy, Germany, pricing-effects.

JEL code: M31, L80, L83

Introduction

This article focusses the relevance of behavioral pricing (pricing-psychology) as an important addition as well to neo-classical pricing theories as to operational practices and tries to settle some examples in the context of German Hospitality Industry.

The research field of behavioral pricing deals generally with the question, how customers absorb and process rates or pricing information. It also examines, what reactions are taken on price quotes and how that information is used for decision preparing and decision making. The behavioral pricing research undertakes a descriptive approach first and focuses on the cognitive processes that are not addressed by the classical theory of price. It can therefore be seen as a complementary perspective to the classical theory of price (Maxwell S., 1995).

The forecast and creation of customer reactions on different prices was originally based on microeconomics. Already in 1890, Alfred Marshall formulated a theory of economic actions by households or customers, which is reflected in the well-known concept of the demand curve - the function of the demand quantity as a function of the price. This theory of the homo oeconomicus assumes an entirely rational acting customer, whose willingness to pay is equivalent to the additional use of goods, in practice translated into the benefits of monetary units while purchasing the product (Marshall A., 1895). The benefits of a product depend on the individual preferences of each consumer, while the price of the good is perceived by all customers objectively in identical height (Ott A. E., 1979). If two customers perceive the value of a product in an identical way, the reaction on the same price will be the same. Vice versa we will find a different purchase behavior at an identical price only because the different perception of benefits.

According to the micro-economic base theory, the requested amount for goods decreases linear monotonic with increasing price. Even if phenomena that are contrary to this theorem or limiting this point of view are already identified from the outset, they were only declared to be exceptions (like Giffen-Goods or status symbols) in the textbooks without further explanations (Jung H. J., 2006; Steinmann H., Schreyögg G., 2005).

Significant impetus for the establishment of behavioral pricing research came from psychophysics, quantitative research focusing on the effects between physical stimuli and psychological reactions. For the behavioral pricing research, Weber's law became most relevant (Leek M. R., 2001).

This requires that the measurability of the difference of two various levels of stimulus-intensity is proportional to the absolute level of these irritations. Consequently, to make the reaction measurable, the difference of stimulus must be greater the higher the base stimulus level (Chang M. H., Chiou W. B., 2007). Transferring Weber's law to the price perception of the customer, it is found that at a high price level the same absolute price difference is perceived by customers less than at a low-price level. In this context, for the first time the concept of price thresholds in the behavioral pricing Theory was introduced. The transfer of knowledge from Psychophysics to price-related investigations was carried out in the early works of Monroe (Monroe K. B., 1971; 1973).

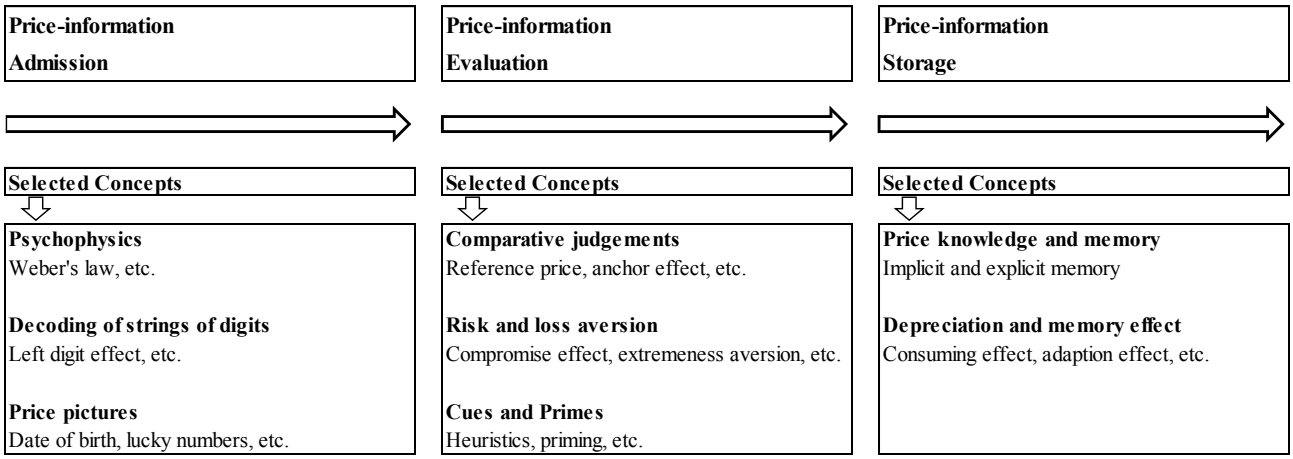
Individual behavior relevant phenomena were scientifically investigated in a series of works. This research can be referred to as precursors of systematic behavioral pricing research. These are the concept of the "reference price", the "acceptable price range" and the knowledge about the "relationship between perceived quality and price". The first systematic empirical studies in this area took place in the work of Gabor and Granger. In methodological terms, it involves observations and simple questionnaire surveys in non-controlled environments. An overview of the "preliminary phase" of behavioral pricing research is found in Monroe (Monroe K. B., 1971; Homburg C., Koschate N., 2005).

The integrative context of behavioral pricing.

To give a better orientation and systematization about the development of behavioral pricing theories, it seems to be appropriate to use the psychologic paradigm of the cognitive method of information processing. This concept assumes, that external stimuli rather influence behavior indirectly than directly. In the first step attractions must be perceived and evaluated before they might result in decision processes or different (purchase-) behavior (Jacoby J., Olson J., 1976). Accordingly, the principles of cognitive information processing deal with processes in terms of remembering, deciding, thinking, perceiving and finally the structure of our memory. Following this concept, one can differentiate three phases: admission of price-information, evaluation of price-information and storage of price-information. (Homburg C., Koschate N., 2005) Along this process chain, different concepts can be identified, which are influencing the costumer´s psychologic converting of price-information. See table 1.

Table 1

Integrative frame of references



Source: author's construction based on Kopetzky, M., 2016.

Psychophysics is one of the oldest research fields and focusses on the correlation between external stimulations and individual, subjective perception (Hagendorf H., 2011). Weber's law - as well as the Weber-Fechner law belong to the classical laws of psychophysics, a part of the experimental psychology of perception. The central fact of Weber's law is that the perception of differences between two stimuli depends on the initial stimulus. The greater the intensity of the output stimulus, the stimulus change or stimulus difference must be higher, to be noticed. In the context of pricing strategies this means the following: the customers perception of a price reduction from a 6 Euro expensive bottle of wine by 2 euro equals the perception of a reduction by 4 Euro of a 12 Euro bottle of wine. The Weber-Fechner law, however, adopts a transformation of the objective intensity of stimulus in subjective sensation strengths. The absolute difference in price must rise with rising prices. Therefore, price changes and price differences are perceived relative and not absolute (Simon H., Fassnacht M., 2016).

Price thresholds are suspected between broken (truncation) and round prices. Round prices are given, when the very last or the last digits of the price round up to zero. Fractional prices end accordingly with other digits. E.g. it is believed that the price assessment due to an increase of a price with an 9 extension to a round price with a 0 extension changes the perception of the customer disproportionately high. Stiving and Winer distinguish between level and image effects. Level effects explain how price endings with a 9 can lead to an underestimation of rates. The level effects assume that a purchaser completes prices with 9 endings, that they read rates from left to right (left digit effect) and have a limited capacity for information processing. This, for example, causes that only the first left-hand numbers are remembered. (Stiving M., Winer R. S., 1997). Image effects can be recognized, however, when customers associate a special meaning with the last digit. This price-image effects (9 price endings as a signal for a discount) and quality image effects (9 price endings as a signal for an inferior quality) can be distinguished. While the effects of the level and the price-image effect justify a higher sales volume by 9 price endings, the quality-image effect should adversely impact on price perceptions or even the sales quantity.

Customers recognize in a very individual way in single digits or in combinations of numbers within a price, price pictures or also so-called price figures. These can have subjective meanings and affect the emotional perception consciously or unconsciously. Depending on the cultural background, some numbers can have a meaning as a lucky or unlucky number. Similar reaction can be seen with customers, recognizing in the price their own date of birth, the date of

birth of their children or the date of other meaningful events. Of cause, this effect can appear in a negative way too (Couter K. S., Grewal D., 2014).

Although each customer is free to use an endless number of sources of price information, behavioral pricing researchers determine again and again, that many purchase decisions are made rather emotional than rational. It is not surprising, therefore, that it is difficult for customers to evaluate prices according to their absolute level. Therefore, customers use their own - not always current or objective – experience. Reference prices can be divided into external and internal reference prices. External reference prices are developed during the purchasing process by comparing prices of comparable products or by benchmarks, offered by the seller. For example, a price out of price lists or price recommendations (given by the producer). These so-called reference prices serve as reference values. Internal reference prices are experienced and remembered prices, information given by third parties or friends, expected prices, fair prices, the average price for comparable goods or a mixture out of the before mentioned characteristics. In the context of reference prices, the anchor effect describes the customers general need to get some orientation. Sellers can use this effect to manipulate the customer by showing higher prices for comparable goods. In general, customers are judging not in an absolute way. They always look for a relation to an internal or external anchor or a reference.

Only a group identified and known as “market-marvenists” (Hebrew, Yiddish: maven means an accepted expert who tends to spread his knowledge), appear to be well equipped with information for a purchase of specific products. In general, the term is used to describe consumers who have an up-to-date information about products, places to shop best at and even different markets (Homburg C., Koschate N., 2005).

Other typical effects in the context of behavioral pricing are the "compromise effect" and the "extremeness aversion effect". These can be proved very often and are extensively researched in some industries, but not for the hospitality industry. To illustrate this, imagine a range of three articles, of which no one stands out in all essential criteria at the same time. Because customers perceive losses more negatively than comparable benefits, they intuitively want to reduce the negative characteristics of the bought products. At the same time, they want to avoid extreme positions and tend to make compromises that can be justified later towards partners, relatives, friends, etc. (Kahnemann D. Tcersky A, 1979).

“Cues” or “primes” are stimuli, which can influence the customer consciously or unconsciously. They change the perception by activating mental memories. Cognitive notions are stimulated by cues, which can be described as information signs. Consumers tend to use simplified heuristics in complex situations. Heuristics can be mental shortcuts that ease the cognitive load of deciding. Examples of this method include using a rule of thumb, an educated guess, an intuitive judgment, stereotyping, profiling, common sense, or even the Halo-effect. According to an often-quoted study by Miller, people are not able to consider more than seven criteria for decision making (Miller G. A., 1956). People try to behave generally rational, nevertheless in certain borders, which means “restricted rational”. Due to these restrictions, they tend to use heuristics as signposts to reduce complex problems to mentally more simple challenges.

Based on experiences and observations, costumers are “learning” price information and recall them in case of purchasing comparable or even the same goods. Explicit price-knowledge is a composition out of exact data, facts and figures. Implicit price-knowledge can be defined as unconscious experienced information, which enable the customer to judge about the price for a certain product. It is strongly linked to the implicit reference-price (Kopetzky, M., 2016).

The strongest perception of losing money is perceived in the moment of paying. This perception decreases in the run of time, comparable to the concept of depreciation. This relates to the idea of “mental accounting”. In the moment of payment, the costumer books the amount paid as costs. This can even cause pain. Typical examples are yearly insurance fees, advance payments for holiday trips or bigger payments in the process of buying houses or cars. The consumption-

effect means, that in the run of using the formerly bought (and paid) goods, more and more advantages are booked on the benefit-accounts and reducing the perceived price.

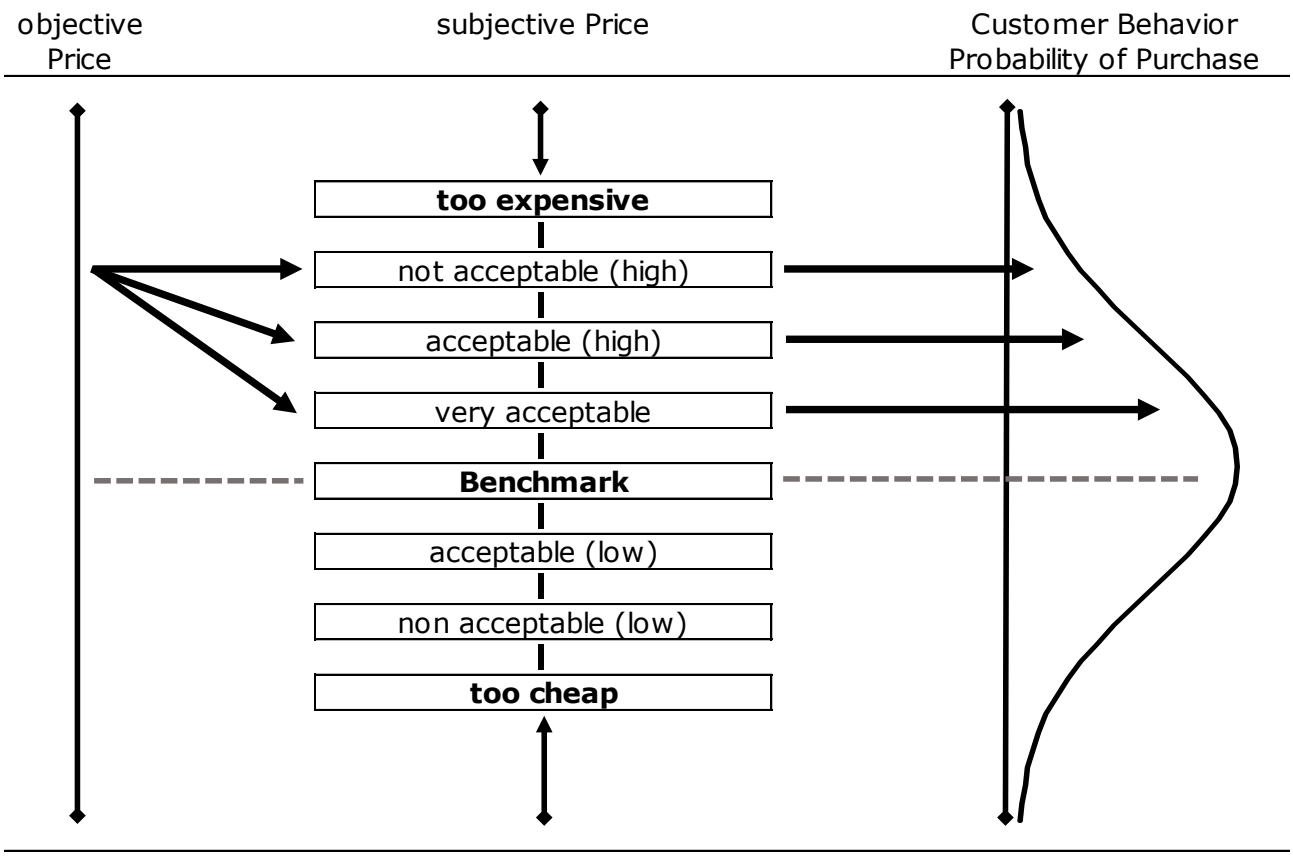
The adaption effect is based on Helsons theory of adaption-levels. He described that, in the time elapsed, customers integrate formerly done payments in their financial status quo. The perception of prices is changing in the run of time. Purchases with single payments are reducing price-perception by trend. Purchases with repeating payments keep the payment necessity alive, an effect which is called memory-effect (Helson H., 1964).

Behavioral pricing in German hospitality industry

The selective use of behavioral pricing instruments to influence the customers decision in means of making a subjective price perception of an objective price to become more acceptable is called "framing" (Kopetzky, M., 2016). One of the main research questions is, weather a strategic use of behavioral pricing methods can be identified among different operating German hospitality units like hotels and restaurants. Further researches will have to continue to picture which determinants and key instruments can be recommended and modelled for operational use in hospitality industry and (thirdly) how can behavioral pricing effects can be measured in daily practice (ceteris paribus challenge).

Table 2

Framing



Source: author's construction based on Kopetzky, M., 2016.

Even an excellent product is only profitable if it can be sold with the right price. The price is the most crucial factor of economic success as well as the use of resources. From the perspective of classical economics, price formation is setting a price for a product, which is generated regarding a recoverable sales volume to receive the greatest possible

profit. Keeping in mind a price based on the downward sloping demand curve, it is assumed that the amount of demand drops, the higher the price and increases if the price is lowered. At the same time, the contribution margin (price minus variable cost) with the price. In this context, it is to find the optimal price, where the profit margin is greatest (Michel, S. / Zellweger, C., 2014).

The permanent deployment of the performance result in some peculiarities in the cost structure of services. In comparison to industrial products, service industry deals with a high proportion of fixed costs and a relatively low proportion of variable costs. Especially high personnel costs to ensure permanently motivation and readyness. The pricing can support the capacity management and by such promoting a uniformly good usage (Bruhn, M., Meffert, H., 2012). Services is a high degree of customization through integration of the external factor (uno-actu principle).

Some determinants that influence the price result from typical service-specific features and their implications for the pricing process. These include the cost structure and their height, the competitive situation, the willingness of customers to pay and sometimes even state regulations which restrict freedom in determining prices. The pricing is so geared to the parameters demand, competition and costs. Depending on the company's situation, different priorities are set (Bruhn, M., Meffert, H., 2012). The demand-oriented aspect is of importance regarding the described meaning of capacity management in the hospitality industry. The assessment of the willingness to pay of different customer groups is critical to optimally distribute the available capacities. Approaches of behavioral pricing can be used for the analysis of willingness to pay. Behavioral economics no longer assume that a price increase also inevitably brings a decline in demand with it and argue with the limited capacity for recording and processing of information. The consumer feels satisfactory solutions often as effective enough, even if they are not optimal (Simon H., Fassnacht M., 2016).

Achieving an optimal utilization with optimum absorption of the willingness to pay with a unit price is hardly possible in liberal economic environment. Therefore, different prices must be offered by means of price differentiation for diverse market segments, corresponding to the respective willingness to pay. Target is to define the right customers, to provide the right service at the right price at the right time at the right place. The services for the professional application of price differentiations (in hospitality industry called: revenue management) must be subject to greater fluctuations in demand and the requested goods must be price-elastic. The price differentiation itself can refer e. g. to the dimensions of time, place, space, quantity and purchaser (Goerlich B., Spalteholz B., 2014).

Hospitality pricing activities in the context of Grand Départ 2017

In the context of the Grand Départ 2017 (start of the Tour de France) in Düsseldorf, restaurateurs and hoteliers were questioned, whether and to what extent they use this occasion for price - or product-political measures and whether they generally adjust their prices during periods of strong demand. The main research is based on an online survey of selected restaurants located on the route of the Grand Départ or in surrounding areas. The participants answered Questions about previous measures of price control as well as previous price and product policies, to make more attractive offers and optimize sales. In particular, price and product policy adjustments during times of tough demand or major (sports) events and the concrete plans for the Grand Départ 2017.

The online survey was sent out with the tool Google forms via e-mail and Facebook to 160 restaurateurs and hoteliers from different business-types. Overall, 32 responses out of Düsseldorf could be evaluated.

The results of this survey, carried out for the first time, can be summarized as follows: it is evident that there is a positive trend adjustment readiness of products and prices to the Grand Départ in comparison to previous adjustments at other events. 40% of the surveyed companies adjusted offers. The focus of these measures was mainly the customization

of products and services. Only restaurants with attached rooms areas (hotels), increases their prices openly. There were generally more adaptation activities in this type of operation.

Regarding the expectations for the Grand Départ, it can be stated, that these were significantly more positive at the hotel restaurants as with the other types of operation. While nearly all respondents expected positive impact on the image of the city Düsseldorf, the expectations of positive influences on their own targets, such as sales, awareness, new customer acquisition, etc. were more restrained. The assessment of the hotel restaurants was most optimistic concerning these expectations. Positive impact on willingness to pay were expected by hardly any company. Increasing adaptation willingness to major events in the product and pricing policy correlates with an expected higher paying willingness. The more variable and flexible the business, the more adjustments and special offers were planned. Different companies planned adjustments when adjustments have already been made at various times of strong demand in the past.

Based on the research question, one can formulate, that the interest of hospitality to adjust product and pricing policy is increasing in the context of major events. Because of some missing knowledge of available instruments out of the range of behavioral pricing tools and effects, potentials regarding the price differentiation are not fully exploited.

Conclusion and outlook

Starting from a financial point of view, a strategic use of the behavioral pricing tool set will enable higher profit-margins, revenues and occupancies. Hence the needs for a much more professional view and knowledge is obvious. Especially the process of checking which tools are appropriate must be developed generally and individually.

The next step in this research context will be to conduct a field study about what tools and effects are used by certain hospitality market participants and to compare the results with other industries. Secondly, another survey among hospitality professionals will be conducted to learn more about the conscious know how about using behavioral pricing patterns and the willingness of both, learning more about them and the willingness of using them. Thirdly, a model will be developed to check and to optimize the use of behavioral pricing tools and effects to increase profit margins.

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LANDFILL-BASED INDUSTRIAL SYMBIOSIS AS A TOOL FOR REGIONAL DEVELOPMENT ENHACEMENT

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Abstract. In the context of circular economy industrial symbiosis is gaining its popularity as a basis for resource efficiency by saving raw materials and waste prevention. Key concept of industrial symbiosis is to ensure that one industry's waste becomes another industries raw material. It is considered that it can generate the highest environmental, social and economic benefits as well as business opportunities, but at the same time the highest business risks followed by utility sharing and planning and management are to be addressed. Latvia is currently entering the stage of transition towards circular economy. When speaking of circular economy, it has to be stated that it appeared in the literature through recycling, recovery and reuse and is most commonly associated with waste management. The aim of the research is to analyse Latvian municipal waste landfills as starting points for industrial symbiosis, thus fostering regional economic development. The research is based on quantitative and qualitative methods, including data analysis (primary and secondary data), systems dynamics and mathematical modelling. Main results and findings of the study are development of landfill's resource equations, which can be applied to any landfill in order to identify most valuable internal resources that can be offered for industrial symbiosis Theoretical and practical implications of the research are in development of a methodologically justified. The authors develop a set of modules, which can be attracted for industrial symbiosis. Main conclusions of the research are that implementation of industrial symbiosis on a landfill basis allows company to undertake risk diversification, consequently decreasing their current direct dependence from landfilled waste volume.

Key words: *circular economy, regional development, waste management,*

JEL code: M10, R11, R58

Introduction

Lately Europe has started a very ambitious and at the same time environmentally conscious path towards zero waste concept, using circular economy policy. It has been sharply discussed since already 1980s whether a zero waste concept (Willson D.C., 2011; Zaman, A.U., 2014; Zotos *et. al*. 2009) is possible within current social and economic preconditions, still, authors suggest that a step forward circular economy or such concepts as industrial symbiosis is a good alternative – humans cannot prevent all the waste generated, but can minimize volumes going to the landfills and change their attitude towards waste.

Waste management may be divided into three stages: Preliminary stage – from inhabitant to waste collection, which is most profitable, as it contains cleanest reusable materials; Secondary stage – sorting waste on unsorted waste sorting facilities and Tertiary stage – waste from waste landfilling process. All three stages require different approaches. 3R approach (Hotta, Y., 2014; Sakai, *et.al.* 2011; Wilson, D.C., 2010) is more applicable to preliminary stage, thus within this research industrial symbiosis is applicable to tertiary stage which is the focus of the research. The authors have used systems dynamics offered causal-loop diagrams to understand the processes within different types of intermunicipal waste management companies. According to Blumberga *et. al.* (2011) the main idea in systems thinking is that a phenomenon being studied may be characterised as a whole (the system) as well as by its components (sub-systems) and that the

subsystems are related to each other and to their (super) system in such a way that a system can be said to constitute something more than an assembly of subsystems. Moreover within systems dynamics systems can be composed of both material and non-material components, which allow examining one problem from various aspects simultaneously. Landfill is a more complex unit of infrastructure then just a fly-tipping to dispose of waste in a sanitary and sustainable manner. It has a range of requirements set in the Council Directive 1999/31/EC on the landfill of waste.

Improving waste management makes better use of resources and can open up new markets and jobs, as well as encourage less dependence on imports of raw materials and lower impacts on the environment (European Commission, 2011). If waste is to become a resource to be fed back into the economy as a raw material, then much higher priority needs to be given to re-use and recycling.

Research Results and Discussion

The ambitious goals set by European Union in terms of a binding landfill target to reduce landfill to maximum of 10% of all waste by 2030, promotion of economic instruments to discourage landfilling and development of concrete measures to promote re-use and stimulate industrial symbiosis – turning one industry's by-product into another industry's raw material, means that the long-term investments into landfill infrastructure, including bank loans are to be revised as the waste amount going to the landfills is to start its decrease. The concept of the circular economy reflects the recognition that European systems of production and consumption need to be fundamentally transformed to achieve the EU's 2050 vision of 'living well within the limits of our planet' (European Environment Agency, 2016; Government-wide Programme for a Circular Economy, 2016). The inter-municipal waste management companies, whose main activity is landfilling, will be the most affected. In order to sustain the economics of the landfills only main two main options exist – either increase of disposed waste or increase of the disposal fee per ton of waste. First option is totally impossible within the preconditions set and the second option may result in dramatic increase of fly-tipping. This is the moment when the authors advise to consider third proposal to be implemented into life. Stimulating industrial symbiosis would not only allow the landfills to enter the circular economy but also to maintain their financial situation.

Current landfill management scheme foresees that the landfill operation company has an option to sort out all the valuable fractions: 1) sorted waste from the inhabitant, which comes to the sorting station on the landfill; 2) sorting the mixed household waste. Besides, a landfill can generate for its internal use or for sale to the industry following resources: heat and electricity from landfill gas, technical water from leachate, technical compost from mixed household waste, etc.

Systemic and transformative change is what is required. It is reflected in the growing number of case studies analysing innovative solutions based on new systemic thinking like “cradle to cradle” (McDonough, W., Braungart, M., 2002) and “industrial symbiosis” (Gibbs, D., 2008). Industrial symbiosis - The core of industrial symbiosis is a shared utilisation of resources and by-products among industrial actors on a commercial basis through inter-firm recycling linkages. In industrial symbiosis traditionally separated industries engage in an exchange of materials and energy through shared facilities (OECD, 2012).

The resources available within a landfill, based on their physical qualities and application are distinguished into 4 categories: a) materials; b) energy; c) services; d) skills.

Table 1

Classification of resources

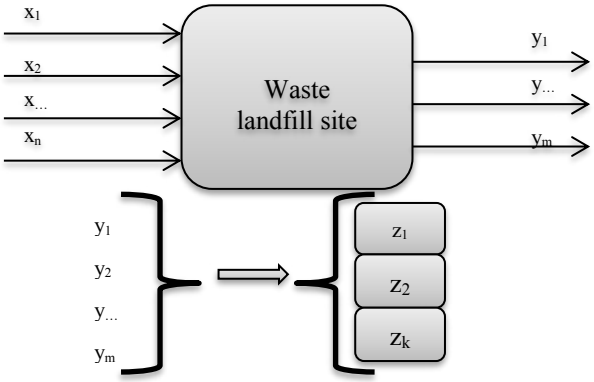
Resource	Type
Electricity	Energy
Heat	Energy
Leachate	Materials
Technical compost	Materials
Secondary resources	Materials
Sludge	Materials
Internal infrastructure	Services
Technical equipment (vehicles)	Services

Source: by authors

"Services" and "skills" stand for support resources for example - transportation, available storage space, etc. which are not used in full by the company and can be shared.

Within this research the authors have developed a model depicting material and energy flows within a landfill, presented by figure 1, where:

- x_1, x_2, $x_{...}$, x_n – are the input data, i.e. waste flows that enter waste landfill site (which includes sorting station and waste pre-treatment centre),
- y_1, $y_{...}$, y_m – are the output resources that are left so far without appropriate application within a landfill site,
- z_1, z_2, z_k – industries which may take advantage of y resources and save the consumption of primary resources.



Source: by authors

Fig.1. **Energy flows within a Landfill**

It is obvious that in the nearest future landfill sites will have constant decrease of volumes of the disposed waste. A landfill is a long-term investment and an object of infrastructure that cannot be easily suspended. This is explained by the fact that even stop of waste disposal does not affect the chemical processes already undergoing in the waste disposal cell. Although, the authors consider that landfills in Latvia will stay as significant elements of infrastructure for the upcoming years, and taking into account current tendencies, it is important to transform these facilities, in order to ensure their sustainability and feasibility into technological parks (Cudecka, N., 2011; Cudecka-Purina, N., 2011). These technological parks could also include waste recycling facilities for a particular waste stream (i.e. rubber, metal, textiles, etc.), especially focusing on rare waste streams, so the particular recycling facility could accumulate particular waste stream from the whole country, or even, including from closer neighbouring countries, in order to increase its efficiency.

The developed model will allow landfill management company increasing effective management of the resources that are being developed during its daily operations as well as to move towards circular economy and have an impact on waste minimization. Such development is also significant in context of regional development, as household waste landfills are situated in regions, normally in more or less distanced areas from the inhabitants. Although with currently available financing from EU funds and Norway grants, it is possible to implement the goals set within Regional development guidelines 2013-2019 (Cabinet of Ministers, 2013). Where one of the goals is increase of local and administrative role in promotion of entrepreneurship and improvement of business environment in the municipalities.

1. Latvian Landfill Management Companies

Latvian waste management system was not designed using "one fits all" approach, but it allowed municipalities to choose their desired management and operation, a landfill management company would undertake. All 11 household waste landfills are municipality owned – each region has an intermunicipal waste management company, operating a landfill. It has to be stressed that waste management regions in Latvia vary both by financial possibilities and number of inhabitants. For example there are regions with less than 90 000 inhabitants. As a result of a previous research the authors have proved that the regions with number of inhabitants below 120 000 are economically ineffective and one of the possible solutions could be their transformation into technological parks (Broitman, *et.al.* 2012; Cudecka, N., 2011; European Environmental Agency, 2009).

Regarding other waste management activities, here the regions start to vary. The authors have analysed all the operations, undertaken by the landfill management companies and developed following distinctions:

- full cycle landfill management companies;
- landfill management companies engaged only landfilling & education activities;
- landfill management companies engaged in landfilling, sorted waste collection and education activities.

For comprehension, "full cycle" includes following activities: education of the inhabitants; waste container park (including for sorted waste); contracts with private and legal customers; household waste collection; bulky waste collection; C&D waste collection; green waste collection; hazardous waste collection; sorted waste collection; waste sorting at sorting stations with further sale of secondary resources; waste transportation (if necessary, using reload stations); management of all infrastructure elements; waste pre-treatment; landfilling (collecting biogas and production of electricity and heat). Using systems dynamics approach, it is possible to examine and evaluate the operations performed by each type of the companies in terms of beneficial and/ or negative impacts.

The most notable difference in the operation of different types of inter-municipality companies is – influence on "landfilled waste", as the companies which have only waste landfilling as their main operation, due to decrease of number of inhabitants and different economic growth from the forecasted in the beginning of the system development, have limited financial resources for development and are interested in landfilling more waste then preventing it from landfill. On the other hand, the companies doing full cycle benefit from sales of secondary materials and can invest that profit into development of the infrastructure.

LMC doing full cycle so far look as having most logical and not interfering elements. On the contrary it is quite obvious that type of landfill management companies engaged only landfilling & education activities have most contradictory situation. These landfill management companies are mostly interested in disposing maximum volumes of waste as it is their only profit generating activity.

2. Options for Industrial Symbiosis

Circular economy is seen as a new business model expected to lead to a more sustainable development and a harmonious society (Geng Y., Doberstein, B., 2008; Europesworld, 2014; Lett, L.,A., 2014).

Currently main source of income for any landfill is the landfill fee – paid by waste management companies, bringing waste for disposal, basing on de facto weight of each waste collection truck. According to regional waste management plans, it has been foreseen that in order to maintain and upgrade the infrastructure, cover the loans and other expenditures and as the disposed waste volumes were predicted to be decreasing, the waste disposal fee was forecasted with a systematic increase.

Within the model, proposed by the authors, industrial symbiosis can be implemented by attracting other industries or by diversification intermunicipal waste management company's activities. Overall, successful implementation of industrial symbiosis will allow the LMC's to become sustainable and economically viable, and the decrease of disposed waste volume from over 80% today to 10% in 2030 will become more realistic to achieve. In addition this will have a direct impact on the society – as the LMC will be able to avoid rapid increase of disposal fee, the fee for waste collection from the inhabitants will not be influenced from this component in the volume it was planned previously.

When analysing landfill's by-products from its daily operations and resources that are currently underestimated, facilities that can be evaluated for establishing industrial symbiosis are presented in Table 2.

Table 2

Industrial symbiosis options

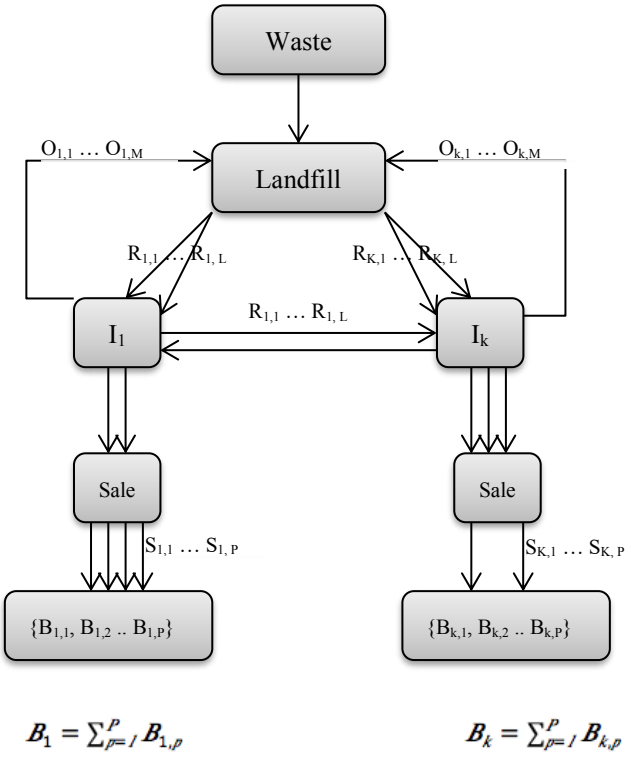
Module	NACE	Type of activity	Required resources	Required construction time
A	A1 - Crop and animal production, hunting and related service activities A3 - Fishing and aquaculture	Farming – pig farms, fish and bird farms, mushroom growrooms	landfill's offered infrastructure, heat, electricity	1 month to 2 years, depending on farm complexity
B	C16 - Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	Timber factories	landfill's offered infrastructure, heat, electricity, technical water.	1 day to 6 months, depending on facility complexity
C	A1 - Crop and animal production, hunting and related service activities	Greenhouses	landfill's offered infrastructure, heat, electricity, CO_2.	1 month to 1 year, depending on facility complexity
D	A1 - Crop and animal production, hunting and related service activities	Agriculture – greening works	Technical compost, technical water.	1 month to 3 years, depending on facility complexity
E	E39 - Remediation activities and other waste management services	Sewage sludge	landfill's offered infrastructure, electricity.	2-3 years
F	D35 - Electricity, gas, steam and air conditioning supply	Solar panels, windmill generators	landfill's offered infrastructure, connection to the grid	approx. 2 years
G	I55 - Accommodation, R93 - Sports activities and amusement and recreation activities	Recreation area with educational centre	landfill's offered infrastructure, remediated area, electricity, heat.	From 1 month to 2 years

H	R93 - Sports activities and amusement and recreation activities	Swimming pool	landfill's offered infrastructure, remediated area, electricity, heat.	1-2 years
I	E38 - Waste collection, treatment and disposal activities; materials recovery	Waste sorting factory	landfill's offered infrastructure, electricity, heat.	1-3 years

Source: by authors

In order to gather the data provided in table 2, the authors assessed different industries and identified types of activities, or better to say facilities, which would require resources that can be provided by landfill as the primary input resources into the facilities. This table provides an insight into possible efficient use of landfills resources. It is clearly seen, that there is a variety of options available for a landfill management company to either engage into industrial symbiosis by itself or attract other industries, by offering them cost savings on primary resources.

The Figure below illustrates the primary waste and resource flow. Waste is being generated and collected, afterwards separately collected waste is being sorted and all the secondary resources are being sent back to the industry, the rest waste flow enters landfill, where it is being processed in the pre-treatment facility and the waste designated for disposal is being landfilled.



Source: by authors

Fig. 1. **Flow of the resources within industrial symbiosis**

Landfill daily operations generate a range of Resources (R_1^1, …, R_L^K), which, within the model, developed by the authors, are being offered to different modules (in case, Landfill decides to construct modules offered in table 2) or industries, in case Landfill decides to attract third party to use the resources available (I_1, …, I_K). The Figure shows the interconnections and flows of the resources when applying industrial symbiosis. Landfill offers resources (R_1^i, … R_L^i) to the industries (I_1, …, I_K), industries can also share the resources among themselves. During production processes the Industries also have waste ($O_{„1}$ …, $O_{1,M}$; …; $O_{K,1}$, …, $O_{K,M}$), which is being sent to the Landfill. Output of industry

activities, i.e. Product is being sold to the market and the figure illustrates the sales volume ($S_{1,1}$, …, $S_{1,P}$; …; $S_{K,1}$, …, $S_{K,P}$) and profit from sales is being generated ($B_{1,1}$, …, $B_{1,P}$; …; $B_{K,1}$, …, $B_{K,P}$).

Four balance functions are presented, that will allow landfill management companies to evaluate resources that can be used for industrial symbiosis and, depending on their volume, will be able to develop a decision making tree for optimal development strategy.

1. Waste balance

$$Q = \sum_{i=1}^{K} Q_i = Q_{rw} + Q_{fi} + Q_{sl} \qquad (1)$$
$$Q \leq R$$

where:
rw – return waste
fi – for industries
sl – second level

$$Q_{rw} + Q_{fi} + Q_{sl} \leq R \qquad (2)$$

2. Electric balance

$$\sum_{j=1}^{K} E_{1,j}^{first} + \sum_{i=1}^{T} E_{2,i}^{second} \leq E \qquad (3)$$

3. Thermal balance

$$\sum_{j=1}^{K} TE_{1,j}^{first} + \sum_{i=1}^{T} TE_{2,i}^{second} \leq B \qquad (4)$$

4. Technical water balance

$$\sum_{j=1}^{K} W_{1,j}^{first} + \sum_{i=1}^{T} W_{2,i}^{second} \leq W \qquad (5)$$

It has to be evaluated that different types of the resources have different life-cycle. For example, electricity and heat generation from methane has approximate active lifespan of 30 years and further 10-15 years will be generating minimum level of resources. This means that a landfill management company has to take into account the status quo of the landfill and evaluate strategies for long-term, mid-term and short-term development. On the other hand this decrease of the resources may be compensated by generation of wind power station on the recultivated part of the landfill, which will be high enough and without high trees, to ensure efficient operation of the generator. All these current resources, their life-cycle and substitution possibilities have to be taken into account when choosing optimal industries/modules. Landfill management companies have also to consider possibility of variable structure, depending on seasonal market requirements.

3. $$B = \sum_{i=1}^{K} B_i^{first} + \sum_{i=1}^{T} B_j^{second} \qquad (6)$$

where S stands for "Sales" and C – for "Costs"

$$B - C = \Delta B \qquad (7)$$

ΔB is the source of financing that will be devoted to development and provision of financial stability.
The resource flow assessment presented above is one of the first steps to be undertaken by landfill management companies. The upcoming transition to circular economy will require high initial costs, but it is already proven that these costs are paying-off in the long-term.

Further the authors propose a range of activities that need to be promoted by the municipalities.
In particular, these activities should include:

- a range of seminars with the entrepreneurs of particular region in order to:
  - discuss the issues of raw material consumption;
  - to identify material flows of the companies;
  - to identify the output material and waste flows;
  - to map the material and waste flows;
  - to identify the potential industrial connections, i.e. industrial symbiosis cooperation options.
- a clear and comprehensive regional support programme for establishment of industrial symbiosis, especially on the basis of household waste landfills;
- a range of educational seminars regarding role of entrepreneurship in the circular economy, costs, obstacles and future benefits of this transition;
- a roadmap for establishment of circular economy on the regional basis.

It has to be stressed, that these activities need to be coordinated and stimulated from the state level, in order to ensure their consequent, logical and most optimal development and implementation. It is foreseen that until 2018 a state circular economy working document can be developed. The authors suggest the above-mentioned activities, alongside with clearly set responsibilities to be included in this document, in order to ensure that the circular economy transition is ensured evenly across the country.

Conclusions, Proposals, Recommendations

After undertaking an extensive and broad research on the topic of the thesis, the authors have come up with following summarisation of the results.

1. Waste management is a complex field, involving society, economy and environment. Environment and entrepreneurship are in a constant conflict situation, which means that a constant seeking for compromise in order to ensure fulfilment of environmental requirements alongside with provision of company competitiveness and sustainable development is essential.
2. One of the factors, laying as a basis of present research, is significant concern of inevitable resource scarcity. With current economic development and constant increase of population it is vital to identify priority resources, necessary for securement of sustainable development. In this respect shifting to circular economy would allow keeping current resources for longest possible period within economic cycle.
3. Implementation of industrial symbiosis on a landfill basis allows company to undertake risk diversification, consequently decreasing it's current direct dependence from landfilled waste volume.
4. Implementation of the developed model allows landfill management companies, as expensive infrastructure elements, to ensure sustainable development and retain increase of waste disposal rates.
5. Within this research the authors have developed industrial symbiosis model, which is aimed on effective use of landfill's available resources. With development of technological parks, regional development would encourage improvement of infrastructure and development of new jobs, which altogether will have a positive effect on improvement of country's economic ratios.

The authors have also developed following recommendations:

1. Landfill management companies have to develop current resource balance, in order to identify, which of the resources possess most potential and which would be best possible application in order to secure its effective management.
2. Landfill management companies may implement industrial symbiosis in a step by step approach, implementing one module after another, or starting cooperation with a new industry.
3. In order to implement circular economy on a state and regional level, policy makers together with industry representatives have to carry out a resource flow assessment, in order to identify maximum number of industries/facilities, with a potential to implicate in such type of symbiosis.

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NEW CHALLENGES OF INNOVATIVE LEADERSHIP IN A DIGITAL TECHNOLOGIES ERA

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Abstract. It is widely believed that the use of creative and innovative thinking helps leadership to support the management process in a modern business oriented organization. Today, the management of organizations is mainly based on the widespread use of modern information technologies. In these circumstances organizations broader and broader are using the digital methods and approaches in their management systems. Therefore a leadership style is gradually changing to the innovative thinking management which crucially distinguished with traditional management skills. Previous research shows that there is a clear link between an interactive, charismatic, transformational leadership and innovation. Such kind of leadership focuses on the big picture and allows one to introduce new ideas and challenging energy to the organization. The purpose of leadership exists and its enormous value will become evident in the next few years when new information technologies take effect on business globally. That sets the topicality of the chosen research direction. The present article accounts for the research conducted to investigate new challenges of innovative leadership relating to management system development on the basis of information technologies. The methodological approach of research was based on the literature review, the interviews of 182 respondents (mainly top managers of companies) and statistics (statistic data analysis, mathematic statistics). The main finding was that there is a close correlation between innovative management and IT based management systems in organizations, and that this affects management performance of companies. Finally, the authors emphasize the potential for further research on this topic.

Key words: *information technologies, innovative management, leadership*

JEL code: O31

Introduction

The recent economic developments in business environment have greatly increased the influence of digital methods in the management style. Thus the traditional management style has changed considerably. As a result of the change many organizations have come to the conclusion that the previously successful management models do not ensure development of organizations, therefore there is an objective necessity to introduce an IT-system based management. There are several reasons for implementation of the new management system which meets the needs of the specific organization and environment, and it is based on innovative technologies:

1) The intensity of change is increasing.
2) The share of intellectual and innovative staff is increasing.
3) Digital management techniques are increasingly used in day-to-day management.
4) Customers' expectations for innovative and unique products are growing, and others.

The intensity of management changes in organizations is steadily rising, and the reason for it is the rapid globalization of information, fast development of social networks and other modern communication means, the emergence of innovative solutions in today's working environment, for example, skype meetings, twitter, various data bases and others.

Along with globalization of information the number of globally available products and services and innovative solutions increase. The clients have the opportunity to take active part in the creation of innovative solutions and the result

is the change in the external and internal environment of the organization. Acceptance and implementation of these new changes in the organization's everyday life is the capability of the company managers to become the real innovation leaders, and it requires new and innovative solutions in the organization management itself.

The objective of the study, the results of which have been revealed in this article is to understand the impact and amount of the innovative challenges created by the impact of information technology on the modern style of management in Latvian enterprises.

The following tasks were set for reaching the objective:

1. To determine the effect of the general application of digital technologies on the innovative management style in organizations,
2. To analyse and evaluate various forms of influence of information technologies on the internal and external environment of organizations.

The study used the following methods:

1. Comparative analysis of literature review.
2. Results of the questioning and interviewing of medium and top level managers. The authors consider that the Interviews give insights into peculiarities and problems that the leaders encounter managing the business and the work of the employees under the rapid development of information technology. The expert interviews were performed in the first quarter of 2017. All of them were conducted in the presence or by phone introducing the questions that were later sent electronically. A total of 182 experts were interviewed, of which 102 actually participated and responded in the survey.

The object of the study – innovative management style.

In the study, the authors analyse the new challenges of innovative leadership style that is caused by the management of an information technology based company.

The article outline:

1. List of literature,
2. Methodology,
3. Validity and reliability of the achieved results,
4. Summary, main findings, conclusions and suggestions.

The study uses special literature, publications and the authors' collected survey data on the impact of information technologies on innovative management styles in organizations.

Research Results and Discussion

The Significance of The Impact of Digital Technologies on The Style of Innovative Leadership In The Modern Market Competition.

The term "innovative management" takes an increasingly important role in the management processes of various companies and organizations. The companies shall be innovative in order to be able to survive in the current competitive markets. The competition created by globalization does not withstand those companies whose management does not understand the importance of being innovative. Therefore it is important that the leader of the organization as the central management body shall realize the significant impact of innovations on the development of the company. Leadership and management is a process, where an individual influences a group of individuals to achieve a common goal [4]. The term "innovative leadership" or innovation-oriented management style involves in itself many aspects of company management and development. An innovative leader, regardless of the fact, whether he represents the highest, middle or lower level management, specifically leads the organization to an innovative goal [5]. In big international organizations usually the company's board chairman fulfils the role of the innovative leader, and he leads the organization to the

achievement of the strategic long-term goals. In turn, the leader of a small company would usually realize most of the top management functions.

Following the study of *Euroconsult*, where a group of 400 leaders were interviewed, 52 of them recognized autonomy, discretion and responsibility, as an innovation-enhancing factor, staff recruitment and motivation (48), financial support (48), management support (36), creation of small project-oriented teams (27), a successful set of competencies (27), successful management of innovation process (27), good customer relationship (21) [1]. This is in favour of companies with an innovative leadership style, creativity, knowledge support and innovative approach to information that constitutes a strong economic growth boost, favouring development in today's global world.

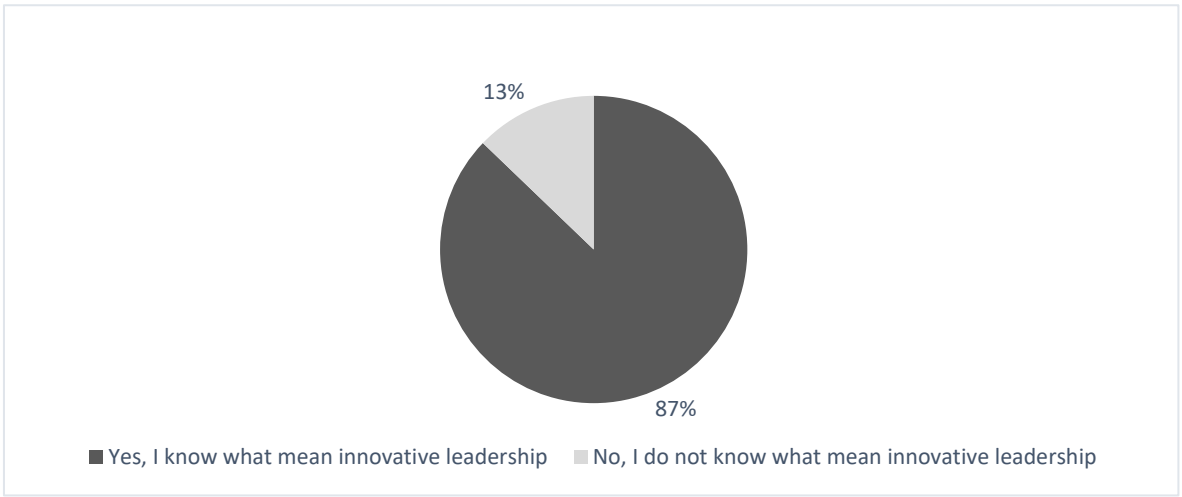
Innovative management is the key to the future of the organization. People who work for the company always have innovative ideas and suggestions for improving products. These proposals shall receive innovative status and be implemented in real life and services, but there must be an organized company's internal environment so that these proposals could receive innovative status and be implemented in real life.

By definition, innovative projects are projects that contain elements of originality, novelty and enhancement, and are important for the competitiveness of the product [1].

In addition to the leadership of the company, the managers control the exact execution of tasks that may be slightly adjusted due to changes in the external market conditions. However, there is a tendency to maintain a constant internal environment for as long as possible so that everybody might feel as comfortable as possible. Without a leader, the company is not able to follow new and up-to-date market trends [3].

An Analysis of The Opinions Expressed In The Respondents' Interviews.

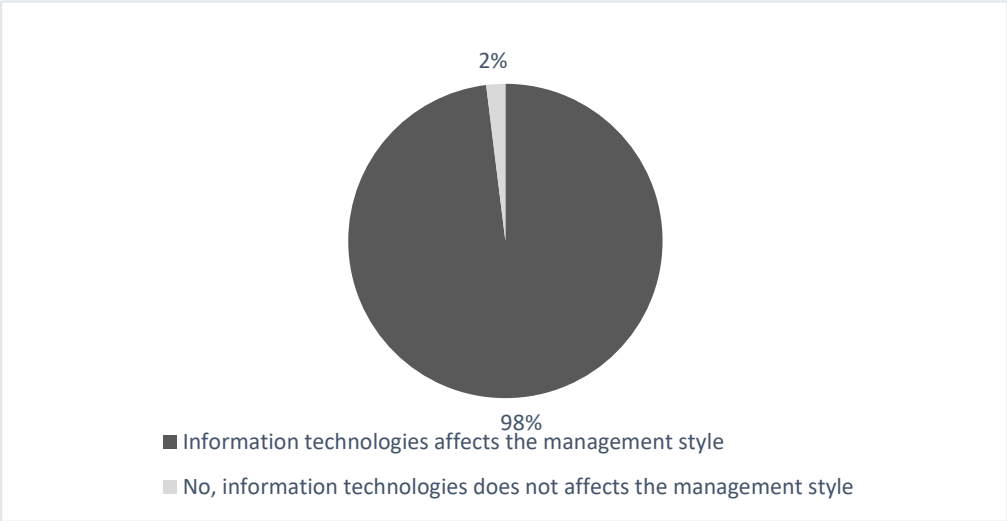
The purpose of the interviews – to find out professional managers' understanding of innovative leadership styles. 182 persons were interviewed and they were asked the same 16 questions about the impact of information technology on the management style of an innovative leader. The respondents were selected by the principle:-middle and top managers. The authors of the article reviewed 7 most essential questions out of the 16 questions that were asked in the survey. The first question was asked to find out the opinion of respondents what in general an innovative style of management meant. 87% of the respondents answered that they knew the meaning of the innovative management style. However one can conclude that 13% of the interviewed leaders were not convinced of what was an innovative management style (Figure 1).



Source: based on author's research

Figure 1. **% of respondents who know that is an innovative management style**

There is a much more uniformed opinion when the questions concern the assessment of whether information technology development affects the style of innovative leadership. According to the results of the respondents' survey, it can be concluded that 98% of the medium and top managers mention that the innovative management style is directly affected by the information technology development, 2% note the absence of this influence (Figure 2). An innovative and strong leader has got one of the main roles when focusing on the goal and managing innovation in various business processes. Innovations, as the commercialization of creativity, give the main impetus to achieve the business goals and excellence in competitiveness [2].



Source: based on author's research

Figure 2. **The impact of info technology development on the innovative management style**

In order to find out how personnel management processes integrate contemporary modern technologies, the authors' survey detected that the majority of the respondents (87%) were convinced that personnel management was increasingly involved in information technology (Figure 3).

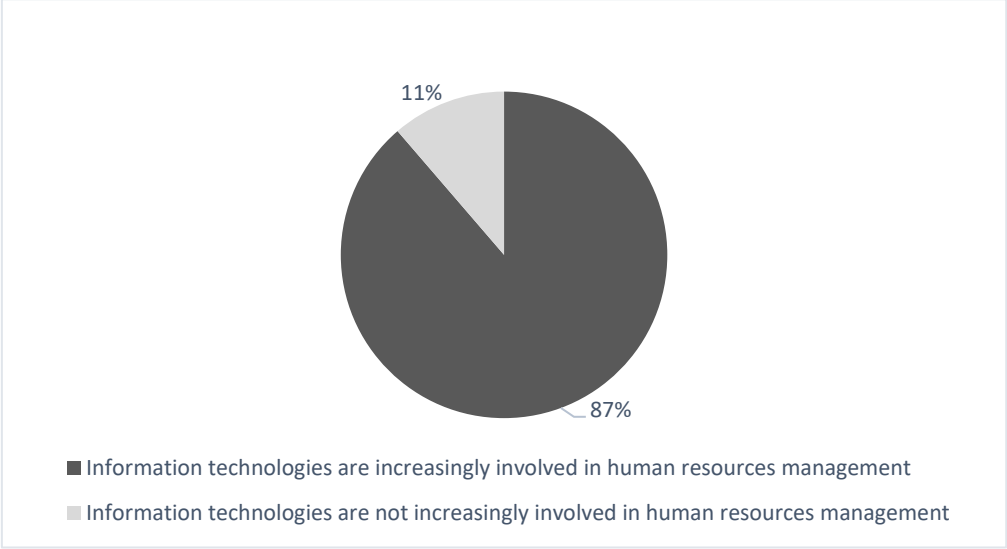


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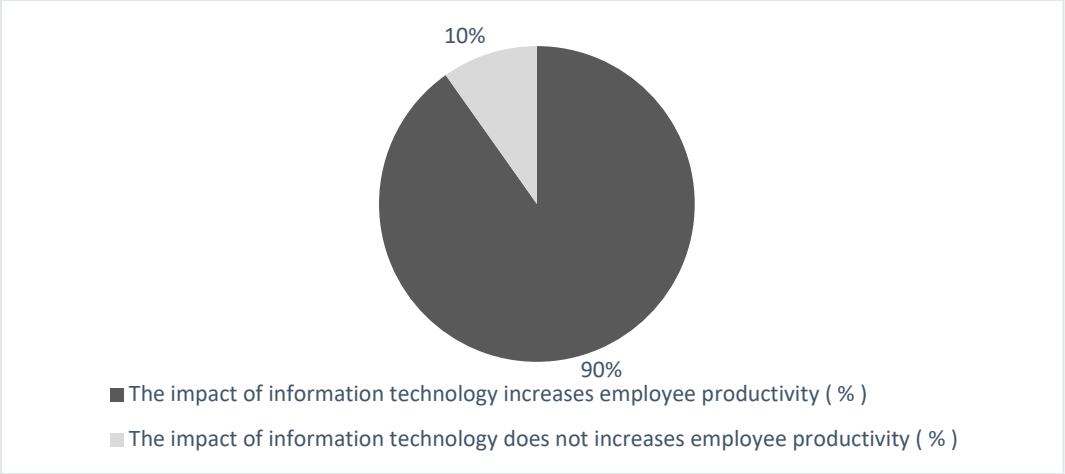
Figure 3. **Personnel management is increasingly involved in information technology**

It can be deduced from the information obtained that interactive surveys, social networking and digital marketing opportunities for recruiting and surveying are increasingly important in the selection of staff. Personnel selection professionals must have common goals and vision with the organization's future plans. Personnel selection is the task of forecasting the future development of a company, where with the help of different programs and surveys one can judge the potential employee's growth abilities and suitability. Education and experience are not decisive for the new employee to be accepted into the team.

The next question in the survey -: "Employee productivity is increasing as a result of information technology". The majority of the responders– 90% answered positively. A considerably smaller number of responders answered that the employee productivity was not affected by information technology (Figure 4).



Source: based on author's research

Figure 4. **Employee productivity is increasing as a result of information technology**

The next question that the responders had to answer was about the fact whether the introduction of innovations in the company was related to the development of information technology.

The majority of the responders– 79% affirmed that the productivity of information technology was on the rise. Part of responders – 21% were convinced that the productivity of employees did not grow under the influence of information technology (Figure 5).

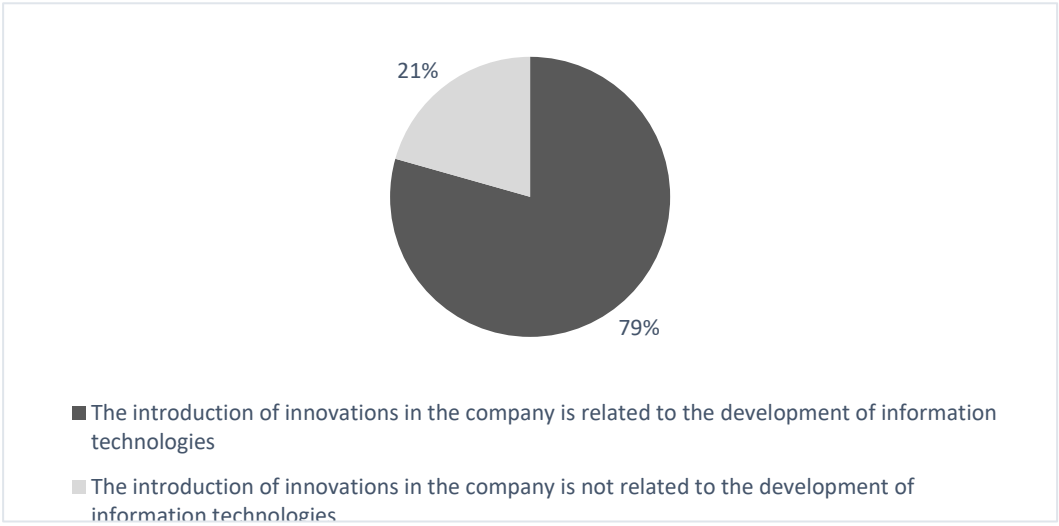


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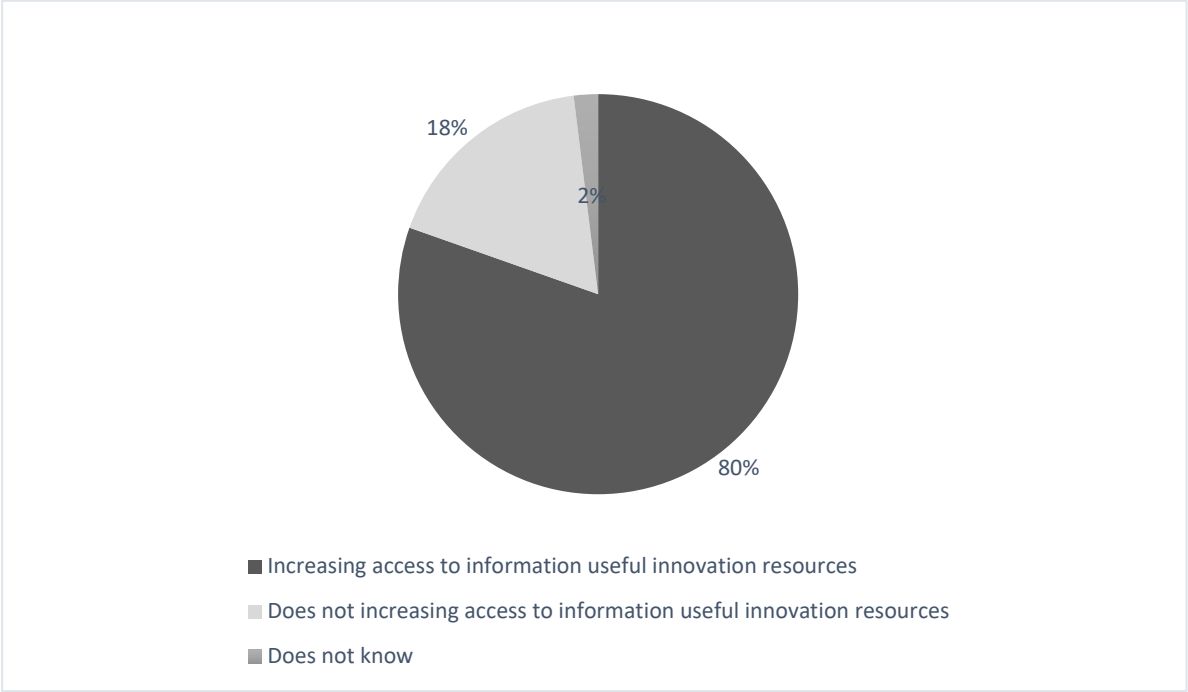
Figure 5. **The introduction of innovations in the company is related to the development of information technologies**

Many of the new available informational technologies are affected by the rapid breakthrough experiencing several useful opportunities for businesses. Virtual reality, case internet, cloud computing, 3D print and other technologies are among them. It is positive that these new technological possibilities improve, increase security and activates the introduction of various innovations in enterprises.



Source: based on author's research

Figure 6. **Increasing access to information useful innovation resources**

In the authors' survey, respondents were asked to answer the question whether the availability of information for useful innovation resources was increasing. 80% of all responders assured that the availability of such information for innovation resources was increasing, 18% - that it was not increasing and 2% or 2 responders could not answer to the question clearly (Figure 6).

Conclusion

From the results of the survey the authors concluded that very fast development of information technologies Imposes an obligation on the leaders of the organizations to change the management style substantially – switch to the so-called "innovative management style". However, at the same time, the results of the study confirm that only approximately 15% of the company leaders, managers have got a proper notion of it. It influences the development of enterprises and increases their competitiveness.

Proposals

1. The company owners should increase the essential requirements to the top level managers for their IT knowledge.
2. Management personnel of state, municipal and private sector organizations should considerably increase the knowledge about IT capabilities in management processes.
3. To include a course in management study program "Innovative management" in the higher education institutions.
4. Organizations shall take care on the proper provision of the programs for implementation of innovative management.

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UNDERSTANDING THE ESSENCE OF ALTERNATIVE FINANCE: THEORETICAL ASPECTS

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Abstract. While playing a key role in the economic system, financial markets are subject to constant development. In recent conditions of global economic crisis accompanied by historically low GDP growth and challenges in potential growth, financial market counterparties were placed in rather unfavourable conditions of profound risks, expanding regulatory requirements and turbid profit perspectives. Such conditions became a greenhouse for innovations accelerating the emergence of various alternative finance opportunities, which were believed to solve or at least mitigate the pressure of the topical problems of access to finance and overall lack of investments.

The research aim of this paper is to suggest a fundamental understanding of what the term alternative finance represents by developing a systematisation of alternative finance providers which could be taken as a basis for further research in this area. To reach the set goal, a number of top publications by leading experts and professional organisations will be acknowledged, highlighting the organisational criteria and main characteristics of alternative channels for raising both funding or credit resources. Through the work, the author will use the monographic method, the method of economic analysis and the method of graphic visualisation.

Developing a consensus view on what the term alternative finance constitutes could have an important role in further academic research as well as provide a certain support to the on-going development of alternative finance regulation by providing a decent input in the practical sense. The results of the presented work state that despite the belief that the alternative investment market is poorly understood, the research done up to now allows us to move to the next step and promote the development of a detailed market structure classification and analysis.

Key words: *alternative financing, financial markets, market development.*

JEL code: O17, O16, G2

Introduction

While playing a crucial role in the formation of a solid financial system, financial institutions are believed to be fragile entities, which due to their salient systemic interlinkage might acknowledge the financial stability and liquidity of their partners and competitors much more than it is generally believed. For instance Claessens and Kose suggest that since operating with highly leveraged balance sheet banking and other similar forms of finance intermediation can be precarious undertakings, especially knowing the roles financial institutions play in maturity transformation and creation of liquidity. Fragility makes coordination, or lack thereof, a major challenge in financial markets. (Claessens S., Kose M.A., 2013). These fragilities have been broadly recognised, suggesting markets, institutions and policy makers to develop various coping mechanisms (Dewatripont, Tirole, 1994). Developed financial markets, when function properly, allow the transfer of resources from savers to investors, and contribute to making the economy more robust to shocks by enabling risks to be allocated appropriately (Chami R., et al 2009). On the global level, financial markets ask for a supervisory and regulatory support - these mechanisms are needed in order to support financial markets and supervise risks caused by the activity of stakeholders. Still there is no right way to ensure stability - when poorly designed or weakly implemented regulation as well as safety measures can increase the likelihood as well as the severity of potential financial crises

(Claessens S., Kose M.A., 2013). It is believed that even the support provided by the public sector, which often is seen as a potential rescuer, can also have distortionary effects (Barth et all, 2006).

The conviction that developed financial markets, which in current view include alternative financing as well, bring positive effects on overall economic growth can be traced through the literature studies up to Schumpeter (1911), who admitted a vibrant financial sector as critical to capital allocation and economic growth. On the other hand less optimistic understanding can be found, especially if the financial growth of the past 20 years is analysed – Greenwood and Scharfstein (2013) in their work dedicated to *the growth of finance* presented a comprehensive literature analysis highlighting a diversity of opinions stating that the period of recent growth has come with a puzzling increase in the cost of financial intermediation, questioning the real economic benefit (Philippon, 2012). Regardless of the diversity of opinions presented in the literature there is one common moment highlighting the recent development of financial markets –alternative or non-bank financial markets the emergence of which brought an entirely new type of uncertainty for both financial market participants and regulatory bodies. Alternative financing possibilities, unlike many derivatives seen in the markets which are often used in speculative needs, were announced to meet the demand of real sector – supporting the access to finance by enterprises, suggesting the realisation of projects with added economic, innovative and social value. Fair to note, that the use of alternative financial instruments significantly gained in popularity and, depending on country specifics, in certain cases managed to become a visible market player.

In spite of gaining recognition among both – potential users of alternative finance channels as well as alternative finance providers and regulators, the terms alternative finance still lacks certain clarity and systematisation. On the one hand, since this form of financing hits new highs every year systematisation and classification might be seen as something unnecessary or burdensome. On the other hand, unclarity, complexity and lack of transparency are the reasons why traditional financial markets including funds, strictly regulated banking sector, and complex derivative instruments decoupled the real economy from the financial sector. It can be argued that the absence of systemised approach and lack of regulation are reasons why alternative financing possibilities became so popular; nonetheless, the lack of union understanding of alternative finance providers and alternative finance or non-bank institutions leaves space for misinterpretation, supporting misleading choice and therefore might trigger fraud and poor risk management. Other important aspects are interconnectedness and interdependence of financial markets which play an important role in risk mitigation and prevention of risk transmission and systemic shock. The open question is if and to what extent alternative finance can influence the smooth operation of traditional finance markets, which in certain case rely on heavy support from the public sector, for instance during bailout procedures and through deposit guarantee schemes. The aim of this research is to develop existing classification of alternative financing possibilities by supporting the discussion of existing alternative or non-bank financial sector terminology. The study will try to complement a fundamental understanding of what the terms alternative finance and alternative financing represent. This will be done by suggesting a union chart summarising the known alternative financing possibilities – financing opportunities such as crowdfunding or business angels the financial activity of which has often been referred to as potential financing source of European Small and middle enterprises (SMEs). The core research question is a classification of the alternative finance market. Through the work, the monographic method, the method of economic analysis and the method of graphical visualisation will be used.

Financial markets are defined as markets for the sale and purchase of stocks (shares), bonds, bills of exchange, commodities, futures and options, foreign currency, etc., which work as exchanges for capital and credit bringing together and supporting the development of diverse participants starting from individuals and up to various financial institutions where banks probably are the most well-known (Business Dictionary, 2016). It is the intention that, while supplementing the rapidly growing literature on alternative finance, this paper will contribute to the development of the classification of alternative finance. The remainder of the paper is organized as follows. Section 1 will discuss the existing terminology

and its drawbacks as well as face common interpretation of alternative finance market and possibilities. Second section will suggest additional classification of alternative finance providers welcoming the research question of the paper and suggesting future development of union understanding of alternative or non-bank financing possibilities. Finally, the main findings of the paper and suggestions of possible studies will be highlighted.

1. Alternative, shadow banking and non-bank finance – appropriateness of terminology

Certain stagnation in traditional banking, natural development of financial markets supported by technological innovations can be seen as the main factors supporting the emergence of alternative finance in the broad meaning of the term. Alternative financial market representing non-traditional financial institutions, comparably new and therefore alternative groups of investors as well as new financial products developed as an alternative to the traditional ones. These changes raise a number of questions including the union definition and regulation, possible supervision mechanism and their interlineate with traditional financial markets. Fair to note, an important characteristic of the alternative financial market era is a new generation of potential users – keen buyers of high tech and ardent consumers of luxury goods. For traditional banking, which, in light of the financial crisis and regulatory tightening became increasingly risk averse, entrepreneurs with little or no decent collateral or those chasing a dream of excessive profitability trigger more concern than willingness to cooperate. At the same time, traditionally available risk-oriented instruments such as collateralized debt obligations and a vast number of derivatives in most of the cases stand out of reach of the investment activity that the average citizen can develop. As it was merrily discussed in The European Alternative Finance Benchmarking Report, conducted by Cambridge University back in 2015, since the global financial crisis, alternative finance – which in scope of the report includes financial instruments and distributive channels that emerge outside of the traditional financial system – has thrived in the US, the UK and continental Europe. In order to reach the set goal of the paper and develop a systematisation of alternative finance providers first thing to do is to acknowledge official definitions and existing literature readings. When speaking about alternative finance, the definition seems to become the first challenge. In order to reach the set goal of the paper, the 1st sub-part will focus on the analysis of existing terminology providing a brief summary and existing classification mainly discussing non-bank related finance. In the traditional banking system, intermediation between savers and borrowers occurs in a single entity. Savers entrust their funds to banks in the form of deposits, which banks use to fund loans to borrowers. Savers furthermore own the equity and long term debt issuance of the banks. In case of shadow banking financial organisation is different. Moreover, an open question of key difference separating shadow banking and non-banking financial is still rather vague.

At the 2011 Summit meeting in Cannes, the G20 address the shadow banking system as the financial system that extends credit but is outside the regular banking sector (FSB, 2013). Financial Stability Board back in 2011 explained the "shadow banking system" as credit intermediation involving entities and activities outside the regular banking system. Literature suggests the shadow banking system to be a web of specialized financial institutions that channel funding from savers to investors through a range of securitization and secured funding techniques. While shadow banks conduct credit and maturity transformation similar to traditional banks, shadow banks do so without direct and explicit public sources of liquidity and tail risk insurance (Adrian, T., Ashcraft. A.B., 2012). Shadow banks perform credit intermediation services, but typically without access to public credit and liquidity backstops. Instead, shadow banks rely on privately issued enhancements. Such enhancements are generally provided in the form of liquidity or credit put options. Like traditional banks, shadow banks perform credit, maturity and liquidity transformation (Adrian, T., Ashcraft. A.B., 2012). Referring to Greenwood and Scharfstein (2013), while greater access to credit has arguably improved the ability of households to smooth consumption, it has also made it easier for many households to overinvest in housing and consume in excess of sustainable levels. This increase in credit was facilitated by the growth of shadow banking, whereby many

different types of non-bank financial entities performed some of the essential functions of traditional banking, but in a less-stable way. The financial crisis that erupted late in 2007 and proved so costly to the economy can therefore be largely evaluated as a crisis in shadow banking. Since a comprehensive system explaining shadow banking was presented by Pozsar already 2008 in *Shadow Banking System*, this type of financial intermediary will not be further discussed.

As to the non-bank sector, the existing framework is rather irregular. The World Bank suggests the following definition: a non-bank financial institution is a financial institution that does not have a full banking license and cannot accept deposits from the public. While highlighting the main characteristics of non-banks, the World Bank admits non-bank financial institutions to facilitate alternative financial services, such as investment (both collective and individual), risk pooling, financial consulting, brokering, money transmission, and check cashing. Above all, non-bank financial institutions are seen as a source of consumer credit (along with licensed banks). Examples of non-bank financial institutions include insurance firms, venture capitalists, currency exchanges, some microloan organizations, and pawn shops. These non-bank financial institutions provide services that are not necessarily suited to banks, serve as competition to banks and specialize in sectors or groups. Interesting to note, that due to recent developments as well as the lack of a union approach, the term non-bank institutions might be evaluated from a slightly different perspective. Here, for instance, the view of the European Central Bank (ECB) could be mentioned which uses the term of non-monetary financial institutions. ECB developed the following classification dividing financial intermediaries into two main subgroups: monetary financial institutions, where ECB and national central banks as well deposit taking institutions and money market funds are grouped and non-monetary financial institutions representing non-money market investment funds, insurance corporations and pension funds (ECB, 2016). For a handier visualisation the main aspects of shadow banking, non-monetary institutions and non-bank financial institutions are summarised in a Table 1.

Table 1.

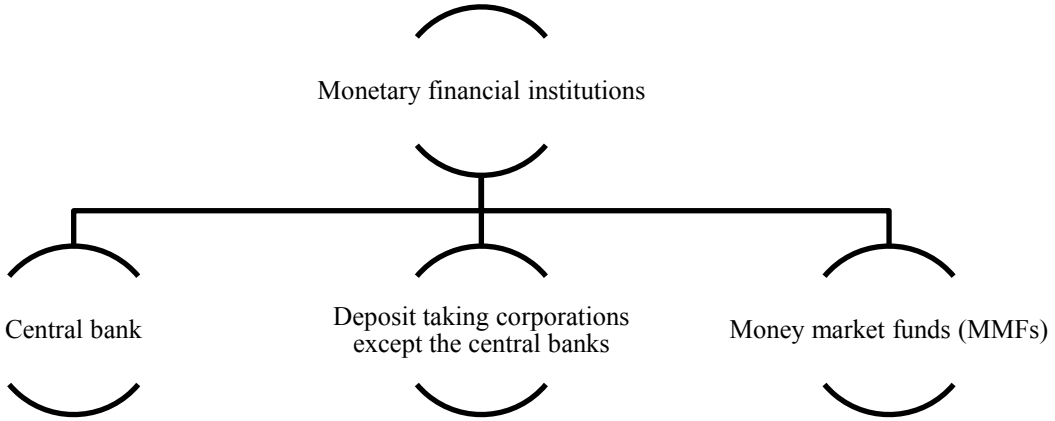
Shadow banking, non-monetary institution and non-bank financial institution comparison

	Shadow banking institutions	**Non-monetary financial institutions**	**Non-bank financial institutions**
Overall explanation	A web of specialized financial institutions; Financial system extending credit but being outside the regular banking sector.	Financial intermediaries.	A financial institution that does not have a full banking license and cannot accept deposits from the public.
Forms included	The financial institutions and segments of the financial sector including finance companies, money market funds, some hedge funds, special-purpose vehicles and other vehicles that are involved in various activities related to securitisation.	Broad measure: all financial intermediaries except banks and insurance corporations and pension fund (ICPFs). Narrow measure: includes only investment funds, money market funds (MMFs) and financial vehicle corporations (FVCs).	Non- bank financial institutions include insurance firms, venture capitalists, currency exchanges, microloan organizations, and pawn shops.

Source: author's summary based on literature overview, including the FSB, the ECB and the World Bank sources

Table 1 supports discussion of what are the criteria set for classification and what characteristics divide shadow banking institutions and non-monetary financial institutions and how ones should be treated from the legislative and supervisory point of view. Important to note that in its Report on financial structure, the ECB presents a reference to the definition used by the Financial Stability Board (FSB) suggesting parity for terms *shadow-banking* and *non-bank* financial sector. The report states that using the Financial Stability Board's definition of the non-bank financial sector, or so-called "shadow banking" sector, an initial measure has been constructed using the European System of Accounts (ESA) sector classifications of non-bank financial intermediaries (ECB, 2016). Despite the ongoing uncertainty of terminology, there are certain attempts to develop a statistical database for alterative market which will definitely support further research and analysis. Moreover, the availability of quantitative data might also put an end to the floating understanding of the topic and bring a unified qualification of alternative investment. So far, the question whether shadow banking and non-financial institution are equal terms remains. Fair to note that since professional financial terminology has proved to be concrete and precise synonyms are not be advisable.

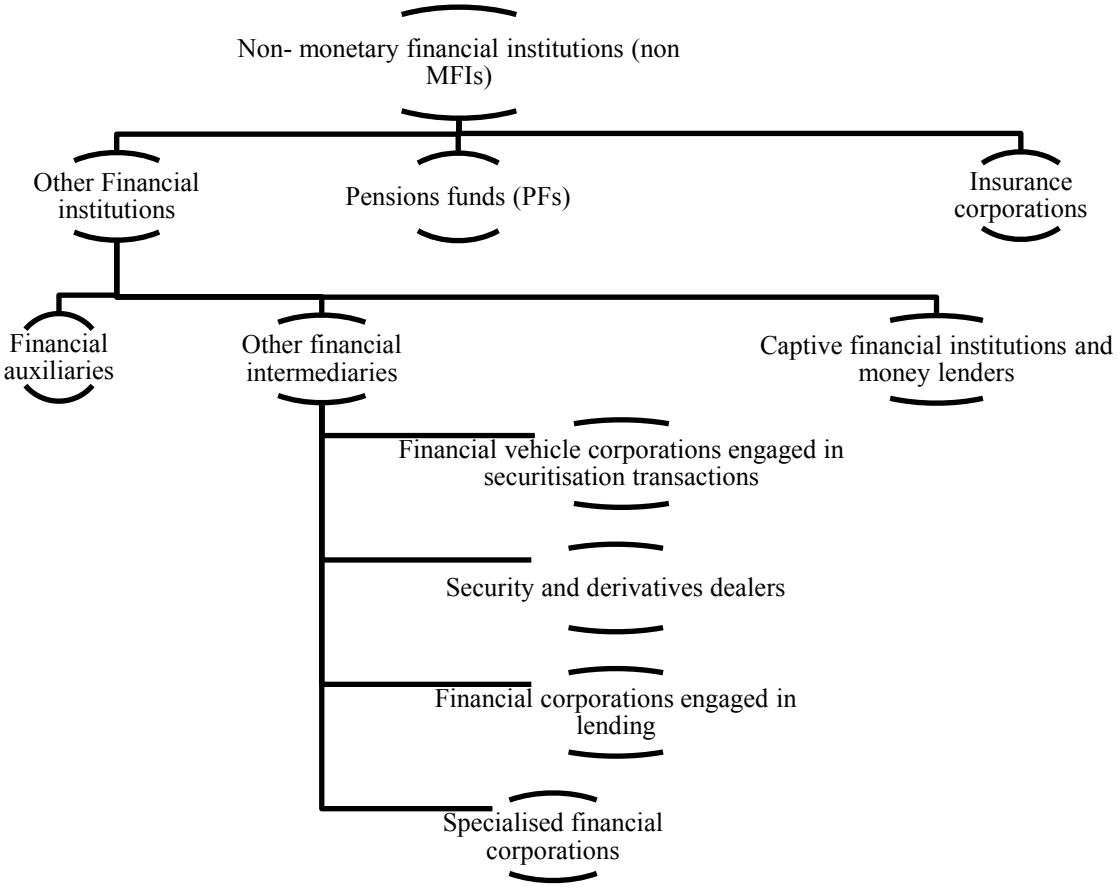
As to the monetary financial institutions, due to the developed regulative and supervisory base no question arise. Figure 1 mirrors the qualification of monetary financial institutions suggested by ECB.



Source: author's construction based on ECB Economic Bulletin, Issue 4 / 2016 – Article 1

Fig. 1. **Monetary financial institutions**

At the same time, the ECB presents a comprehensive summary of what non-monetary financial institutions are, presented in figure 2. At this point, a clear division between institutions and financing mechanism is needed. While respecting the ECB vision on non-monetary financial institutions one might ask if crowdfunding platforms for example, should not be included in the chart, and if so, then should not the system of alternative financing possibilities be visible in the chart developed by the ECB. Financial dictionary suggests financial institution to be an organization, which may be either for-profit or non-profit, that takes money from clients and places it in any of a variety of investment vehicles for the benefit of both the client and the organization, covering both, depository and non-depository institution (Financial dictionary, 2017).



Source: author's construction based on ECB Economic Bulletin, Issue 4 / 2016 – Article 1

Fig.2. **Non- monetary financial institutions**

While this comprehensive summary provides a broad system of non-monetary financial institutions one can argue that it is not complete. While studying the existing classification such alternative financing possibilities like crowdfunding, business angels or friends-fools and family 3F will not fit in any of the provided subgroups. Fair to note that these possibilities of attracting finance (and therefore the possibility of alternative investment) are at the same time well acknowledged by the European Commission, especially in terms of financing small and medium-sized enterprises. The European Commission admitted loans and guarantees, venture capital, business angels, growth stock markets, and crowdfunding to be potentially useful sources to address and ease the difficulty of small and medium-sized enterprises to access finance – companies representing over 99% of businesses in the EU and therefore crucial to support their growth and innovation (European Commission, 2017). The question of whether a vast list of alternative currencies including cryptocurrencies can be added and treated as an alternative way of financing is still open, mainly due to its highly speculative and in certain cases illegal character. Nonetheless, as long as there remain possibilities to purchase or exchange goods with cryptocurrency intermediation, there is no bold argument why this group of alternative market representatives should not be included in alternative market analysis.

Based on the implemented literature study, it can be suggested to identify three main aspects.

Alternative finance institutions – where those, not covered by a centralised supervision and regulatory requirements should be analysed. Here both shadow banking and nonbank financial institutions could be evaluated, especially since some definitions suggest a rather narrow difference between those.

Alternative investment possibilities – discussing various and less traditional investment possibilities, for instance specific funds which may or may not fall under centralised supervision;

Alternative finance resource providers which could cover institution level as well as separate investors or, large institutional scale and small and medium targeted resource providers.

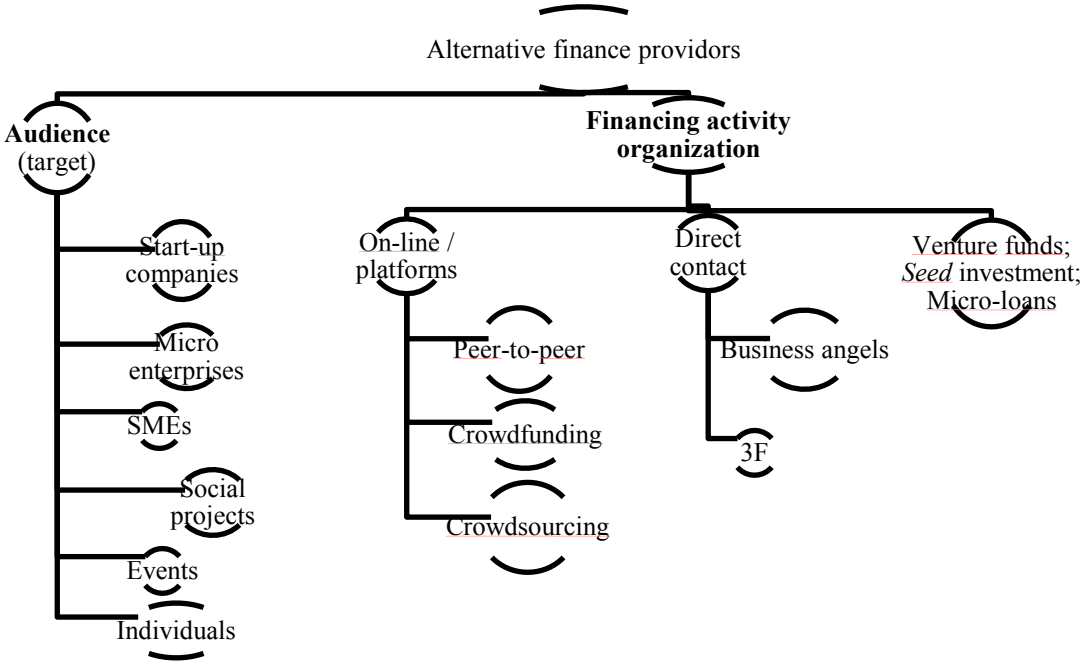
Keeping the set target of the paper, the second part of the study will suggest a systematisation of alternative finance resource providers, which are broadly admitted to be an important source of financing for entrepreneurs and small and medium-sized enterprises.

2. Organization chart of alternative finance providers: Business angels, crowdfunding and others

Among others, the European Commission in its Communication of 2011 recognised that Europe's economic success depends largely on the growth of small and medium-sized enterprises (SMEs) pointing their difficulty to access finance as the main obstacle to growth. Banks and other financial institutions were encouraged to provide clients with information about alternative financial instruments and actively support networks of mentors, advisors and business angels. Even more – back in 2011 the European Investment Bank (EIB) group had increased its Risk Capital Mandate to €5 billion and extended the scope to include co-investing with business angels (European Commission, 2011). The overall intention to raise awareness among SMEs and entrepreneurs about the possibilities of raising the needed capital via non-bank channels is reasonable. Moreover, respecting the different experience and education level of European entrepreneurs the encouragement for banks to share information about alternative financial instruments and supporting of mentors seems grounded. At the same time, the questions of how to group the alternative financing possibilities and what aspects of alternative finance providers are leading should be answered. Furthermore, the resource capacity of so-called alternative finance providers must be presented. Among those, business angels, crowdfunding and venture capital provided possibilities seem to be most acknowledged.

The Business Angel movement reached a size of 5.543 billion euros of investment in 2013, claimed to represent the biggest share of the early stage investment market in Europe – in other words, forming 73% of early stage investment – this type of alternative financing cannot be neglected (Dibrova. A, 2015). Crowdfunding, which usually refers to public online calls to contribute finance to specific projects, is also one of the emerging alternative forms of financing that connects those who can give, lend or invest money directly with those who need financing for a specific project (European Commission, 2017). Such a system that would cover this part of financial market covering both traditional, regulated sector and alternative financing possibilities seems to be absent.

To complement the development of systematisation of alternative finance market and reach the set goal of the paper, figure 3 suggests a possible structure of alternative finance possibilities which up to now have not been analysed along with the non-monetary financial institutions. While crowdfunding and business angels more represent the organisation of potential investment access or way of investment rather than an institution, in order to reach the goal of the European Commission and ease access to finance for small and middle enterprises as well as entrepreneurs, without a simple and transparent structure, they risk to remain as far from the "users" as traditional financial instruments, causing confusion more than providing support.



Source: author's construction based on previous research

Fig. 3. **Non- monetary financial institutions**

It can be suggested to complement the existing systematisation of financial markets and non-monetary institutions with a chart mirroring those alternative finance possibilities which target the root problems of attracting finance – individuals, small companies and those for whom the access to broad and regulated financial markets for some reason is not suitable. This is the very first attempt to classify the alternative financing possibilities from the perspective of market organisation and target audience – those who might be especially interested in gaining financial resources via alternative financing vehicles which, even though broadly admitted, have not developed a regulatory base and accepted interlinkage with traditional financial markets. Above all, this attempt suggests that the widely used argument that the alternative finance market is weakly understood in light of its wide popularity loses value.

Conclusions, Proposals, Recommendations

1. Despite the proven awareness of regulators regarding the alternative or non-bank financial market, a union classification system still has not been developed leaving space for misleading interpretations.
2. The variation in terminology used by the institutions covered in the analysis implies a high possibility of risk transition and therefore is not optimal for sound development of cross-border investment.
3. Clear criteria of alternative finance providers and alternative finance institutions are needed, which asks for sequent steps from a supervisory perspective.
4. A suggested option is to organise alternative finance providers depending on their activity and target audience of investors.
5. Since the development of alternative finance market and preferable instruments varies, the development of top-down supranational regulation can be advised.
6. The classification of non-monetary financial institutions should also include such alternative financing possibilities as crowdfunding, peer-to peer lending and business angel investment, as the activities of these

resource providers meets the definition of institution, therefore allowing to treat them as a subtype of financial institution.

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VEHICLE TYPE AND LICENSE PLATE LOCALISATION AND SEGMENTATION USING FCN AND LSTM

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Abstract. We propose an end-to-end vehicle type and licence plate localisation and recognition system, based on a combination of existing methods, modifications to neural network architecture and improvements in the training process, resulting in high accuracy licence plate localization and recognition with minimal post-processing.

The proposed system was trained and tested on a custom data set of 17000 manually labeled images, containing in total 19000 license plates, 18300 motorcars, 1414 trucks, 722 ambulances, 492 motorbikes, 45 trailers, 26 police motorcars, 15 firetrucks and 6 other operative cars. Additional transformations such as added noise, zoom and rotation were used to generate more images.

The methods and tools used include FCN, transfer learning, Feature Extraction Maxout CNN, Recurrent LSTM networks, Tensorflow etc.

The resulting system is capable of localizing multiple types of vehicles (including motorcycles) as well as their licence plates. The achieved precision of the localisation is 99.5%. The whole number recognition accuracy is 96.7% and character level recognition accuracy is 98.8%. An end-to-end test for a single image took 0.2 seconds on a GPU and 8 seconds on a single core CPU.

Key words: *FCM, LSTM, License plate localization, license plate segmentation,*

JEL code: C45, C60

Introduction

The existing and estimated increase of people and number of vehicles on the roads leads to increase in traffic intensity. This increase reinforces the need for automation of traffic monitoring means including automatic and accurate number plate recognition systems. If the licence plate recognition is used to detect traffic offenders, it is useful to simultaneously detect the type of the vehicle, since the traffic regulations might be different for trucks, ambulance and police vehicles. The detection of vehicle types and recognition of number plates both can be addressed noninvasively by the use of cameras and computer vision approaches, eliminating the need for other sensors.

In the last few years the field of computer vision has experienced a significant advancements thanks to combination of big data, increasing availability of computation power and deep learning methods. These advances allows one to create more accurate camera based object recognition systems than was possible only few years ago. However, in order to compare the results, existing state-of-the-art deep learning methods are usually trained and compared on a widely known and general datasets. Therefore, a successful use of deep learning on specific real-world problems, such as license plate localisation and recognition, requires additional research which is offered in current paper.

The paper first introduces the related work, and then proposes the system with these main parts:

The localisation of vehicles and license plates, which is accomplished by FCN. Fast training of localisation and classification network was achieved by the application of transfer learning.

For the recognition the localised license plate is divided into smaller regions using sliding window approach and those regions are processed by a character reader neural network consisting of customized Feature Extraction Maxout CNN and a Recurrent LSTM network.

System implementation, training and testing was done using Python language and Tensorflow framework. The base training data was acquired from real life radar cameras angled downwards. In order to acquire an even larger labeled data set to improve the robustness of supervised machine learning and resulting localisation and recognition system, a custom image augmentation system was developed for generating additional training images, adjusting the lighting, rotation, zoom levels, blurring and noise levels. An end-to-end test for a single image took 0.2 seconds on a GPU and 8 seconds on a single core CPU.

Finally the results are described, which include the capability to localize motorcycles, motorcars, trucks etc. as well as their licence plates. The achieved precision of the localisation is 99.5%, the whole number recognition accuracy is 96.7% and character level recognition accuracy is 98.8%.

Related Work

Convolutional neural networks are the basic component of state-of-the-art approaches in several computer vision tasks including object detection. This is demonstrated by the results of the annual ImageNET challenge ILSVRC (Russakovsky O. et al., 2015). For the last few years, all winning approaches in image classification and object localization categories are deep learning approaches. Example winning localization methods include OverFeat (Sermanet P. et al. 2013), very deep convolutional networks (VGG) proposed by (Simonyan K. & Zisserman A., 2014) and ResNet (He K. et al., 2016) based Faster R-CNN (Regions with Convolutional Neural Network Features) proposed in (Ren S. et al., 2015). Other state-of-the-art object detection methods include You Only Look Once (YOLO9000) by (Redmon J. & Farhadi A., 2016) and Single Shot MultiBox Detector (SSD) by (Liu W. et al., 2016).

Even before the success in the ImageNET challenges, the CNNs were researched for the use in object detection. In (Grangier D. et al., 2009) and (Farabet C. et al., 2012) a CNN was used for scene parsing of the image, also called semantic segmentation or full scene labeling. The semantic segmentation tries to determine class of each pixel in the image, and this information is more than is needed for simple localization of objects. However, this additional information may help to improve the accuracy. In our approach we used modern CNN based semantic segmentation approach described in (Shelhamer E. et al., 2017). The essential part of the paper was the use of a modification of CNN called Fully Convolutional Network (FCN). While the CNN consists of convolutional layers followed by fully connected layers, the FCN does not have the fully connected layers. Therefore, when the input of FCN is an image, the output is also an image. In the concrete example, the output image of FCN is the result of semantic segmentation.

The recognition of localized license plates proposed in this paper is mostly based on the approach in (Li H. & Shen C., 2016). We use the same main workflow with CNN and a Recurrent Neural Network (RNN). Such networks have internal memories, so their outputs are affected not only by the current inputs but also by the previous inputs. This property makes RNNs particularly suitable for use on sequential data. For example, RNNs have achieved great results on speech recognition (Hannun A. et al., 2014) and image captioning (Xu K. et al., 2015). In (Li H. & Shen C., 2016) a CNN is used to acquire sequence of features corresponding to reading license plate from left to right. In this paper we further extended the functionality of this approach, inspired by papers (He P. et al., 2016) and (Shelhamer E. et al., 2017). The specific feature acquiring CNN used in current work is a maxout CNN (Goodfellow I. J. et al., 2013). Such networks have been proved to extract useful features from texts in images in (Jaderberg M. et al., 2014). The architecture of maxout CNN from (He P. et al., 2016) had to be modified to best fit our exact problem. The specific type of RNN used for sequence

reading in (Li H. & Shen C., 2016) and in the current paper is the Long Short-Term Memory (LSTM) proposed in (Hochreiter S., & Schmidhuber J., 1997). It is known for its ability of dealing with RNN training problems - vanishing and exploding gradients.

The Proposed System

The overview of the system is shown in figure 1. The system consists of two main parts - localization and recognition. The localization of the number plates as well as localisation of few classes of vehicles is carried out by a Fully Convolutional Network. The location in the image that corresponds to the number plate is further processed by a recognition system that is based on a combination of Maxout CNN and Long Short-Term Memory networks.

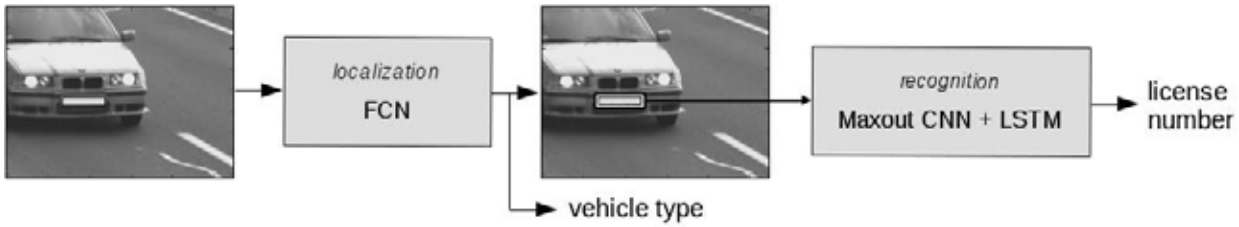

Fig. 1. **System for localisation and recognition of number plates and determination of vehicle type**

1. Localization

We trained a system that is able to localize multiple types of vehicles (including motorcycles) and license plates. The system is based on a VGG FCN-8s architecture described in (Shelhamer E. et al., 2017). The classification network VGG16 is converted to FCN by discarding the final classification layer of VGG and by converting the fully connected layers to convolutional layers. In addition, a skip connections are added in the network, so the final layer can be fused with the information from lower layers for finer segmentation detail. The architecture is shown in figure 2. The outputs from three layers are combined in order to get the segmented image, which in current example have pixels of three classes - background (white), motorcar (gray) and number plate (black).

The training dataset for localization network consisted of 17000 images, that were manually labeled for this research. Dataset consisted of 19000 license plates, 18300 motorcars, 1414 trucks, 722 ambulances, 492 motorbikes, 45 trailers, 26 police motorcars, 15 firetrucks and 6 other operative cars. The dataset was divided into two groups. In the first group we had 2500 images of size 3480×5180 with 4203 segmented license plates, 4831 motorcars, 480 trucks, 416 motorbikes, 242 ambulances, 45 trailers, 26 police motorcars, 15 firetrucks and 6 other operative cars. The second group consisted of 14902 segmented license plate numbers. We began by training the network only on the first group. In order to continue training with another set, we created an Annotator. This Annotator trains the network on the first group of images and then predicts car type segments for the second group, while preserving the human labeled license plate segments of the second group for the further training. With this technique we were able to train on both image groups together and achieve good results for both the license plate and car type segmentation. From this point we understood that we'll be able to localize license plates, trucks, ambulances and motorbikes, but were not so sure about all other classes with few training examples.

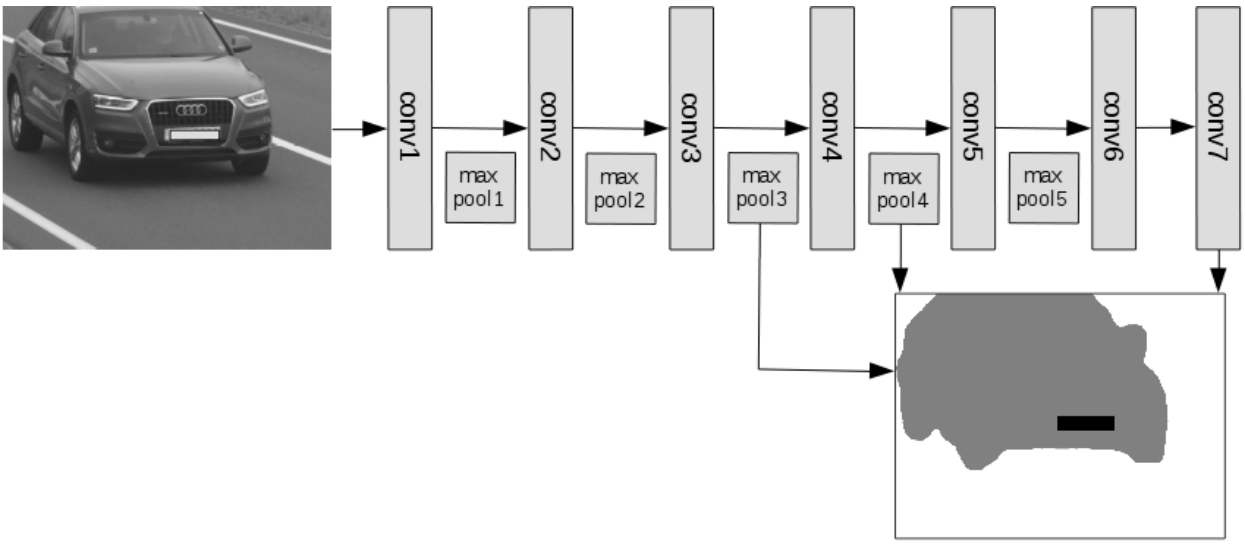

Fig. 2. **Fully Convolutional network for semantic segmentation**

Our tests showed that we are able to successfully segment motorcars, trucks, ambulances and motorcycles with high reliability. Three examples of the test dataset can be seen in figure 3. The related results in the same figure have minimal post-processing such as drawing a rectangle around license plate region based on the assumption, that the license plate is rectangular. The vehicle type segmentation may result in a connected region that consists of several subregions of different vehicle types. The type that occupies the largest area of the connected region is most likely the correct result. Therefore, the smaller regions of other vehicle type are replaced with the most confident predicted class.

The training process may take very long time for such huge network such as VGG. We use particular FCN-8s VGG configuration which have more than 134 million parameters to learn. We significantly reduced training time by using the transfer learning - we used publicly available pre-trained VGG classification model to initialize some of the weights in our FCN model. The pre-trained VGG differs from the VGG FCN-8s only in the final layers, which were converted from fully connected to convolutional. Therefore, for all those convolutional layers we did not convert, we restored weights from the pre-trained VGG.

The original VGG was not trained to detect such objects as number plates, so it had to be fine-tuned for our task. Fortunately, the first convolutional layers of CNNs are usually learning simple image features, such as edges. Those features are similar for different objects, so our model needed only to learn the weights of the new convolutional layers. To accomplish this, in the training process of VGG FCN-8s, the back-propagation is stopped after it changes the weights of new convolutional layers. So now we have modified VGG with extra layers for FCN-8s and we only need to learn the weights for the last layers which were not convolutional in VGG.

We trained our model using GTX 1080 Nvidia graphics card. Our machine has 32 GB of RAM which is not enough to store all the data and labels. To deal with this issue, we created Python generator which loads images from local directory, creates corresponding labeled masks for network and randomly augments images for robustness (described in detail below). As a result we only have to load to the RAM images and labeled masks that are needed for certain training batch. However, loading and preprocessing images takes relatively long time. Thus, while the generator is generating a batch for training, the GPU is idle. In order to deal with this inefficiency and speed up the training, we created multi process system, which loads and pre-processes images on a separate thread, then puts the results in a queue. Another thread takes the batches out of this queue in parallel. In this way we can consume CPU load as much as we need while using almost 100% of GPU resources. With this approach we only needed 8 hours to successfully fine-tune our network on a single GTX 1080 Nvidia graphics card.

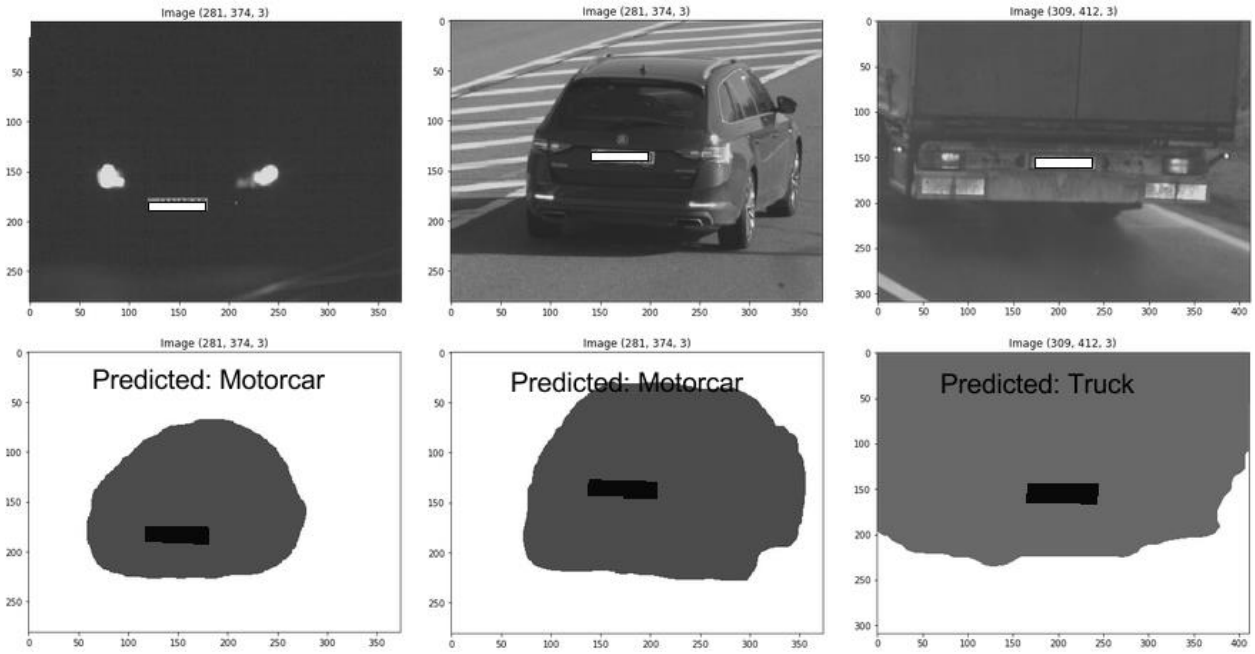

Fig. 3. **Segmentation results**

In order to increase the robustness of our network and overcome the overfitting, we also implemented image augmentation into Python generator. Using the original training examples, the python generator creates new training images on the fly. Each training batch is randomly augmented by modifying the following properties of the images:

1. Brightness to localize objects when they are very dark or very light;
2. Rotation to localize objects in various orientations;
3. Zoom to localize objects in various resolutions;
4. Blur to localize object when they are blurry;
5. Gaussian Noise to localize object when the image is noisy.

Before feeding the images to the neural network, they are resized by a factor of 0.35. The largest images in dataset are 3480px in height and 5180px in width, so after the resize those images have 1218×1813 pixels. This is still a large amount of pixels, and because of VGG models complexity and how FCN handles labeled masks, the GTX 1080 graphics card is unable to load at least 4 images at once (batch size). In order to improve the performance, we developed a method that crops regions with class labels from the full images. So the FCN is not seeing the regions without labels, but it still sees all the labeled segments represented in the dataset. This allows a training batch size of at least 4.

With the proposed approach we were able to achieve 99.5% license plate localization accuracy without almost any post-processing for better localization results. Training data was gathered from real life radar cameras with similar positions and angles towards the road. The camera position and example test results are shown in figure 4. Additional tests were carried out with cameras that were closer to the road and looked directly at vehicles (parallel to the road). The results for such setup was just as good as for the one in figure 4.

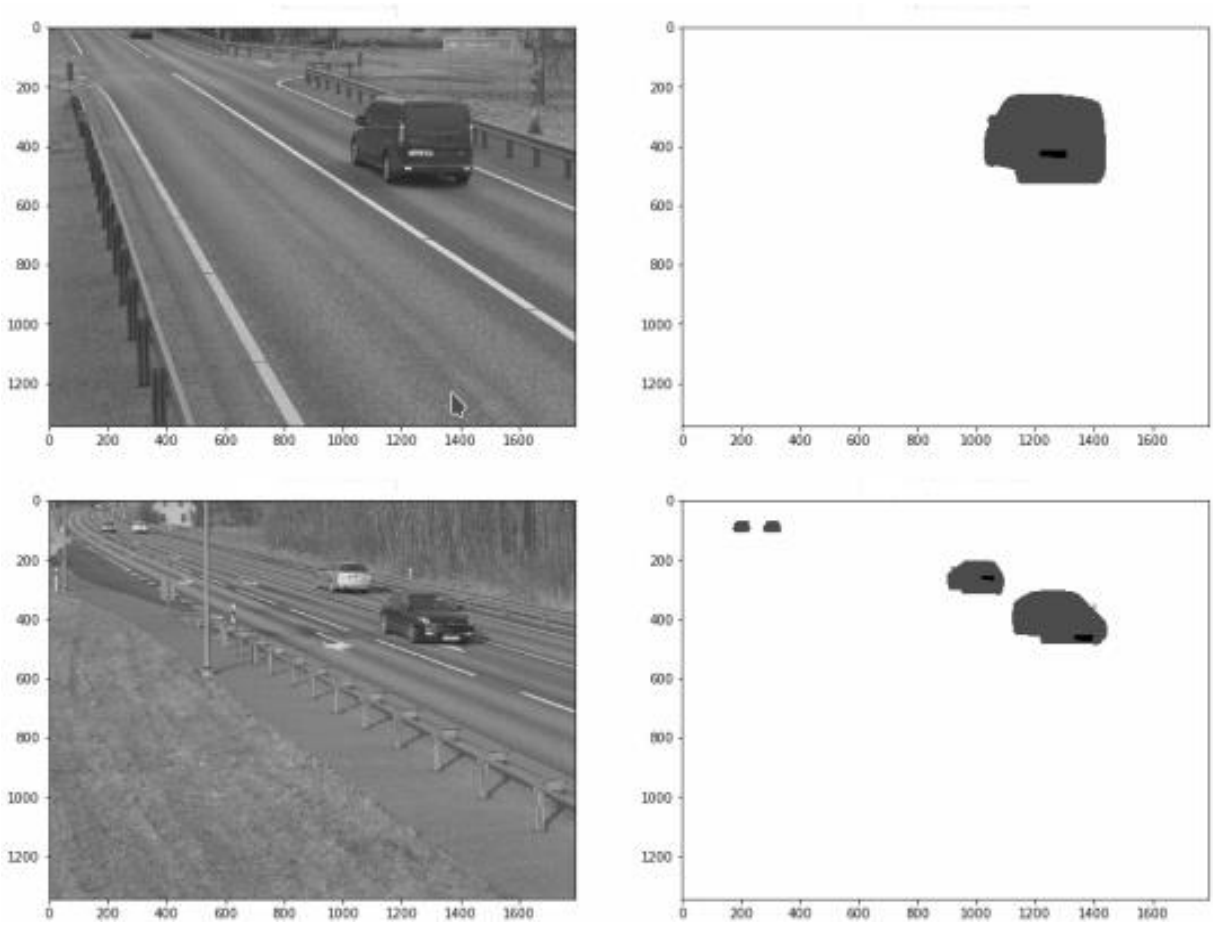

Fig. 4. **Test video frames and segmentation results**

2. Reading License Plate

After the license plate has been localized, its bounding box is cut out from the input image. Before that, extra 20 pixels are added from the right and left sides of the localized bounding box, since our experiments showed, that this significantly improves accuracy of predicting the first and last characters of the numberplate. The cut-out image of the number plate is resized to height of 31 pixels, while the width is set to maintain original width/height ratio of the image. Then we take license plate image and split it in windows using sliding window approach (figure 5.). Unlike (Li H. & Shen C., 2016) and (He P. et al., 2016), the width and height of our sliding window are not equal - this is because the height and width of the license plate symbols are also different. Therefore we adjust the window width to 24 pixels, so the window size corresponds to symbol width/height ratio.

Fig. 5. **Sliding window**

All windows are passed to character reader neural network (end-to-end Tensorflow implementation) which consists of Feature Extraction Maxout CNN, Recurrent LSTM network and Connectionist Temporal Classification (CTC) networks (figure 6).

The maxout layers in Maxout CNNs are a substitute for common activation layers, such as ReLU. After the convolutional layer has created *K* number of feature maps from its inputs, the maxout layer forms groups with *g* feature maps. Within each group, maxout layer finds the pointwise maximum that becomes the output channel of the maxout layer. The processing of all groups creates *K/g* channels. Our Feature Extraction Maxout CNN is a modified version of one described in (He P. et al., 2016), which have five convolutional layers, each followed by Maxout. Our model has two additional Maxout layers while keeping the last layer just two times deeper (originally it was (1, 256) and after our modifications it is (1, 512)). Therefore, we still can just plug the output of Maxout CNN directly to Recurrent LSTM network without worrying about performance issues and dimension reduction.

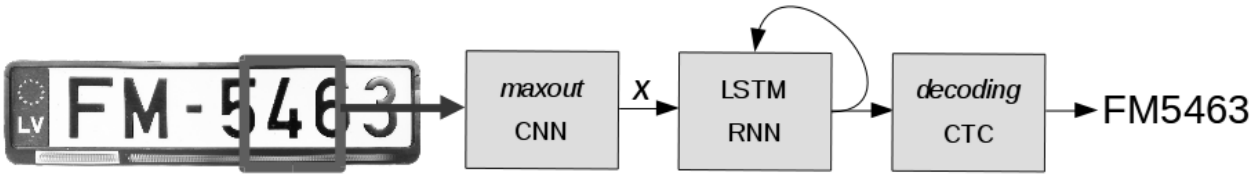

Fig. 6. **Reader network overview**

The Maxout CNN has to be trained, so it can extract meaningful features from the sliding window. The training data for Maxout CNN was gathered by using another computer vision approach. This algorithm was less accurate than the model we wanted to train, so after the algorithm detected all characters in the license plate images, a human had to validate the results and correct the errors. This resulted in a labeled dataset that we used to train our Maxout CNN. Such approach was not used in any other papers we are aware of. Figure 7. shows the simplified pipeline of the whole process. For the Maxout network, a Softmax layer is involved to train the network, then after training this last layer of Maxout network is removed. While training Maxout CNN, similar augmentation methods and generator were involved as in training of localization network.

The output of Maxout CNN is a feature vector *x* with 512 elements. The sliding window approach results in a sequence of such vectors $\{x_1, x_2,...x_n\}$, where *n* is the number of sliding windows. This sequence is fed into Recurrent Neural network, which is proven to be suitable model for sequential data. We built 2 layer RNN consisting of LSTM cells with peepholes described by (Gers F. & Schmidhuber J., 2000). The LSTM cells are connected in bidirectional manner (figure 7.) creating a Bidirectional Recurrent Neural network (BRNN). In such network, the output for current *x* is affected by preceding feature vectors as well as subsequent vectors. For each input vector *x*, the BRNN outputs a probability distribution *p*, which indicates the probabilities of *x* to belong to one of 37 possible classes. The resulting sequence $\{p_1, p_2,...p_n\}$ is as long as there are different positions of the sliding window. This sequence is then decoded by CTC network (Graves, A. et al., 2006), which is trained to convert the longer sequences of probabilities to according plate number.

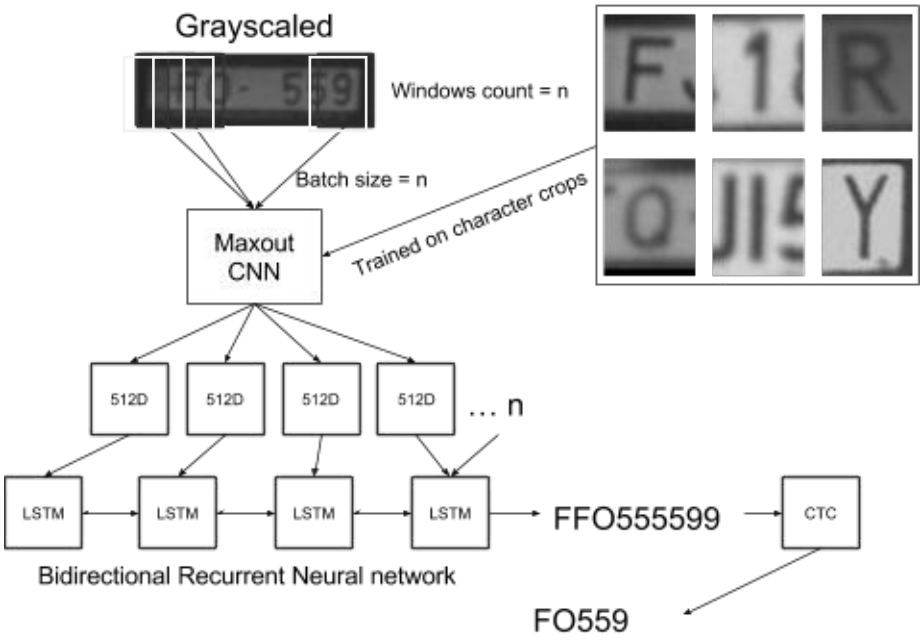

Fig. 7. **Reader network with LSTM rolled out in time**

The BRNN and CTC networks were trained simultaneously as an end-to-end machine learning system. Instead of using Momentum optimizer (as similar papers suggested) we used Adam Optimizer with 0.001 initial learning rate. With Adam Optimizer our network fitted much faster than with Momentum, thus decreased the training time. Again, while training recurrent neural network we implemented generator and image augmentation.

Results and Conclusions

The proposed combination and modifications of existing neural network based approaches resulted in an accurate number plate detection and recognition system. The number plates are correctly located in 99.5% real world images, and the overall recognition accuracy is 96.7%. Character level recognition accuracy is 98.8%. In addition, the same system also detects the type and location of the vehicles. The test dataset consisted of real life images, including blurry and noisy examples with dirty and hard to read license plates.

The use of transfer learning and the proposed learning setup significantly reduced the time and cost of model training. In addition, the fine-tuning of pre-trained model requires smaller training dataset than training of a network from scratch, since most layers of the network are already trained to generalize well on image feature extraction. The proposed data augmentation techniques also proved to be successful at improving robustness of the model without additional labeled data.

While the training of proposed system was performed on a GPU, the tests were carried out on a CPU with just a single core. When running on GPU end-to-end system processes 5 images per second, while running on Intel Xeon 2.4GHz CPU it takes 8 seconds to process a single image. As is usual for deep learning based computer vision systems, our system is specifically adjusted to work on GPU. Our future work involves optimization of the system for mobile devices, with the goal to process at least 40 frames per second. Possible steps to achieve this is by decreasing the sizes of the sliding window, the localisation network and extracted features. Unfortunately, this will result in the loss of accuracy - both in localization and in plate number reading.

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EVALUATION OF THE EFFICIENCY OF PROJECTS IMPLEMENTED ON THE BASIS OF THE PRINCIPLES OF PUBLIC-PRIVATE PARTNERSHIPS

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Abstract. This article analyzes the methodology for assessing the efficiency of projects implemented on the basis of the principles of public-private partnership (PPP). The stages of evaluation of the efficiency of projects, their implementation in the conditions of development of the regulatory and legal framework in the field of PPPs in the Republic of Belarus are disclosed. The article explores the specifics of assessing the efficiency of PPP projects abroad. An analytical review of foreign methods for assessment of the effectiveness of PPP projects has showed that the following indicators should be included in the national methodology: debt load (helps objectively assess the credit load of a private partner before attracting new loans and credits); Liquidity (solvency): an indicator of current liquidity, fast liquidity; Budgetary efficiency: assessment of the increase in the budget load as a result of the adoption of additional obligations, the risks of project implementation (the risk of underutilization of the facility), the discounted indicator of budget efficiency, the budget efficiency index, etc. It seems that the least developed are the issues of the balance of interests of the project stakeholders. Ignoring the need to take into account the interests of the parties in PPP projects increases the risks of the project, which can become a negative factor for the national economy of the country as a whole.

The authors formulated provisions for improving the current methodology for assessing the effectiveness of PPP projects in the Republic of Belarus.

For the purpose of the achievement of the aim, the authors apply generally accepted economic research methods.

Keywords:*effectiveness, evaluation, foreign experience, methodologies, public-private partnership (PPP)*

JEL code: H41, H42, H43, H54, L32, L33, G38

Introduction

The implementation of public-private partnership (PPP) projects implies control by the management bodies over efficient use of financial, human and natural resources, which makes the assessment of the overall economic effectiveness of PPP projects actual. The actual methodological problem of implementing PPP projects is the lack of a unified methodology for assessing their effectiveness. As practice shows, the evaluation is carried out according to economic indicators, which are used both for investment projects and for PPP projects. The study has revealed that the effectiveness of PPP projects is assessed in terms of the financial performance of the project in the Republic of Belarus, including key indicators of the investment attractiveness of NPV, WACC, DPP, IRR, PI and financial stability indicators EBIT, EBITDA, DSCRt; on the socio-economic efficiency of the project, which is determined taking into account the specifics and scope of PPP application.

The authors propose to set forward the object of the research: compare the national methodology for assessing the effectiveness of PPP projects with foreign methods, as well as to formulate provisions for improving the current methodology for assessing the effectiveness of PPP projects in the Republic of Belarus.

In order to achieve the target it's necessary to carry out the following tasks:

- to analyze the methods of assessment of the effectiveness of projects implemented on the basis of the principles of PPP;
- to disclose the stages of assessment of the effectiveness of PPP projects and their implementation in the context of the development of the regulatory framework in the field of PPPs in the Republic of Belarus;

- to explore the specifics of assessment of the effectiveness of PPP projects abroad.

There are applied methods of general scientific research in economics: economic analysis and synthesis, logically – constructive, qualitative methods including the methods of the analysis of normative acts.

The theoretical and methodological grounds of the paper are the normative acts regulating PPP, works produced as by Belarusian so foreign scientists and Internet sources.

Research Results and Discussion

Public-private partnership (PPP) is a relatively new concept in the Republic of Belarus, therefore the understanding of its basic principles varies among public and private sector representatives. Nevertheless, the PPP Center was established at the Economic Research Institute of the Ministry of Economy of the Republic of Belarus in April 2014, which was transferred to the structure of the National Agency for Investments and Privatization in September 2016.

The PPP center has such functions as:

- evaluation of proposals for the implementation of PPP projects, including the concepts of PPP projects;
- maintainance of PPP projects' list approved by the Interdepartmental Infrastructure Coordination Council (IICC);
- organizational, technical and information support for the work of IICC;
- participation within its competence in the improvement of legislation regulating PPP issues, including the preparation and evaluation of PPP projects;
- preparation of methodological and methodological materials on PPP issues, including preparation and implementation of PPP projects;
- organization of advanced training of specialists of state bodies, private organizations, banks and other interested parties on PPP issues;
- ensuring interstate exchange of experience in the development of PPPs, including participation in expert working groups on PPP.

The legal basis for PPP development in the Republic of Belarus consists of the following normative-legal acts:

- The Law of the Republic of Belarus "On Public-Private Partnership" dated December 30, 2015 No. 345. Which is aimed to attract investments into the economy of the Republic of Belarus, defines the legal conditions for PPPs, regulates public relations that develop in the process of concluding, executing and terminating PPP agreements (Law of the Republic of Belarus " On Public-Private Partnership projects", 2016);
- Decree of the Ministry of Economy of the Republic of Belarus "On Public-Private Partnership" on July 27, 2016 number 49. It contains the forms of the concept and the passport of the PPP project, the list of risks for the projects is stated, as well as the instructions "On the requirements of the concept of the public-private partnership project, to the feasibility study of the proposals for the public-private partnership project and to the tender documentation" and "On the evaluation of proposals for the implementation of public-private partnership projects"(Decree of the Ministry of Economy "On Public-Private Partnership projects", 2016);
- National Infrastructure Plan (NPI) 2016-2030, which facilitates the analysis of the state of the infrastructure of the Republic of Belarus; The formation of a common vision of the existing infrastructure needs of the state in various sectors of the economy for the current and long-term perspective with a view to efficiently planning the available resources and forming a strategy for the infrastructure development of the Republic of Belarus; Implementation of infrastructure projects taking into account their priority; Determine the amount of the budget deficit to finance the existing infrastructure needs and the necessary actions of the state to overcome it; Implementation of measures to improve the state of the environment through the introduction of new technologies and infrastructure development; Development of PPP in the Republic of Belarus (National infrastructure plan 2016-2030, 2015).

However, the legal basis of PPPs, to the present day, to some extent contradicts the Budget, Investment and Tax Codes, land legislation. Therefore, it is necessary to carry out a complex of works on the settlement of legislative contradictions, to meet the interests of public and private partners.

Legislatively it is determined that PPP in Belarus can be carried out in different spheres: road and transport activities, communal services and public services, health, social services, education, culture, law enforcement, energy, agro-industrial complex and in other spheres. The NPI for 2016-2030 estimates the need for investment in the main areas of the infrastructure of the Republic of Belarus (Table 1).

Table 1

Assessment of the need for investment in the main areas of infrastructure for medium and long-term prospects (Million US dollars)

Infrastructure directions	Until 2020	2021-2030 years
TOTAL,	**18 060.3**	**44458.3**
including:		
social infrastructure	2870.3	6885.2
transport infrastructure	5600.0	17441.0
energy infrastructure	1757.9	2609.2
utilities	7832.1	17522.9

Source: National infrastructure plan 2016-2030 –Republic of Belarus, 2015

The analysis of the financing costs of the infrastructure of the Republic of Belarus in the framework of the national infrastructure plan shows that the amount of annual investments in the period from 2006 to 2014 was about $ 2 billion. The total investment requirement for the period from 2016 to 2030 is estimated at 62, 3 billion US dollars. If the previous volumes of financing are preserved, only about $ 30 billion would be invested in the construction and reconstruction of the infrastructure, which is 48% of the total need for investment in infrastructure facilities. Thus, the infrastructure gap (deficit) is projected at $ 32.3 billion, or $ 2.15 billion annually (National infrastructure plan 2016-2030, 2015).

In this regard, we believe that PPP will be an effective mechanism for attracting investments and technologies in the implementation of infrastructure projects in the Republic of Belarus. PPP can significantly accelerate the pace of implementation of projects, given that in recent years, there has been a trend towards a decrease in the allocation of funds from the budget. Thus, PPP as a new form of interaction between the state and the private sector will allow:

- to overcome the limited possibilities of budgetary financing for the implementation of social and infrastructure projects;
- to develop the country's economic potential;
- to use effectively the advantages of a private partner in order to improve the quality of life of the population and the quality of the services provided;
- to increase the efficiency of management of public infrastructure facilities with limited budget financing opportunities for these purposes.

Since the implementation of PPP projects presupposes strict control over the effective use of financial, human, natural resources, the issue of assessing the overall economic effectiveness of projects implemented on the basis of PPP principles becomes actual.

At the moment, a serious problem for the implementation of PPP projects is the lack of an unified methodology that could be used to assess the effectiveness of these projects. In practice, similar algorithm is used for the implementation of PPP projects both in Belarus and abroad. The evaluation is carried out according to economic indicators, which are used for both investment projects and PPP projects.

The Instruction "On the evaluation of proposals for the implementation of public-private partnership projects" was approved in the Republic of Belarus in the summer of 2016, which establishes the methodology for evaluating proposals for the implementation of PPP projects, based on the method of assessment of the effectiveness of the PPP project and determination of the comparative advantage. When evaluating proposals for the implementation of a PPP project, an evaluation of the effectiveness of the project (prior to assessing the comparative advantage) are carried out according to the indicators of financial efficiency and the social and economic efficiency of the project (Table 2).

Table 2

Evaluation of the effectiveness of the PPP project

Index	Calculation procedure	Efficiency of the project
Evaluation of the financial efficiency of the project		
Net Present Value (*NPV*)	$NPV = \sum_{i=1}^{T} \frac{FCF_t}{(1+r)^t}$ t – year of project implementation (The first year is the year of the planned conclusion of the PPP agreement); T – total number of years of project implementation; FCF_t – free cash flow for the project in the year$t$, the corresponding net profit plus depreciation and interest payable minus investment costs; r – the discount rate used to calculate the financial effectiveness of the project.	$NPV > 0$
Weighted average cost of capital (*WACC*)	$r = WACC = (C_e \times W_e + C_d \times W_d + C_b \times W_b)/10000$ C_e – the cost of own funds of the private partner, %; W_e – share of own funds of a private partner, %; C_d – the cost of the credit (borrowed) funds %; W_d – share of credit (borrowed) funds, %; C_b – the cost of budget financing (republican and / or local budgets), %; W_b – share of budgetary financing (republican and / or local budgets), %. The value of the own funds of a private partner is taken equal to the bigger than the interest rate on government bonds with a maturity close to the forecast period, plus two to three percentage points or corresponds to a different reasonable interest rate. The cost of budget financing can be taken equal to the interest rate on government bonds with a maturity close to the forecast period.The share of own funds, credit (borrowed) funds and budget financing (republican and / or local budgets) is determined in relation to the investment costs of the project.	$WACC < IRR$
Additional evaluation of investment attractiveness		
Discounted payback period (*DPP*)	$DPP = \frac{\lvert NPV_q \rvert}{CF_{q+1}} + Q$ q –year in which the NPV last takes a negative value; CF_{q+1}– discounted free cash flow for the project in the year $q + 1$; Q – number of years to year q (inclusive).	$DPP <$ the project review period

Internal rate of return (*IRR*)	$\sum_{i=1}^{T} \frac{FCF_t}{(1+IRR)^t} = 0$ Reflects the value of the discount rate at which $NPV = 0$.If $IRR > r$, the project provides a positive NPV and a percentage of revenue equal to (IRR-r). The investor compares the IRR with the rate of attracted financial resources (cost of capital, *CC*).	*IRR>WACC*, the higher the IRR, the more effective the project; *IRR>CC*
Profitability index (*PI*)	$PI = \frac{NPV_t + I_t}{I_t}$ I_t – the cumulative amount of investment costs for the project (with discounting) in the year *t*.	*PI*>1
Debt Service Coverage Ratio($DSCR_t$)	$DSCR_t = \frac{CFADS_t}{P_t + F_t}$ $CFADS_t$ – free cash flow available for the repayment of debt at loans (loans), the corresponding balance of cash at current (operating) activities minus the investment costs of the project (when planning to receive the income from the investment activities in the project, income is also recorded in CFADSt) plus cash Contributions of participants and other sources of financing investment costs for the project in the year *t*; P_t – the principal amount of long-term loans (loans) repayable in the year t; F_t – the amount of interest and other financial costs of long-term loans (loans), payable in a year *t*.	$DSCR_t$ = 1,2–1,5
Evaluation of socio-economic efficiency of the project		
Increasing the level of employment	$E_{em} = T_a \times B_a \times N$ T_a – average term of stay of the unemployed on the account in the republican employment service, months; B_a – average monthly unemployment benefit per person, rubles; N – the number of unemployed people involved in additionally created workplaces in the process of project implementation, people.	
The increase in the quantity of provided budget services	$E_{bs} = N \times C$ K – number of buyers of budget services, people; C – cost of budgetary services, rubles.	
Growth of gross regional product	$E_{GRP} = P \times \Delta GRP \times R$ P – the population whose quality of life is improved as a result of the project through the provision of more services, increased accessibility of services or better services; ΔGRP– the growth of the gross regional product per capita according to the projected estimates for the settlement year of the project, rubles;R – forecasted growth rate of gross domestic product due to the implementation of social activities.	
Social impact in healthcare		
Improving the quality of health care, maintaining public health	$E_h = \Delta N_m \times (GRP_{man\text{–}day} + W_{ad} + C) \times N_p$ N_m– reduction of morbidity and a reduction in the number of absentee days for work due to sickness against the actual balance of working hours as a result of prevention and improvement of the quality of medical services, days; $GRP_{\text{man-day}}$– average daily gross regional product per capita, rubles / man-	

	day; W_{ad} – the average daily wage of the worker at stay in temporary disability, rubles; C– cost of outpatient or inpatient treatment of one patient, rubles / man-day; N_p – the number of people working in the area where the facility will operate.
Increasing life expectancy and reducing disability	$$E_{le} = T_p \times R_d \times (GRP_{man-day} + B_d)$$ T_p – total working-age population, thousand people; R_d – reduction of the incidence rate per type of disease per 1000 inhabitants; B_d– average amount of disability benefits, loss of breadwinner, etc., rubles / person-year.

Source: author's elaboration based on the study of the scientific literature

The dynamics of values according to the indicators predicted during the project implementation is also analyzed:

- gross profit and profit from sales of goods (works, services);
- earnings before interest and taxation (EBIT), corresponding to earnings (loss) before taxation plus interest expense;
- earnings before depreciation, interest accrued, as well as taxes from the profit (EBITDA), corresponding to EBIT plus depreciation;
- the net profit of the project;
- profitability of sales, calculated by EBIT and EBITDA, as well as net profit and other indicators.

The social and economic efficiency of the project is assessed taking into account its specifics and the scope of PPP implementation on the basis of identifying: qualitative (quantitative) social effects, in kind, which is not taken into account in calculating the financial effectiveness of the project and monetary social effects, that is, project results that are amenable to monetary evaluation according to a specially developed methodology (Table 3).

Table 3

Evaluation of socio-economic efficiency of the project

Social effect	Indicator
Qualitative (quantitative)	- the number of created jobs; - raising the level of preschool education (the sphere of education); - reducing the number of accidents in the production and transmission of heat and electricity (energy sphere); - reducing the level of environmental pollution in the case of construction of waste processing systems (municipal services); - reduction of the harmful impact on the environment by expanding the use of modern trucks in the domestic market (transport sphere); - creation of conditions for competition in the market, which will be an incentive for improving the effectiveness of the work in the relevant field, and others, depending on the specifics of the project and the scope of PPP implementation.
Monetary	- the social effect of increasing the level of employment of the population; - the social effect of increasing the number of budget services provided; - the social effect associated with the growth of the gross regional product; - other indicators calculated by local methods.

Source: author's elaboration based on the study of the scientific literature

The total social and economic effect in monetary terms is defined as the sum of possible monetary social effects. In connection with the social orientation and the importance of infrastructure projects in the Republic of Belarus, when calculating the financial effectiveness of the project, the values of the total social and economic effect are taken into account.

Further risk assessment and comparative advantage will be carried out if the project is recognized to be effective for these indicators. The comparative advantage is determined on the basis of the ratio:

- net discounted expenditures of the budget of the Republic of Belarus when implementing the project using the PPP scheme;

- net discounted costs for the facility when it is financed from the budget or with external government loans, external guaranteed loans (in case of their repayment from the budget) (PBV);

- the total amount of liabilities accepted by the state partner in case of risks in the implementation of the project under the PPP scheme and the budget scheme (PRV) (taking into account discounting).

Of course, this is not the whole list of indicators that can give the most full and correct idea of the effectiveness of PPP projects, so the issue of improving the methodology for assessing the effectiveness of PPP projects, for their proper choice, becomes topical.

In addition, it is relevant that at the stage of evaluating the proposals for the implementation of the PPP project an evaluation mechanism is established, which allows for regular performance calculations throughout the life of the partnership. In order to do this, to create a kind of monitoring system for assessment the effectiveness of PPP projects, reflecting the necessary changes in the scope of the project, as well as satisfying each project participant during its implementation.

The analysis of international practice shows that financial development institutions and commercial banks that finance the implementation of large-scale national economic projects, projects involving the state, use a system for monitoring development results, which allows assessing the contribution to development from the implementation of the entire portfolio of investment projects.

Monitoring of development results is carried out on a regular basis by the project groups International Finance Corporation (IFC) and Independent Evaluation Group (IEG), which is an independent division within the World Bank Group. Depending on the project implementation segment, the appropriate scale of assessments (Table 4).

Table 4

Scale of investment project effectiveness evaluation

Indicators	**Projects**	
	Real sector	**Financial sector**
Financial: the financial result from the project implementation should be higher than the value of the company's weighted average cost of capital (*WACC*)	The real rate of return of the project in financial terms *(FRR)* is compared with *WACC*. Scale of assessment: - excellently: *FRR* ≥ *WACC* + 2,5% -satisfactorily: *FRR* ≥ *WACC* - partially unsatisfactorily: *FRR* ≥ *WACC* - 2,0% - unsatisfactorily: *FRR*<*WACC*- 2,0%	The return on equity compared with the cost of equity capital (*COE*). Scale of assessment: - excellently: *ROE* ≥ *COE* + risk premium; - satisfactorily: *ROE* ≥ *COE*; - partially satisfactorily: *ROE*<*COE*; - unsatisfactorily: *ROE*<risk-free rate of return
Economic: should benefit society in addition to the benefits that investors receive	Economic rate of return on the project *(ERR)*. A number of other indicators are used to assess the quality impact. Scale of assessment: - excellently: *ERR*≥ 20% + Economic benefits, significant non-quantifiable;	Estimation of the contribution share of the project in the indicator of the overall efficiency of financial markets. Corporate loans and equity investments are valued by assessing the company's financial performance (before taxes) and determining the boundaries within which they may be distorted

	- satisfactorily: *ERR*≥ 10%; - partially satisfactorily: *ERR*≥ 5%; - unsatisfactorily:*ERR*< 5%	(subsidies, interest or exchange rate fluctuations, changes in the real sector). For trust funds, the volume and indicators of a significant share of the asset portfolio. Scale of assessment: - excellently: economic return on equity of the company (*EROE*)≥ *COE* + risk premium; - satisfactorily: *EROE* ≥ *COE*; - partially satisfactorily: *EROE*<*COE*; - unsatisfactorily: *EROE*<Risk-free rate of return
Ecological and social indicators	Projects must comply with environmental and social standards of IFC's. Scale of assessment: - excellently: project indicators above the established standards of IFC's activities; - satisfactorily: the project meets the activity standards; - partially unsatisfactorily: the project according to several parameters do not meet the standards, but measures to eliminate inconsistencies are accepted; - unsatisfactorily: irresistible, obvious inconsistency with IFC standards without the prospect of taking corrective measures in a short time.	
Indicators of private sector development	The projects should improve the investment climate, attracting new investors to the national private sector, contributing to constructive changes in the legislative and regulatory framework, etc. Scale of assessment: - excellently: the project significantly improves the conditions for private sector development; - satisfactorily: the project has a clear positive impact; - partially unsatisfactorily: the project has negative consequences, expected for a short period of time; - unsatisfactorily: significant negative consequences for the development of the private sector (for example, a change in the competitive environment).	

Source: Nikonova I.A., Smirnov A.L., 2016

The matrices of development effectiveness evaluation include key and additional evaluation standards. For each project (product, service), a corresponding set of evaluation parameters is generated. Such matrices make it possible to assess the project's compliance with the minimum set of requirements (Table 5).

Table 5

Matrix assessment of the effectiveness

Key evaluation standards	**Relevance**	The project's relevance to the interests of stakeholders and the development strategy of the country is assessed; Degree of the Bank's participation in the implementation of the development strategy of other countries; Alignment of long-term development goals of countries with medium-term goals set in the Bank's development programs, etc.

	Effectiveness	The degree of achievement of financial results is estimated
	Efficiency	The degree of correspondence between the results of spent resources is estimated
	Risk	Factors that affect the financial sustainability of the project, the achievement of the results of the development of the industry are determined
	Contribution	The Bank's contribution to the achievement of the development goals of countries is estimated (macroeconomic balance, socio-economic development, environmental protection)
	General indicator of project implementation	The overall contribution is assessed taking into account all the effects from the project implementation
Additional evaluation standards	**Mobilizing role**	Institutional development: the project's contribution to the development of the country, region is assessed; Increasing of the efficiency of the use of financial, human and natural resources.Contribution to environmental protection and social development: assesses the extent to which the impact of projects on the environment, public health, human resources
	Indicator of the Bank's activity	The quality of products and services provided by the Bank is assessed; Compliance of the Bank's activities with internal corporate principles; Stakeholder satisfaction

Source: Nikonova I.A., Smirnov A.L., 2016

Foreign practice of the activities of large banks and financial development institutions demonstrates the possibility of monitoring, monitoring and evaluation of actual results and reporting to national governments.

Andreeva E.S. believes that since PPP participants are the public and private sector, the PPP project evaluation indicators should be divided into two groups: the efficiency indicators of PPP projects for the state and for the private partner (Table 6) (Andreeva E.S., 2013). But, at the same time, there are economic indicators that are equally important for the state and for the private sector (NPV, PI, IRR, DPP).

Table 6

Scorecard for assessing the effectiveness of PPP projects

Indicators of PPP effectiveness for the state		
Index	**Method of calculation**	**Explanations**
Ratio of private and budget investments (*PBI*)	$PBI = \frac{\sum F_p}{\sum F_b}$ F_p – the amount of private funds allocated to the PPP facility;F_b– amount of budgetary funds	The level of budgetary load reduction, the ideal ratio under PPP conditions is parity (50:50), but in modern conditions, the PBI = 1 is the minimum allowable condition, hence: PBI ≥ 1
Reduction of the unemployment rate (*U*)	$U = \frac{N_j}{N_u} \times 100\%$ N_j– number of new jobs created within the framework of the PPP project; N_u – the number of unemployed in the country (in the region).	The possibility of PPP projects to create and maintain employment. With a positive value, unemployment decreases, the higher the *U* value, the better the further socioeconomic development of the region

Increase in tax revenues to the budget (*TR*)	$TR = \frac{TR_c}{TR_{c-1}} \times 100\%$ TR_c, TR_{c-1}– the amount of tax revenue for the current and previous periods, respectively.	Shows how much the budget revenues increased as a result of PPP implementation. The higher the value of this indicator, the greater the benefit of the state
Share of innovative products (S_{ip})	$S_{ip} = \frac{R_p}{R_t}$ R_p – revenue from sales of new or improved products; R_t – total revenue from sales of all products.	Assesses the enterprise's ability to introduce innovative products. The higher is the value of this indicator, the more innovative is the enterprise
Intellectual capacity (*IC*)	$IC = \frac{V}{O}$ $C_{ннм}$ – the value of intangible assets; Q – output volume.	It allows to determine the degree of application of innovations in the activity of an enterprise
Indicators for assessing the effectiveness of PPPs for a private partner		
Return on assets (*ROA*)	*ROA*= (Profit before taxation / Value of assets) ×100%	Characterizes the profit received by the enterprise from each ruble advances on the formation of assets
Return On Investments(*ROI*)	*ROI* = (Profit before taxation / (Balance sheet currency - Short-term liabilities)) × 100%	Expresses the effectiveness of the use of funds invested in the development of this organization
Profitability of equity capital (*PEC*)	*PEC* = (Net income / Equity) ×100%	Characterizes the presence of profit in the calculation of capital invested by the owners of this organization
Profitability of production (production activity) (P_p)	P_p= (Net profit / Cost of sales) × 100%	It shows what profit the enterprise has from each ruble spent on production and sales of products
Profitability of sales (P_s)	P_s = (Profit from sales / Proceeds from sales of products) × 100%	Characterizes the specific weight of profit as part of the proceeds from the sale of products

Source: Andreeva E.S., 2013

Gabdullina E.I. developed an algorithm for assessing the effectiveness of regional PPP projects, which allows you to determine the feasibility, validity of the project, the best form of its implementation. At the second stage, this algorithm, conclusions are drawn about the value of partnerships, based on various types of the efficiency category (Table 7) (Gabdullina E.I, 2013).

Table 7

Evaluation of the effectiveness of PPP participants

Efficiency of the project as a whole	Public efficiency	Gross national product, employment and income level of the population, participation in the international division of labor.
	Commercial efficiency	

Efficiency of participation in the project	Efficiency for participants	Net present value; Internal rate of return; payback period; Need for additional financing; Weighted average cost of capital; Value of capital assets
	Regional, branch efficiency	Competitiveness of the enterprise, growth of incomes of the adjacent enterprises, the international integration, ecological safety
	Budget efficiency	Incomes to budgets of various levels in the form of taxes, excises, duties, etc.

Source: Gabdullina E.I., 2012

To assess the effectiveness, depending on the complexity of the project Gabdullina E.I. It is suggested to use various methods and tools, from the simplest calculations, to the most complicated analysis of " costs - benefits" (Table 8).

Table 8

Methods for assessment of the comparative effeciency of PPP projects depending on the level of complexity

The level of difficulty	**The name of the method**		**The base of comparison**
The highest	The complete analysis"cost-benefit"		Traditional project
Average	Public Sector Comparator	before the selection procedure of the winner of the competition	Traditional project
Average		after the procedure of selecting the winner of the competition	Traditional project
The lowest	Competitive bidding procedure		Other PPP project

Source: Gabdullina E.I., 2012

Thus, studies of the problem of the effeciency of PPPs are of great interest in the global professional community. In the methodologies studied, the evaluation of the effeciency of projects varies from rigorous optimization to multivariate generalization analysis, both for each project participant and for society as a whole.

Conclusions, Proposals, Recommendations

1. In conclusion, we note that the evaluation of the efficiency of PPP projects in the Republic of Belarus is carried out:

- on the financial efficiency of the project, which includes key indicators of the investment attractiveness of NPV, WACC, DPP, IRR, PI and financial stability indicators EBIT, EBITDA, DSCRt;

- on the socio-economic efficiency of the project, which is determined taking into account the specifics and scope of PPP application.

2. In the Republic of Belarus, the methodology for the assessment of the efficiency of PPP projects is more focused on the assessment of the efficiency of the state's participation, rather than a private partner. This is due to the specific understanding of the PPP mechanism, which consists of saving budget funds, attracting private investments in activities that are not of interest to a private partner due to a long payback period, low profitability, etc.

3. An analytical review of foreign methodologies for the assessment of the efficiency of PPP projects has shown that the following indicators should be included in the national methodology:

- debt load, which helps objectively assess the credit burden of a private partner, before attracting new loans and credits;

- liquidity (solvency): an indicator of current liquidity, fast liquidity;

- budgetary efficiency: assessment of the increase in the budget load as a result of the adoption of additional obligations, the risks of project implementation (the risk of underutilization of the facility), the discounted indicator of budget efficiency, the budget efficiency index, etc.

4. The Belarusian method does not fully take into account the effect of partnership, which can be assessed by comparing financial indicators with different project implementation options - only by the state, only by the private sector and by partnership. The existing approach does not reflect the benefits received by each participant and are often due to the manifestation of synergistic effects from interaction. The benefits of society are, in fact, excluded from the evaluation of the efficiency of the project.

It should be noted that the issues of the balance of interests of the project stakeholders are the least developed. Ignoring the need to take into account the interests of the parties in PPP projects increases the risks of the project, which can have negative consequences for the economy as a whole.

5. Thus, the authors formulated the following concepts:

- the PPP project should have the necessary level of efficiency for the stakeholders of the project - society, the state and the private sector;

- the PPP project should meet the needs of the region's social and economic development;

- the PPP project should be based on the financial, industrial, labor and natural resources of the region.

The public utility of the PPP project is a qualitative indicator and is based on the project evaluation by the population of the region. This indicator is introduced due to the need to include society in the development of PPPs in the region. Assessment of this indicator is carried out by sociometric methods.

The project evaluation should take into account the sectoral and territorial aspects of regional development and reflect the impact of project results on the development indicators of a particular industry and territory. In addition, the assessment should include indicators of the needs of the population, the breadth of the population's results of the project and others.

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DETERMINANTS OF ATTRACTIVENESS OF SPECIAL ECONOMIC ZONES TO FOREIGN INVESTORS IN POLAND. RESULTS OF AN EMPIRICAL STUDY

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Abstract. Special economic zones (SEZs) are systematically gaining in popularity as tools of investment policy particularly in developing and emerging economies. Since the first contemporary industrial SEZ was established in Shannon, Ireland in 1959, their population has grown over the years to reach 4,300 in more than 140 countries. The vast majority of them started to operate after 2000 (The Economist, 2015).

The study on SEZs conducted in Poland and discussed in this paper focuses on the assessment of factors decisive for the success of a particular zone among foreign entrepreneurs seeking investment locations to pursue economic operations. Due to the unprecedented number of zones in the new EU Member States for a single country, their long presence and relatively high importance for the economy, Poland makes a good case for research.

The paper aims to identify the importance of factors, which explain why some SEZs in Poland attracted more FDI than others. In our opinion, that might be caused by the following three fundamental reasons: location of the zone in a more or less attractive region (equivalent to a voivodeship); investors' opinion about the zone (its reputation); and top quality performance of zone managing companies (ZMCs). Each of the above reasons was also analysed in more detail. Their priority order may provide some guidelines for those who implement regional policy, also through the SEZs, in Poland and in other countries. Our calculations have shown that efforts of ZMCs with regard to attracting FDI are crucial.

Key words: *special economic zones, FDI, Poland*
JEL code: F21, F23, R11

Introduction

The term SEZ covers many varieties of the tool, often known under different names[1] (e.g., *export zones*, *free enterprise zones*, *industrial zones*, *free zones*), depending on the task entrusted to zones by the state and the type of aid offered to investors. The aid may be quantifiable (tax allowances, financial assistance) or unquantifiable (regulatory, infrastructural or administrative privileges). Eligibility for such aid usually depends upon meeting certain criteria, which is why zones cannot be classified into one category of investment incentives.[2] Zones may be public or private, they may even be owned by foreign capital.[3] In developing countries they are established to develop export production, one of the major barriers to growth. They may also help to modernise institutional and economic structures of a particular region or country (Farole, Akinci, eds., 2011) by offering space for experimenting with market mechanism. The inflow of foreign direct investment (FDI) is vital for achieving these goals.

Since by establishing SEZs countries deviate, sometimes quite radically, from formal institutional systems of their respective economies, overall economic consequences of such dualism have been the subject of extensive theoretical and empirical studies in various countries for many years (e.g, Aggarwal 2012, Farole, Akinci, eds., 2011, Jensen, Winiarczyk

[1] Sometimes they are used as SEZ synonyms, e.g., on the websites of national organizations, which promote a country to foreign investors.
[2] For instance, James (2013) considers SEZs as fiscal instruments while VCC (2013) puts them into *business facilitation* category.
[3] For instance, in mid-2010 in Africa six zones were being built; 2 of them were 100% owned by Chinese capital and 4 were joint ventures with minority shareholding of the host countries. The government of China treats them as auxiliary to Chinese direct investment (Brautigam, Xiaoyang, 2011).

2014, Yeung, Lee, Knee 2009). Yet, supporters of various schools of thought and research methods have not provided an unequivocal answer (Aggarwal, 2012). A joint conclusion based on the review of available studies (Baissac, 2011) informs us that SEZs consequences depend on the context: under certain circumstances zones may become important growth catalysts, on other occasions they may produce minor short-term benefits but sometimes may lead to the reduction of welfare and impede liberalisation of the economy.

Another thread in studies on SEZs explored in this paper on the example of Poland focuses on the assessment of factors decisive for the success of a given zone amongst foreign firms[4]. We believe that like countries (and regions), individual zones may be more or less appealing to entrepreneurs. This aspect however, has not received any particular attention although it is important for the new EU Member States where SEZs are regional policy tools[5]. Due to the unprecedented size of SEZs population, much bigger than in any other new EU Member State, their long track record and relatively high importance to the economy (for more see below), Poland makes a good case study.

The goal of this paper is to identify the importance of factors, which explain why some SEZs in Poland have attracted more FDI than others. In our opinion, that may be due to three principal reasons: zone's location in a more or less attractive region (in this case a voivodeship); investors' opinions about the zone (its reputation) and the quality of zone administrators' services. Each of the above reasons was also analysed in more detail. Their priority order may provide some guidelines for those who implement regional policy, also through the SEZs, in Poland and in other countries. The study uses statistical methods, such as Spearman's rank correlation, Pearson correlation and a regression model.

1. Principal opportunities and investment terms in SEZs

SEZs have been present in Poland since 1995.[6] Investment opportunities and conditions offered by the Polish government to all investors, Polish and foreign alike, have evolved since then in response to internal and external circumstances. The first ones were connected with the experience gathered from zones operations (their number was changing, the duration of time for which they were established extended and their territories expanded) and new accents put in economic policy. Initially, zones were expected to mitigate social and economic tensions caused by the so called shock therapy in 1990 (Balcerowicz 1992) in areas burdened with inefficient industrial plants inherited from the communist system (Jensen, Winiarczyk, 2014). Over time, as a result of transformation, zones have turned increasingly more into tools of regional policy. External circumstances, which influenced zone-related regulations were connected with the accession of Poland to WTO and its Subsidies Agreement in 1995. Most important was the necessity of harmonizing Polish state aid rules with those of the EU. This occurred in 2001 and continued after Poland joined the EU in 2004.

However, principal forms of support available in SEZs have remained unchanged. According to investors, corporate income tax (CIT) exemptions are the most attractive incentives (KPMG, 2014). They apply solely to operations carried out within the zones. The total amount of income tax exemption is calculated in relation to costs eligible for state aid. The latter can be calculated in two ways: as investment outlays or, secondly, as 2-year real cost of hiring new staff.

The second type of support in SEZs consists in offering investment plots with fully developed infrastructure, often attractively located, which can be purchased or leased on preferential terms. They are developed by territorial self-government units or by zone administrators who are companies owned by the State Treasury. The third type of support consists in the provision of necessary infrastructure, such as connecting roads, water and wastewater, gas, and energy pipelines and installations. The fourth type of support consists in assistance offered by zone administrators in legal and

[4] For a long time economists and specialists in other disciplines have been trying to answer the question why foreign investors are choosing a particular country or region as a place for their projects. For an extensive literature review see Nielssen, Rasmussen, Weatherall (2017).
[5] In 2014 state aid granted in SEZs as tax exemptions represented over 98% of such aid in Poland and 35% of total regional aid (Report on State aid…2015).
[6] Based on the Act of 20. X. 1994 on Special Economic Zones. Consolidated text see the Journal of Laws of the Republic of Poland 2015, item 282 (hereinafter: Act on SEZ).

organisational matters connected with starting a business, as well as cooperation in finding new employees and local suppliers of goods and services. Finally, the fifth type includes property tax exemptions granted by municipal authorities of the commune, where the zone is located.

Investing in a zone, the pre-condition for becoming eligible to benefit from the above preferences, is neither easy nor cheap, meaning economically weak operators are eliminated "ex-ante". Transaction costs are linked, with, firstly, the need to obtain an investment permit; the procedure differs depending on whether land is situated within the zone or outside of it (e.g., drafting the Letter of Intent, purchasing tender specification, filing a bid, awaiting the tender or negotiations based on public invitation, negotiations, awarding the permit) [7]. This procedure may take even a year, depending on the zone, a particular investment location and type of property rights to the land.[8] Secondly, enterprises based in zones pay companies, which manage the zones (ZMCs) for administration, inter alia, for monitoring if investors comply with obligations specified in their permits. Their reporting system is subject to frequent verification. Thirdly, to receive aid, an enterprise must operate sufficiently long within the zone (at least 3 – 5 years); it must also take into account potential necessity to pay the aid back (with interest) if its permit expires or is withdrawn because it does not comply with conditions specified in it.

Changing accents in economic policy, besides the above mentioned high requirements for investors, can be noticed the most clearly by looking at the list of operations perceived as welcome and non-welcome in SEZs. In the first group the government included innovative projects, projects delivered in priority sectors[9], projects supporting development of clusters, as well as industrial and technology parks (Development of Special Economic Zones: Concept, 2009). Industries, which do not merit SEZ support are: mining, manufacturing of explosives, and excise goods. Several dozen services were excluded as well, such as wholesale trade and repairs, information and communication, finance and insurance, collecting and recycling of waste. Permits are also not granted in cases laid down by respective EU legislation, which have excluded sectors such as manufacture of basic agricultural products and the fishing sector from the zones (Regulation EC no. 651/2014).

The currently pursued policy is also reflected in the evolving attitude to how a zone territory is delineated vis-à-vis the rest of the country territory. Since the area is delineated in legal, not physical sense, investors have more and more frequently selected plots (subzones) not necessarily located in regions where state aid is needed. As a result, an office building or even part thereof may become a subzone. By including investors' private land into zones, SEZ areas are adjusted to the needs of specific categories of investors. In this case, one of the criteria in applying for a permit is to offer R&D and BPO services.

When selecting a particular zone for its operations, an investor may be guided by support available in the zone. EU regulations on regional aid are a reference point for these preferences. Maximum aid ceilings are territorially differentiated and have been changed three times already (Trzciński et al., 2016). Since January 2018, depending on the voivodeship, they will range from 10% to 50% of costs eligible for aid (Regulation of the Council of Ministers of 10 December 2008). The most privileged are the least developed regions with the highest unemployment rate, i.e., those in the eastern part of the country. The lowest support is available to projects in Warsaw, the richest city in Poland. State aid intensity may be increased by 20 percentage points for small and 10 p.p. for medium-sized enterprises.

[7] From 1994 until February 2017 the term "special economic zones" featured in 613 laws and regulations. Most of them addressed concrete zones (e.g. changes in the area, rules, etc.) not general issues (http://isap.sejm.gov.pl/SearchServlet, accessed 4. III. 2017). Nevertheless, due to frequent changes these regulations have become so complex that they have turned into the source of continuous workload to law firms who specialise in these issues.
[8] To accelerate project implementation investors may benefit from the so called incentive effect introduced into Polish law by EU provisions (Regulation CE no. 800/2008).
[9] Priority list includes the following sectors: automotive, aviation, electronic engineering, machine engineering, biotechnology, low tonnage chemicals, R&D, modern services, and manufacture of equipment used to produce fuels and generate energy from renewable sources (Development of Special Economic Zones: Concept, 2009).

We need to stress that incentives available to those who invest in SEZs may be combined with other forms of investment aid[10]. The most important among them are resources from the EU operational programmes and government subsidies from *the Programme designed to support investment projects particularly important for Polish economy in the period 2011-2020* (Ministry of Economy, 2011). The latter ones are addressed only to large enterprises, which is why it is hard to decide whether their presence in SEZs results from preferences available to all operators or rather from being granted government subsidy.

2. FDI in SEZs – some basic facts[11]

The total value of foreign investors' financial involvement exceeded PLN 82.5 bn representing more than 81% of all investment projects in SEZ (Table 1). These investments accounted for 11.3 % of all FDI in Poland and as much as 41.8% of FDI in manufacturing (Foreign direct investment in Poland …., 2015). Advantage of foreign investors was smaller when it comes to their share in the number of employees in zones (71.9%), while their share in the number of issued permits was the same as that of domestic investors (50.2%). It suggests foreign investments were on average more capital intensive and dominated with bigger, surely more productive, projects.

Foreign investments in SEZs are highly concentrated. At the end of 2014 almost 60% of resources originated from 6 countries: Germany, U.S., the Netherlands, Japan, Italy, and South Korea. Two zones in Poland: Katowicka and Wałbrzyska attracted almost 44% FDI (Table 1). Fifteen major investors in SEZs (out of ca. two thousand) are companies with foreign capital. At the end of 2014 they invested almost PLN 24.3 bn, i.e. 23.8% of all investment projects. The automotive sector is the best represented in this group with 61.9% of invested resources.

The majority of zones were considered highly interesting by foreign investors (Table 1). Only in three of them the share of foreign investors in total investment outlays in the zone and in the number of employed people was below 50%. New jobs, the main reason behind establishing the zones in Poland and the principal way to assess the tool, emerged mainly thanks to foreign capital. When it comes to valid permits, which may be taken as a rough estimate of the number of investors, interest in zones was evenly distributed. From that we can learn that the population of Polish investors was dominated by small and medium-sized operators, while foreign investors were mainly large businesses.

Table 1

Foreign investment in SEZ (as at 31.12.2014)

No.	Zone	FDI investment outlays in PLN million	Share of FDI investment in total investment outlays (in %) (A)	No. of valid FDI permits	Share of valid FDI permits in total permits (in %) (B)	No. of people employed by foreign investors	Share in total employment (C)	FDI importance (sum of places in rankings) A+B+C
1.	Kamiennogórska	1, 791.1	(3) 87.8	38	(5) 62.3	6145	(2) 91.2	**3**
2.	Katowicka	18,466.6	(4) 87.5	198	(3) 65.6	49079	(4) 83.2	**4**
3.	Kostrzyńsko – Słubicka	4,133.6	(9) 70.6	107	(4) 65.2	23016	(6) 74.5	**6**
4.	Krakowska	1,451.5	(11) 61.5	47	(10) 33.6	15288	(8) 69.8	**9-10**
5.	Legnicka	6,935.9	(1) 97.2	68	(1) 83.9	11606	(1) 92.1	**1**
6.	Łódzka	8,820.4	(8) 70.8	102	(7) 51.0	17706	(11) 52.5	**8**
7.	Mielecka	4,374.7	(10) 65.8	64	(11) 30.9	14320	(9) 64.6	**11**
8.	Pomorska	7,748.1	(5) 85.5	74	(6) 53.2	15326	(5) 77.9	**5**
9.	Słupska	596.1	(14) 43.1	20	(12) 26.7	887	(13) 26.1	**13**
10.	Starachowicka	861.8	(12) 45.7	26	(9) 34.2	3319	(12) 47.6	**12**
11.	Suwalska	756.5	(13) 43.9	13	(14) 16.1	1120	(14) 13.9	**14**
12.	Tarnobrzeska	6,204.3	(7) 78.1	78	(8) 42.4	16727	(7) 66.2	**7**
13.	Wałbrzyska	17,541.3	(2) 94.2	183	(2) 70.1	39876	(3) 89.9	**2**

[10] The total amount of State aid from all sources cannot exceed territorially differentiated aid ceilings.
[11] If not stated otherwise all data come from Information about the implementation of the Act on Special Economic Zones, Ministry of Economy, Warsaw, 2015.

14.	Warmińsko - Mazurska	2,904.4	(6) 78.8	15	(13) 17.6	9910	(10) 57.1	**9-10**
	Total	**82,595.1**	**81.1**	**1,033**	**50.2**	**224325**	**71.9**	**-**

Source: own compilation based on Information about implementation of the Act …., 2015 and based on the data processed (Upon authors' request) by the Department of Support Instruments of the Ministry of Economy in 2015, (as at 31 December 2014).

Considering all the above mentioned traits, i.e. amount of invested capital, number of permits and employed people, foreign investors played a major role in developing zones located close to the Western and Southern borders (Legnicka, Wałbrzyska, Kamiennogórska, Katowicka). The further East we go, the smaller interest in zones despite usually higher state aid ceilings.

3. Assumptions and data sources

We started with identifying circumstances, which might, directly or indirectly, impact the pool of FDI attracted by each individual zone as at the end of 2014. FDI pool was considered in terms of its value and the number of projects, taking account of:

1) the specificity of a particular zone. Being a collection of a multitude of factors (hereinafter referred to as intra-zone factors) it depends on: (a) ZMCs as they compete among themselves with, e.g., quality of services and financial and nonfinancial incentives they offer to investors (b) public administration at various levels (responsible e.g. for deciding on zone borders and cooperation with entrepreneurs);

2) SEZ image in investors' eyes, i.e. stemming from their subjective opinions based primarily on their own experience as businesses that operate in zones. According to some researchers, the image of a Central European country shaped by investors is sometimes more important to potential investors than 'hard' data, such as market size, labour costs or infrastructure (Orłowski, 2010). We assume that similar observation may be valid in case of zones as well;

3) economic and social environment of the zone, i.e. exogenous factors. They may be crucial for investors' interest into investing in a particular municipality within a zone. Investment attractiveness of voivodeships is the approximate measure of the quality of such environment. Since most zones are located in more than one voivodeship (six is the maximum number), all determinants of investment attractiveness of voivodeships were weighted with the share of FDI in sub- zones located in voivodeships at the level of counties (poviats).

The first group of factors in our study (intra-zone factors) includes[12]:

1.1) the size of the zone[13]. This variable was selected because we assume that the bigger the area of the zone, the more investors it may accommodate;

1.2) promotion outlays by ZMCs. Subject-specific literature resources (e.g. Harding, Javorcik, 2013) generally acknowledge the effectiveness of promotion in attracting FDI to countries and regions hence there are no grounds for challenging it at zone level where the biggest population of investors possible is of primary importance;

1.3) tax allowances for ZMCs granted when they invest in zone development[14]. Obviously, these resources, if well spent on promotion or upgrading operating conditions, may improve the attractiveness of a zone;

1.4) equity of ZMCs. Higher equity may give the managing company better access to loans that may be used to develop the zone by, e.g., providing investment plots with technical infrastructure;

1.5) the number of towns and cities where sub-zones are located. We assume that the more of such towns and cities the bigger potential agglomeration benefits (e.g. the ease of finding suppliers and employees) and better social

[12] Data come from: factors 1.1-1.8 (Information about the implementation …., 2015); factors 1.9-1.10 (Lichota, 2016).
[13] Formally, the area of the zone depends on the decision of the Council of Ministers but companies that manage respective zones can have some influence on it.
[14] Art. 25 para 2 of the SEZ Act.

infrastructure, i.e. schools offering instruction in foreign languages, hotels, restaurants, etc., which should attract foreign investors;

1.6) the number of municipalities where sub-zones are located. We assume that the more of such municipalities the better a zone meets investors' needs with respect to specific parameters of the plot. It should be reflected in a bigger number of valid permits rather than in investment value;

1.7) state aid granted to SEZ-based operators. The higher the aid, the more attractive it is to operate in a zone. State aid comes not only in the form of zone-specific tax allowances (granted by tax offices and local authorities) but also as government subsidies offered, together with tax allowances, to selected big, mostly foreign, investors;

1.8) the cost of provision and modernisation of zone infrastructure. These outlays are made by the government or local authorities at different levels, not by ZMCs. The bigger the outlays, the better the infrastructure, which may attract more investors;

1.9) the share of zone area allocated to investors. On the one hand, higher percentage of the area allocated to investors may mean the zone is more attractive to them but, on the other hand, it informs others that there is not much room left and they should look for a place in another zone or outside of zones. That is why it is hard to predict the strength and direction of the relationship;

1.10) infrastructure outlays made by ZMCs. Clearly these are smaller than the outlays of a Ministry, county or municipality. Nevertheless, managing companies may spend more or less on developing plots within respective zones, which should be reflected in the pool of investors.

The second group of variables is based on the results of a questionnaire-based study conducted by Norstat Polska from August until September 2014 and commissioned by KPMG (KPMG, 2014). The sample included 234 enterprises, at least 10% investors from each zone. The study was conducted as a computer assisted telephone interview (CATI) with top managers (almost 40% respondents were CEOs, members of board, owners or co-owners). On a scale from 1 to 5 (1 – very poor, 5 – very good) investors assessed "their" zones:

2.1) overall performance;

2.2) infrastructure (e.g. roads and motorways, railway connections, technical infrastructure);

2.3) business environment (e.g. distance to logistics centres, suppliers, availability of additional - e.g. legal and financial - services);

2.4) cooperation with SEZ authorities (services provided by SEZ to support enterprises within the zone, quality of services offered to investors);

2.5) human resources (quality and availability of labour in the zone and in its vicinity).

We need to stress that opinions come from all investors, domestic and foreign, but since the latter represent 80% of investors' outlays, potential distortion of obtained results is probably statistically minor.

The third group of variables includes determinants of investment attractiveness of voivodeships. They were taken from annual rankings of the Gdansk Institute for Market Economics (Polish abbr. IBnGR) over the period 2005-2014 (Nowicki ed., 2014). Average ranks from the last 10 years allowed us to offset the effect of outliers in the sample. In order to evaluate investment attractiveness of Polish voivodeships, IBnGR considered several dozen factors, out of which it then created 7 variables (partial rankings) and 1 overall ranking. We took the following variables:

3.1) overall ranking;

3.2) market absorption, including the size of the market, household affluence and investment outlays of enterprises;

3.3) labour resources and costs, including the size of working population and the number of unemployed, vacancies, migration of secondary school and university graduates, salaries and wages;

3.4) transport accessibility, including the location of a voivodeship vis-à-vis the Western border, capital city, other regional centres, international airports and big sea harbours;

3.5) economic infrastructure, including the density of business environment institutions, presence of R&D centres, fairs, exhibitions, and special economic zones[15];

3.6) social infrastructure, including the number and activities of cultural institutions, saturation with hotels and catering establishments;

3.7) general safety, including crime rates and structure and crime detection rates;

3.8) involvement with investors at the level of voivodeship, including the number of investment offers in the database of the Polish Information and Foreign Investment Agency (Polish abbr. PAIiIZ). PAIiIZ certification results of Regional Investor Service Centres information and promotion activities vis-à-vis investors delivered with the support of Trade and Promotion Sections at Embassies of the Republic of Poland (Polish abbr. WPHiI).

All of the above-mentioned variables were compared against cumulated inflow of foreign investment into SEZ in terms of value (in PLN) and quantity (number of valid permits as an approximate measure of investment projects[16]). We used data from counties processed for our study by the Department of Support Instruments at the Ministry of Economy in 2015 (as at 31 December 2014).

4. Correlation analysis and discussion

In the first part of our study we used Pearson correlation coefficient, Spearman's rank correlation coefficient (Rószkiewicz, 2002; Sobczyk, 2000)[17] and the SPSS software for calculations.

Table 2

Determinants of FDI value in SEZ (as at 31.12.2014)

No. of variable	Determinants	Pearson		Spearman	
		Coefficient value	Empirical significance level (p – value)	Coefficient value	Empirical significance level (p – value)
		Cumulated value of foreign investment in SEZ			
	1. Intra-zone				
1.1	Size of the zone in ha	0.890	0.000	0.842	0.000
1.2	Cumulated promotion outlays of ZMCs	0.665	0.010	0.609	0.021
1.3	Tax allowances for ZMCs	0.642	0.013	0.578	0.030
1.4	Equity of ZMCs	-0.006	0.985	0.092	0.753
1.5	Number of towns and cities with sub-zones	0.756	0.002	0.802	0.001
1.6	Number of municipalities with sub-zones	0.497	0.071	0.630	0.016
1.7	State aid granted to operators in the SEZs*	0.952	0.000	0.864	0.000
1.8	Costs of construction and modernisation of zone infrastructure*	0.707	0.050	0.732	0.030
1.9	Percentage of zone area allocated to investors	-0.028	0.923	-0.108	0.714
1.10	Infrastructure outlays of ZMCs, cumulative	0.246	0.397	0.534	0.049

[15] In strict terms, IBnGR ranking includes available areas and investors' activities in SEZ.

[16] Usually there are slightly more valid permits than actual investment projects.

[17] They take values from closed interval [-1, +1]. The relationship we study is the stronger the closer the coefficient is to the ends of the interval. The sign informs about the convergent (positive) or divergent (negative) profile of the relationship. Pearson coefficient is the most popular measure of correlation between ratio variables, which informs about the strength of the close-to-linear relationship between the value of variables. Spearman coefficient shows correlation between rankings (ranks) of values of variables (in ascending or descending order). Differently from Pearson coefficient, it measures any monotonic, not only linear, dependence between variables; it is also more robust and resistant to outliers in the sample.

	2. Investors' assessment of SEZ				
2.1	Overall assessment	0.541	0.046	0.569	0.034
2.2	Infrastructure	0.699	0.005	0.749	0.002
2.3	Business environment	0.657	0.011	0.669	0.009
2.4	Cooperation with SEZ authorities	0.491	0.075	0.525	0.054
2.5	Human resources	0.455	0.102	0.429	0.126
	3. Investment attractiveness of voivodeships				
3.1	Overall investment attractiveness	0.573	0.032	0.440	0.115
3.2	Market	0.568	0.034	0.348	0.223
3.3	Labour resources and costs	0.593	0.025	0.559	0.038
3.4	Transport accessibility	0.346	0.226	0.128	0.664
3.5	Economic infrastructure	0.456	0.101	0.370	0.193
3.6	Social infrastructure	0.442	0.114	0.352	0.217
3.7	Public safety	-0.430	0.125	-0.515	0.06
3.8	Activities addressed to investors	0.348	0.223	0.326	0.256

*As at 31.12.2012
Source: own elaboration.

Table3

Determinants of FDI population in SEZ (as at 31.12.2014)

No. of variable	Determinants	Pearson		Spearman	
		Coefficient value	Empirical significance level (p – value)	Coefficient value	Empirical significance level (p – value)
		Cumulated population of FDI in SEZ (no. of valid permits)			
	1. Intra-zone				
1.1	Size of the zone in ha	0.897	0.000	0.868	0.000
1.2	Cumulated promotion outlays of ZMCs	0.785	0.001	0.754	0.002
1.3	Tax allowances for ZMCs	0.664	0.010	0.705	0.005
1.4	Equity of ZMCs	0.008	0.978	-0.141	0.631
1.5	Number of towns and cities with sub-zones	0.718	0.004	0.682	0.007
1.6	Number of municipalities with sub-zones	0.637	0.014	0.754	0.002
1.7	State aid granted to operators in the SEZs*	0.933	0.000	0.864	0.000
1.8	Costs of construction and modernisation of zone infrastructure*	0.728	0.03	0.679	0.08
1.9	Percentage of zone area allocated to investors	0.018	0.951	-0.191	0.513
1.10	Infrastructure outlays of ZMCs, cumulative	0.208	0.475	0.613	0.020
	2. Investors' assessment of SEZ				
2.1	Overall assessment	0.603	0.022	0.670	0.009
2.2	Infrastructure	0.843	0.000	0.908	0.000
2.3	Business environment	0.800	0.001	0.854	0.000
2.4	Cooperation with SEZ authorities	0.614	0.020	0.710	0.004
2.5	Human resources	0.502	0.067	0.503	0.067
	3. Investment attractiveness of voivodeships				
3.1	Overall investment attractiveness	0.578	0.031	0.475	0.086
3.2	Market	0.556	0.039	0.317	0.270
3.3	Labour resources and costs	0.649	0.012	0.629	0.016
3.4	Transport accessibility	0.453	0.103	0.414	0.142
3.5	Economic infrastructure	0.433	0.122	0.405	0.151
3.6	Social infrastructure	0.442	0.114	0.317	0.270
3.7	Public safety	-0.402	0.154	-0.493	0.073
3.8	Activities addressed to investors	0.275	0.342	0.273	0.345

* As at 31.12.2012
Source: own elaboration

Firstly, obtained results (Table 2 and 3) demonstrate differences in the impact of each of the three distinguished groups of factors upon FDI inflow into SEZ. This finding may be relevant for government policy towards the zones. Relatively the biggest role was played by intra-zone determinants, while exogenous factors, i.e., economic development of voivodeships where the zones are located were the least important. It may suggest that zones located in less competitive regions of Poland may also attract foreign investors if they are more active and have more resources for infrastructure-related projects.

Secondly, in quantitative terms and value-wise the results in most cases are rather similar. However, among intra-zone factors attention is drawn to much higher correlation and empirical significance coefficients obtained for the relationship between the number of municipalities and investment projects than for the relationship between the number of municipalities and the value of investment. This should be attributed to higher dispersion of investment projects and the need to adjust the location of plots to the needs of small and medium-sized operators. Clearly, higher correlation between the assessment of SEZ performance by investors and FDI population rather than the value suggests that zones are perceived better by those who invest in smaller undertakings.

Thirdly, in most cases dependencies were consistent with our expectations. Among factors the most correlated with FDI inflow we should list the intra-zone ones, such as the size, promotion outlays of ZMCs, tax allowances for companies, number of towns and municipalities subject to zone-related regulations (only Spearman's coefficient), amount of State aid[18] and costs of provision and modernisation of infrastructure in the zones. The latter was crucial in investors' assessment together with the quality of business environment or cooperation with local administration, mainly self-governments. It means the success of zones depends not only on the support available within them but also on the commitment and professional approach of local officials.

Fourthly, rather surprisingly, most dependencies between FDI inflow into SEZs and factors of investment attractiveness of voivodeships turned out to be insignificant. Labour costs and resources as well as the size of regional market were the only exception. Negative structural parameter for public safety and its significance level slightly exceeding 0.05 suggest public safety was disregarded by foreign investors.

5. Regression analysis and discussion

Correlation methods were used to identify the strength of relationship between the inflow of FDI and a series of factors. The second part of the study was designed to specify the regression function, which identifies foreign investment in SEZs depending on the value of explanatory variables. To this end, for regression equations we selected the same two dependent variables that were used in correlation analysis:

a) cumulated FDI inflow into SEZ in value terms (in millions of PLN) as at the end of 2014;

b) and cumulated FDI inflow into SEZ in quantitative terms (valid permits) as at the end of 2014.

Likewise, explanatory variables were variables used in statistical part. Equations included two explanatory variables each, with no constant term, which turned out to be insignificant:

$y = b_1 x_1 + b_2 x_2,$

where: y – explained variable;

x_1, x_2 – explanatory variables;

b_1, b_2 – structural parameters.

[18] High dependence may partly be due to the fact that the granted aid is always a derivative of invested amounts. However, in accordance with the EU rules, maximum State aid intensity depends on the level of economic development of a voivodeship.

Due to limited number of observations (14), we did not use more variables. The model was simple and its equations were separate entities in their own rights. Overall, several dozen varieties of equations were estimated with explanatory variables from the same or different groups[19], in accordance with the classification adopted in correlation analysis. Following formal and substantive validation, we selected 10 equations. Using the SPSS software, we calculated structural parameters and stochastic structure parameters of the model.

Table 4

Regression equations estimates

No.	Dependent variable*	Explanatory variables (predictors)*	Structural parameters	R^2	Empirical significance (p- value)	Durbin – Watson statistic**	Beta	Multicollinearity tolerance	Multicollinearity - VIF
1.	y_1	x_1 x_2	685.2 170.5	0.823	0.015 0.030	2.215	0.520 0.451	0.443	2.260
2.	y_2	x_1 x_2	9,369 1,725	0.926	0.000 0.005	1.833	0.625 0.401	0.443	2.260
3.	y_1	x_3 x_4	1597 7458	0,733	0,001 0.032	1.894	0.708 0.368	0.966	1.035
4.	y_2	x_3 x_4	20.19 80.08	0.838	0.000 0.012	2.175	0.786 0.347	0.966	1.035
5.	y_1	x_5 x_6	2949 6749	0.744	0.001 0.050	2.503	0.690 0.337	0.891	1.123
6.	y_2	x_5 x_6	3.860 63.158	0.851	0.000 0.037	2.513	0.793 0.277	0.891	1.123
7.	y_1	x_6 x_7	5501 475.1	0.851	0.045 0.000	2.565	0.275 0.798	0.863	1.159
8.	y_2	x_6 x_7	53.72 5.655	0.871	0.056 0.000	2.441	0.236 0.820	0.863	1.159
9.	y_1	x_6 x_3	7294 1502	0.722	0.041 0.001	2.250	0.364 0.666	0.909	1.100
10.	y_2	x_6 x_3	70.9 19.4	0.810	0.036 0.000	2.321	0.311 0.756	0.909	1.100

*Symbols in columns1 and 2:
y_1 - cumulated value of FDI in SEZ (as at 31.12.2014)
y_2 - cumulated number of FDI projects in SEZ (as at 31.12.2014)
x_1 – promotion outlays of SEZ managing companies (1.2 in Table 2)
x_2 – tax allowances for SEZ managing companies (1.3 in Table 2)
x_3 – infrastructure (2.2 in Table 2)
x_4 - labour resources and costs (3.3 in Table 2)
x_5 – municipalities in SEZ (1.6 in Table 2)
x_6 - overall investment attractiveness (3.1 in Table 2)
x_7 - towns and cities in SEZ (1.5 in Table 2)
** Critical values of Durbin – Watson test for: $p = 0.05$, $k = 2$, $n = 14$ amount to - $d_l = 0.91$, $d_g = 1.55$
Source: own elaboration.

These equations very well explain the differences in investment inflow into SEZs. The model fits empirical data relatively well. Determination coefficient takes values from 0.722 to 0.926. Estimates of structural parameters are significant at 0.01 or 0.05. There were no problems with multicollinearity. Durbin-Watson test shows no auto-correlation in seven cases and is inconclusive in three cases. It means no relevant explanatory variable has been found missing in equations.

Obtained estimates explain the role of factors from all the three groups in FDI inflow. In the first two equations only two intra-zone factors were used as explanatory variables: promotion outlays of ZMCs and cumulated tax allowances, which in quantitative terms resulted in the model the best fitted to empirical data (R^2=0.926). Strong total impact of the two above variables confirms results from the statistical part of the study and suggests high correlation between FDI inflow and intra-zone factors. However, the foregoing is true only for two variables from Group I whose impact on FDI

[19] Group I – intra-zone factors, Group II – investors' assessment (reputation), Group III – determinants of investment attractiveness of voivodeships.

projects is complementary. It means FDI can be attracted to SEZs by more intense promotional campaigns of ZMCs, for which they need resources from tax allowances granted by the government.

There are other relevant relationships with explanatory variables coming from different groups, although in these instances models usually did not fit empirical data equally well as in the case of two explanatory variables from Group I. In such "cross" equations exogenous factor "overall investment attractiveness" was the most frequent (three times) explanatory variable. It produced good estimates in connection with investors' assessment of infrastructure and SEZ concentration measured with the number of towns and municipalities, in which it owns plots. That suggests FDI inflow is bigger when a zone has many sub-zones with good infrastructure in regions attractive to investors.

It is noteworthy, when the model with the variable representing investors' opinions about infrastructure was expanded with the second explanatory variable (labour resources and costs or overall investment attractiveness), parameters fitted the two endogenous variables very well. However, the variable representing the condition of infrastructure in voivodeships (by their attractiveness ranking) was insignificant from the point of view of correlation and we failed in constructing a regression equation that would include this very variable at adequate levels of stochastic structure parameters of the model. It may mean that investors find infrastructure in the zone and its vicinity much more important than infrastructure in the voivodeship which perhaps, meets their expectations.

Conclusions

In Poland SEZs are designed to prevent discrepancies in regional development, on the one hand, but, on the other hand they are also expected to contribute to the overall growth of the economy. To obtain subsidies (the most important are exemptions in CIT) an investor has to fulfil certain conditions, which can be a barrier of entry into SEZs. As their area is delineated in legal, not in physical sense, they have got dispersed across all regions, rich and poor, in order to satisfy the needs of particular investors. However, establishing SEZs in better developed parts of Poland may not contribute to the narrowing of development gap between regions.

Foreign firms are responsible for 81% of investment stock, 72% of new jobs and 50% of investment projects in SEZs. They played a major role in developing zones close to the Western and Southern borders. The further East we go, the smaller their interest in zones despite usually higher state aid ceilings.

We considered the following determinants of SEZ attractiveness to foreign investors: (1) intra-zone factors; (2) current investors' opinions (zone reputation); (3) investment attractiveness of voivodeships where a zone had its plots. Correlation analysis demonstrated, generally, that the three distinguished groups of factors have different impact on FDI inflow. What is more, the zones are perceived better by those who invest in smaller undertakings. As far as details are concerned, we found that:

- the intra-zone factors were crucial. First and foremost they include the size of the zone, number of towns and municipalities in sub-zones, State aid for investors and costs of the provision and modernisation of infrastructure in the zones, as well as tax allowances granted to the ZMCs and their outlays for promoting the zone;
- good zone reputation was of secondary importance. It depended first of all on the quality of zone infrastructure, the quality of business environment and investors' cooperation with local administration, mainly territorial self-governments;
- rather surprisingly, overall investment attractiveness of voivodeships was the least important determinant. The only significant variables were labour availability and its cost, as well as market potential in the regions.

The results of correlation analysis were in several aspects confirmed by regression analysis. It showed that SEZs are more interesting to foreign investors if the promotional campaigns of ZMCs are more intense, if they have more resources for improving the zone operation, and if the zones consist of numerous sub-zones with good infrastructure.

Summing up, our study's final conclusion is rather optimistic: zones located in less developed regions of Poland are not in a totally hopeless position when competing for foreign capital with their counterparts in more developed parts of the country. A lot depends on the ZMC, resources left to its disposal by the State and on its ability to cooperate with local authorities in order to create a business friendly atmosphere.

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CONSIDERATIONS RELATING THE ITALIAN E-COMMERCE DEVELOPMENT IN A GLOBAL ECONOMY

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Abstract. The electronic commerce or e-commerce is an important instrument of the New Economy because, thanks to the use of the electronic network, revolutionizes the traditional patterns of trade by allowing companies to improve the efficiency and quality of its services with a considerable reduction in costs. In the '90s with the creation of Business-to-Business (B2B) electronic commerce designed for companies and Business to Consumer (B2C) electronic commerce between companies and consumers is recording, in recent years, a growing interest of entrepreneurs in the new mechanism and technologies, of the New Economy for their companies in the new market. Italy, backward in terms of IT infrastructure, is proving to want transposing the boost that the e-economy is giving to the world economy by starting at various levels, the e-commerce machine.

In the paper, we analyze the evolution and the incidence of the new model of commerce in the developed countries and in developing countries. The research methodology uses data from the market research carried out by public institutions, companies and Italian and international research organizations highlighting economic and social quantifying. Key findings highlight how the big companies have gained huge market shares compared to medium and small businesses exploiting their size in an international competition determined by insufficient regulation of the global economy as evidenced by a growing number of economists.

Key words: *e-commerce development, e-commerce in Italy, globalization, market risks, new economy*

JEL code: L81, M21, O57

Introduction

Electronic commerce or e-commerce is considered the forerunner of the New Economy because, thanks to the use of the network, revolutionizes the traditional patterns of trade by allowing companies to improve the efficiency and quality of its services with a significant cost reductions. In the '90s with the creation of Business-to-Business (B2B) electronic commerce designed for companies and Business to Consumer (B2C) electronic commerce between companies and consumers is recording, in recent years, a growing interest of entrepreneurs for their companies in the new market. Italy, backward in terms of infrastructure, in the last years is proving to want transposing the boost the e-economy is giving to the world economy to recover the accumulated delay (Vietri, D. & Cappellotto, G., 2011).

With the new ICT (Information and Communication Technology), there is the transition from mass society to digital society. The first one based on the production of standardized physical goods aimed at a homogeneous market and the second one based on the production of information and knowledge through the Internet spread rapidly, profoundly changing the world of production, trade, human relations, research, etc. The ICT make digital society based on a continuous flow of information on the custom sales on the relationship with the client.

Companies that sell products or services on the internet to be successful must achieve credibility and visibility. Meanwhile, creating a website for their customers, having a secure enough server, and transmitting a positive experience

as reputation, image and identity of successful enterprise. Therefore, it is important that the e-commerce website has easy and quick response, is legible, allows to correct errors and the refusal of goods because of the customer dissatisfaction without payment of penalties.

The EU Commission Communication 97/157 defines e-commerce is defined as "carrying out commercial activities and transactions electronically and includes various activities such as the marketing of goods and services electronically, the online distribution of digital content, the making of electronic financial transactions and stock market, public procurement electronic and other types of settlement agreement procedures of the Public Administration".

Moreover, e-commerce is as a set of business transactions between the producer (supply) and consumer (demand), made with the use of computers and computer networks, and for the exchange of information directly related to the sale of goods and services (Valter, N., et al., 2016). The e-commerce identifies the purchase, sale, order and payment in electronic form of products, using a network infrastructure. Internet, essentially, has transformed electronic commerce from simple data exchange between companies in a real commercial business, in which the web sites function as virtual stores cancelling the distance between the producer company and the final consumer (Peters, M.A. & Besley, T., 2016). Electronic commerce can be in an indirect form when combines to the order and electronic payment of the purchased products their delivery to the buyer through the traditional routes. Conversely, in a direct form are treating and end entirely, the business networked, such as the order, payment, and delivery of products or services in digital online format. In addition, we must also consider the sales of products made through traditional channels stimulated, however, by the Internet through the advertising and marketing networked (The Boston Consulting Group, 2011).

The advantages can be identified, both for the users: the virtual market on the Web allows the consumer access to goods and services without any geographical and temporal constraints; possibility of access to a wide and diverse choice both as regards the characteristics of products and the price; is possible to find details, specialized products, amateur, using search engines. As for the companies: large new market of potential customers to lower infrastructure costs; a direct and interactive communication with the consumer and thus the production of on-demand assets; simplified collection of sales data required for marketing; international exposure; abbreviation of the supply chain; reduction of operating costs (Becerra-Alonso, D. et al., 2016).

For the company the e-commerce represents a sales alternative channel, compared to the traditional one, which defined in general terms, as "any type of transaction tends to sell or buy a product or a service, in which actors interact electronically rather than by physical exchanges and direct contacts".

The company, taking advantage of e-commerce, can reach potential customers, anywhere in the world and, then facilitates the fall of the protective barriers of the geographical distance (Nica, E., 2016).

Web sites where customers make their purchases called e-shops or virtual shops so, as to distinguish them from the traditional ones. The meaning of the term "electronic commerce" has changed over time. Tools as Electronic Data Interchange (EDI) used as a support to business transactions in electronic form, to send commercial documents, like purchase order or invoice in electronic format (Lăzăroiu, G., 2016). Then, we switched to functions referred to more accurately as: e-commerce, purchasing goods and services through the World Wide Web, using more secure servers (HTTPS) where they are used electronic shopping carts and online payment services, such as authorizations for payment by credit card. In fact, the EDI was not an interactive system that allowed trading and was not a global network supported by telecommunications networks with excessively high costs.

However, consumers have accepted the e-commerce business model less readily than what its proponents have had expected (Androniceanu A. & Drăgulănescu, I.V., 2016). Several reasons could justify the slow diffusion: a) doubts about security; b) the issue of access to networked trade, for poor families and nations in developing; c) the poor diffusion of Internet services that reduces the potential of the e-commerce; d) the social aspect of shopping (Ghislandi, R., 2012).

Thee-commerce can be different due to the environment in which takes place the commercial activity, and of the players involved and can be divided into four categories having different characteristics:

1) Business to Business: commercial transactions between companies;

2) Business to Consumer: commercial transactions made between the company and the final consumer;

3) Business to Administration: regards all transactions that can be carried out between business and public administration;

4) Consumer to Administration: transactions between citizens and public administration, still not very developed.

1. Methodology

In this paper, we performed a quantitative analysis regarding the electronic commerce in Italy. This analysis was conducted through an on-line survey and in-depth interviews with some of the major market players. The companies involved were more than 3,000, and over 400 have actively contributed to filling in the questionnaire or by interview. Participants were company owners, managing directors, general managers, marketing managers, country managers, e-commerce and Internet managers. The companies surveyed are Italian or Italian subsidiaries of multinational groups. All data presented refer to the Italian business to consumer e-commerce market.

Also using specific Excel functions and the trend line calculation we find out the online sales estimation for the next three years. We used for estimation the linear function that precisely approximates the previous sales (R^2= 0.9754) and the relative error calculated is around 5%. The results target an estimation of sales for the next 3 years, up to 2019 (Tab.1, Fig.1).

2. Evolution and business volume of e-commerce in the world

In 1995, the total number of Internet users was less than 1% of the world population, and in 2016, it reached 3.4 billion (around 46% of the world population Internet has grown exponentially globally and it is estimated that the level of traffic generated in 2017 will be greater than the sum of previous years. (Business International, 2012; ecommerce wiki, 2016). The market value of the global retail e-commerce estimated in 2016 at 1.915 billion dollars, 200 billion dollars more than in 2015, amounting to 8.7% of the total retail market (7.4 % in 2015) (Twenga Solutions, 2016). As the growth rate for retail sales is falling overall, the digital share continues to expand rapidly, with a growth rate of 23.7% in 2016.The e-commerce sales will reach 4.058 billion dollars in 2020 and will come to cover 14.6% of total spending. The e-commerce sales will reach 4.058 billion dollars in 2020 and will come to cover 14.6% of total spending.

Two countries continue to dominate the world rankings and are China and the United States. In first position is China with a turnover of online sales in 2016 estimated at 899.09 billion dollars, almost half (46%) of the global market. Second place is the United States with a turnover of 423.34 billion dollars in 2016 and a growth of 15.6% over 2015. The Asia-Pacific area is set to remain the largest e-commerce market globally, with a turnover of over one million dollars in 2016, up by (+ 31%) and a more than double (2,725 billion dollars) by 2020. In Southeast Asia, in particular, e-commerce still represents only a fraction of retail sales with little infrastructure and digital payments developed. A weak logistic system makes these markets unprepared to handle high volumes of online orders and, consequently, the e-commerce market is at an early stage (Androniceanu, A. & Drăgulănescu, I.V., 2016). Overall, the growth of online retail sales in 2016 exceeded 10% in most markets, even in more developed countries like US, UK and Germany, and a significantly higher growth in emerging markets. The value of e-commerce in Europe is estimated in 2016 to 509.09 billion euro; an increase of 13% compared to 2015.It is estimated that about 296 million people make online purchases from 48 European countries,

including 28 European Union members (Popescu, G.H., 2016). Today, 57% of European Internet users make online purchases, but only 16% of SMEs sell online, and less than half of them (7.5%) sell online across borders. In 2017 the online forecast sales of goods and services are of 598 billion euro, while in 2018 is expected to total turnover of 660 billion euro. The three countries with the highest e-commerce sales are, once again, United Kingdom, Germany and France, accounting for about 60% of the European e-commerce market (European b2c e-commerce Report, 2016). In the UK, b2c ecommerce sales grew by nearly 16% in 2016, going from 175.74 billion dollars in 2015 to 203.26 billion dollars in 2016. We observe that among the European growing countries, in Romania the value of the e-commerce market is estimated at 1.8 billion Euros in 2016, thus an increase of 30% over 2015.Romanian consumers have averaged 8.4online shopping per head in 2016. The data refer only to the sale of products.

The regulatory aspects continue to play an important role in the evolution of the European e-commerce market and, in particular, in international sales. The European Commission, having established in 2015 the application of VAT in the country of purchase for the sale of digital products and services, in January 2017, introduced a new measure mainly aims to strengthen security and data protection. The adoption of the Directive (revised payment service directive or psd2), whose entry into force is planned for 2018, laid the foundations for a banking sector opened in Europe, with standardized access to banking infrastructure and customer data. The psd2 will radically change in the payments value chain, business models deemed profitable and customer expectations. This directive also aims to stimulate innovation, strengthen consumer protection and improve payment security over the internet.

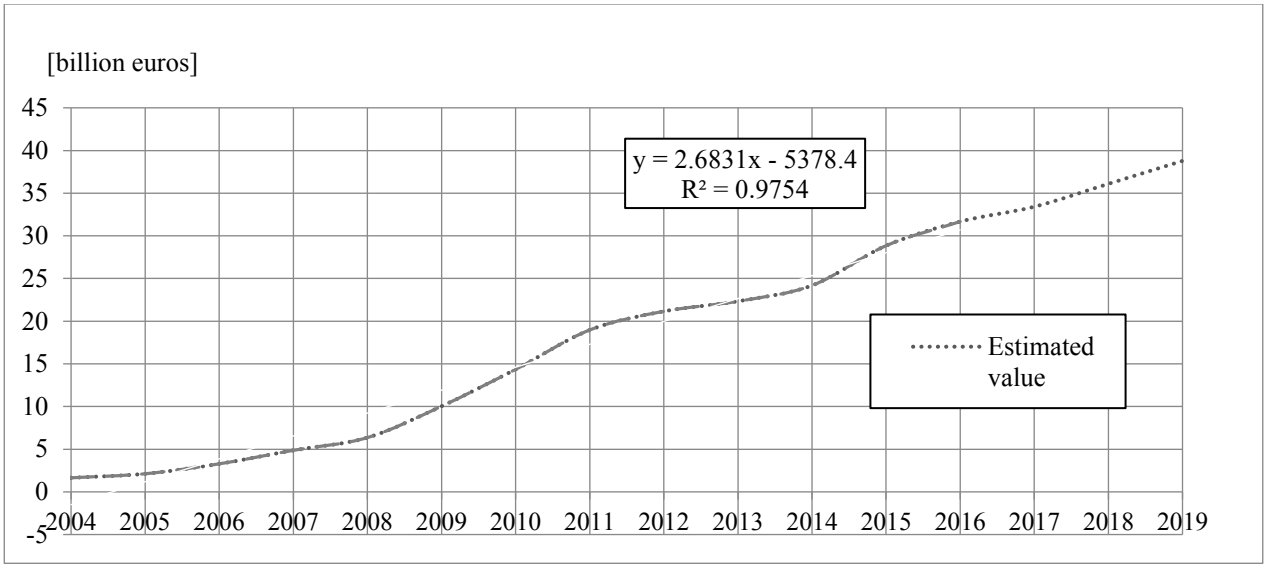
In Italy, the spread of online has reached 88.7% of the population aged from 11 to 74 years, with 42.6 million Italians who claim to be able to access the internet, an increase of 2.8% in 2016 compared to 2015. The b2c e-commerce market in Italy generated a turnover of 31.7 billion Euros in 2016, increasing by 10% compared to 2015 (Table 1). The e-commerce turnover showed positive results in all sectors, and overall growth was lower, however, compared to 2015. In addition, the online sales estimation for the next three years continues the positive trend.

Table 1

Turnover evolution of the e-commerce in Italy

Year	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Turnover (billion euros)	1,645	2,123	3,286	4,868	6,364	10,037	14,357	18,97	21,154	22,337	24,188	28,85	31,671			
Estimated value		1,2155	3,8986	6,5817	9,2648	11,9479	14,631	17,3141	19,9972	22,6803	25,3634	28,0465	30,7296	*33,4127*	*36,0958*	*38,7789*
Relative error		0,4274611	-0,1864273	-0,3520337	-0,455814	-0,1903856	-0,0190848	0,0872905	0,0546847	-0,0153691	-0,0485943	0,027851	0,0297244			
Average error		-0,053391426														

Source: author's calculations based on CasaleggioAssociati, 2017



Source: author's calculations based on CasaleggioAssociati, 2017

Fig. 1. **Turnover evolution of the e-commerce and relative error, up to 2019**

Therefore, the e-commerce growth remains in double digits in 2016. The Italian e-commerce is entering a phase of maturity and consolidation. Many actors who have taken the lead in the richer sectors are speeding up the pace, breaking the competition. One factor that is emerging more and more clearly is the fact that e-commerce is a capital-intensive sector.

3. Turnover distribution of e-commerce in 2016

Within distribution of e-commerce turnover, the leisure and tourism sectors continue to represent the largest share of the market, coming together to generate 74% of e-commerce turnover. The percentage of turnover generated by the leisure sector (43%) is, however, slightly down compared to 2015, when it reached 47% but, however, an increase in absolute value. The sectors that grew most in terms of turnover were health and beauty (+ 36%) and food (33%) compared to 2015. The growth of online shopping centers continues, where the dominance of the major international players, the fashion industry, with the largest operators that grow quickly and the house and the furniture industry. The online turnover of these sectors (Table 2) is, however, still modest in absolute terms and in proportion to the other sectors. Tourism, which is one of the most mature sectors, grew by about 12%.In this sector, the sharing economy has opened new markets that have yet to stabilize.

Table 2

Turnover distribution in 2016

E-commerce turnover of 31,6 billion Euros in 2016										
Leisure time			Tourism	Shopping Centres	Insurance	Electronics	Food products	Publishing	Fashion	Home and decor	Health and beauty
43%			31%	10%	6%	2.9%	2.4%	2%	1.9%	0.5%	0.3%
Online game (replayed amounts)	Online game (spending)	Other Leisure time									
35%	3.5%	4.5%									

Source: author's calculations based on CasaleggioAssociati, 2017

4. Italian digital consumers

According to the *E-commerce B2C Observatory* (School of Management of Milan Polytechnic and Netcomm) the purchase of products through the web has seen a growth of 18% compared to the 2015 data. Comparing it with purchasing habits of other European countries shows, that e-commerce in Italy has not yet reached such a large market share. In fact, *E-commerce Report 2016* of the BEM Research set to 3.6% share of the online commerce in Italy compared to a total value of purchases made by Italian families of 12% of the European market. The margins for growth are therefore very large, but for move consciously is necessary to know, interpret and understand who really the Italian digital consumers are.

The Italian digital market have frequent consumers (DAG, 2013; Audiweb, 2015), there is that who buy one or more times per month (51.4%), then the regulars who purchase one or more times per quarter (33.5%), the intensives they buy one or more times per week (28.6%) and finally the occasional consumers who buy one or two times per year (4.2%). The percentage of the person making an average of one purchase per month is equal to 81% in Italy. Within these four categories, emerge the first differences of gender and country of origin: the number of men who buy online one or several times per week, for example, it is greater than that of women (respectively 31.1% and 24, 9%). From the geographical point of view, we note some interesting correlations between frequency of purchases and size of the urban centers. The resident area is largest, the greater will be the concentration of intensive buyers, and instead in centers with less than 10 thousand inhabitants, we find the highest number of occasional buyers.

As for the age, we note that the e-commerce phenomenon in Italy does not involve specifically younger people, as perhaps we would expect, the Italian e-consumers with greater propensity to purchase are aged between 35-54 years. Highest number of occasional buyers are in the extreme ranges of the sample, between 18-24 years and over 55. The reasons that push a consumer to choose to buy online are essentially three: lower prices (63%), breadth of choice (37%), ability to make comparisons between prices and products (34%). In addition, other factors related to the comfort are affecting as the ability to save time, to buy at any time, not having to move from home or find more online information and opinions on a product. The price is one of the factors to which Italians digital buyers pay more attention with 94% declaring that compare the prices online and offline.

According to the European Digital Behavior Study 2016 (EDBS16), research on the behaviour of the population in Europe and outside Europe on the internet, made by ContactLab are 30.5 million Italians connected, equal to 78% of people between 16 and 65 years. Also is increasing the number of mobile users also regarding e-commerce. The research measures the user connectivity and compares countries thanks to Digital Interactivity Index. As far as the use of internet, growth was + 6%, the Italian index has reached a value of 39, compared to 51 of Great Britain and 46 in Germany. While, beyond the borders of Europe, the values are even higher: Shanghai (61), New York (55), Moscow, St. Petersburg (53) and Seoul (53).

Although the 87% of Italians who use the internet declares to make online purchases, the role of the physical store remains decisive. This occurs especially in the sector of fresh food, where 38% of Italians affirms that "in store" visits are essential for the formulation of the purchase decision. These figures emerge by the Nielsen Global Connected Commerce Survey, carried out on a sample of 30,000 individuals in 63 countries, including Italy. The e-commerce is reshaping the whole concept of shopping and its variations. Therefore, the purchase must be included in a wider process of internal experience which are traceable value-different. The reference mainly concerns increasingly strong consumer need to request more information concerning what they need to buy than ever before. Nowadays, the borders between the physical and digital are increasingly blurred. For example, it is switching from online reviews of the product, to reading of flyers, word of mouth and, more importantly, to what can be find within the physical store from the sales staff. As shown by research, the current focus of large retailers is to encourage engagement and shopper satisfaction through multiple touch

points during the purchasing path (Table 3).Only in this way can be support and strengthen the propensity to of the customer's consumption, which more and more must be accompanied on the path leading to the product.

Table 3

The online and offline touch points that influence our buying decisions (Basis: Total web users)

Products of wide consumption	touch points offline		Products of wide consumption	touch points online	
	fresh foods (fruits, vegetables, meat and dairy products)	Beauty and Personal Care Products		fresh foods (fruits, vegetables, meat and dairy products)	Beauty and Personal Care Products
	%	%		%	%
physical store	38	31	Websites for coupons or discounts	11	17
flyers	21	17	E-mail business	8	14
Mouth from an acquaintance	18	19	Social media	8	13
shop staff's advice provided	11	20	store's website	7	17
Magazines or newspapers	9	15	Brand Website	6	17
TV or radio	9	16	online reviews written by users	6	16
			Blogs or web sites of special interest	6	12
			online reviews	5	12

Source: author's calculations based on ISTAT data, 2016

5. E-commerce in Italy: fairly little known

Though buying and selling goods and services via the web has become now, a common practice in many countries developed and not, the e-commerce in Italy is still on a very limited scale. As is shown in the Report on e-commerce in 2016 elaborated by BEM Research, the value of e-commerce between businesses and consumers (B2C) is estimated to Italy, according to the related data 2015, approximately 21 billion euro. Compared to the complex of the European market, which reaches a size slightly less than 600 billion Euros, the Italian e-commerce is equal to just 3.6% (table 4), against a share of the consumption of Italian families, carried out through all possible channels of purchase, 12% (Ecommerce Foundation, 2016).

Table4

UE28: B2C e-commerce market - percentage breakdown 2015 - non-financial products and services

UK	41.4%
Rest UE-28	17.7%
Germany	16.9%
Spain	6.7%
France	6.0%
Sweden	4.6%
Italy	3.6%
Holland	3.0%

Source: author's calculations based on BEM Research and Eurostat data

The Report of BEM research was recognized as the use of e-commerce in the country of origin constitute a major driver for domestic companies to look out for digital markets. The relationship between how many individuals in a European country have purchased on the web goods and / or services and the number of online orders received by companies of the same country is positive and statistically significant. Interestingly, the link between supply and demand is more relevant to large companies than small-medium ones. This look like to indicate that the companies of larger size tend to take into consideration the web especially if stimulated by domestic demand. However, the smaller size companies probably appreciate the Internet, as sales channel that allows them to increase the turnover beyond the domestic market, thus potentially abroad. The poor propensity of Italian families to purchase online has, therefore, effects on businesses that are reluctant, to present themselves on digital markets.

The Report shows that in markets where this form of sale is more widespread, the companies are larger and hire and invest more; workers are more productive and earn more. So the whole system resulting advantaged. Thanks to higher income, families can consume more; the highest labor costs does not affect the international competitiveness, as productivity is a compensatory factor.

In Italy, in the years 2014-2017, it expects a growth of e-commerce by more than 62%, exceeding the 10 billion euro. In Europe, the rise of online shopping correspond to a decrease of 1.5% in store sales. Reverse is speech regarding Italy: grow both online and offline sells and the stores have sold 0.4% more than in 2015. The e-commerce knows no crisis in Italy, and is likely to increase. Even shopping through smartphones is growing. The study underlines the importance of adopting a multi-channel sales strategy, an evergreen for any brand.

The Observatory B2C e-commerce of the School of Management of Polytechnic of Milano and Netcomm has presented the report "B2C eCommerce in Italy: graduation exam for the offer". "The 2016 was the most important year for e-Commerce because, have become established new business models, driven by the cross concept. Cross border, cross channel and cross device: these are the new terms of e-commerce, showing the evolution based on new ways of shopper behavior. Buyers purchase from Italian and foreign sites, compare products both in the physical channel, and in the digital and make it through smartphones and PCs. The digital export is an opportunity that Italy fails to grasp, because of the small size of the own enterprises that fail to attack foreign markets". This result satisfies partially, because even in 2016 Italy fails to improve its position over its main comparable foreign markets (UK, France and Germany), where e-commerce penetration reaches from two to four times higher. In this scenario, the offer is called to a graduation exam.

The Dot Com have walked this path and, continue to grow more than the traditional business (+ 28% vs. + 10). Traditional operators now have to get involved and trying to innovate while leveraging on assets that distinguish them: significant customer base, wealth of information about their buying habits, sales outlets in the area, and extremely thorough knowledge of the market and products". For products, also play an important role, sites with business models

that focus on the time of purchase (flash sales), and sites which have invested to provide simple and effective customer experience over this channel, such as the marketplace. Instead, for services it is mainly the purchase of transport tickets (rail and air) and accommodation booking.

6. Marketing and online promotion

Online brand promotion continues to be a critical task for most Italian e-commerce companies. In fact, companies that declare such a difficult business are 58% this year (2017), up from 53% in 2016 and 51% in 2015. It also increases the percentage of companies evaluating unsatisfactory online promotion activities (10% compared to 8% in 2016, 10% in 2015. The companies met by online business promotion is 32%, less than a third of the total. They were 39% in 2016 and 2015. Among the marketing activities, the keyword advertising collects the most investment (26%, 29% in 2016), followed by the SEO (Search Engine Optimization) which is allocated 19% of the budget. Social media marketing activities are ranked third with 14% (as in 2016) and email marketing ranked fourth with 13% (12% in 2016) (Table 5).

Table 5

Percentage distribution of marketing and advertising

Acquisition costs of 22,9 euros											
Keyword ADV	SEO	Social media	Email	Comparator sites	Banner	Remarketing	Affiliations	Programmatic ADV	TV/Radio /print	Sponsorships	Other
26%	19%	14%	13%	8%	5%	5%	2%	2%	2%	1%	3%

Source: author's calculations based on CasaleggioAssociati, 2017

The presence on the comparator sites receives 8% of the marketing budget, slightly up from 6% in 2016. Investment in remarketing activity accounts for 5% and 5% is invested in display advertising (banners). The affiliate programs, separated from the banner, receive 2% and the same percentage for programmatic advertising. Television, radio and print collectively account for 2% of investments, down from 6.4% in 2016.

7. Investments in online activities

According to a survey of investments in the short term (2017), Italian e-commerce companies will invest primarily in marketing and promotion, activities identified as priority by 33% of respondents (34% in 2016) (table 6). In second place are positioned, as in 2016, investments aimed at improving the usability and user experience of the site 20%, down from 28% in 2016). On the third place, as indicated by the 13% companies are investing in improving technology infrastructure, which outperforming overseas sales activities (9% of the sample) and mobile (6%) in terms of priorities in 2017.

The three groups of activities listed in 2016 as priorities by 7%, 9% and respectively 10% of the companies. The 6% of companies consider priority to invest in marketing automation and 2% intend to invest in improving logistics services (5% in 2016), and customer care (1%, compared to 2% in 2016). Back to rise, after a few years, the percentage of companies that do not make investments in the current year: 6% compared to 2% in 2016 and 3% in 2015.

Table 6

Short-term investments

Investments in 2017									
Marketing and Promotion	User experience	Technology	Internationalization	Mobile devices	Marketing automation	No investments	Logistics	Customer care	Other
33%	20%	13%	9%	6%	6%	6%	2%	1%	4%

Source: author's calculations based on CasaleggioAssociati, 2017

The theme of corporate financing has become a crucial factor for the competitiveness of Italian companies in the e-commerce sector. However, Italy still far from the support offered in other European countries. The e-commerce companies in Germany, France, UK and Spain receive funding in the hundreds of millions of euro. In Italy, usually not more than 5 million Euros. If this issue is not addressed, the Italian e-commerce will be more and more foreigners. The domain of the leading global players seems ever more unchallenged both at the country level, where in the more mature markets, Amazon continues to erode the market shares of other merchants in all areas and leading to the closure of physical stores. Both at international, where marketplaces such as Amazon, eBay, Alibaba, Tmall and others are placing themselves as the major brokers for merchants who want to sell overseas and for customers who want to shop across borders. The competitiveness of these actors is shifting to the advertising market by countering global tech companies such as Facebook and Google, whereby they can have more customer data, especially with regard to buying behavior. In 2016, Alibaba collected 40% of mobile advertising spending in China, compared to 58% of Google and Facebook in the United States. The next step for Alibaba will be to expand and overtake China's borders by acquiring additional assets around the world.

Conclusions

In 2016, consumers have made at least one purchase online in the year increased by 7% and 19 million (60% of internet users). Among them, the usual buyers who make at least one purchase per month are 12.9 million, generating 91% of total e-commerce demand, and online spending in a year an average of 1.382 Euros.

This user base is much lower than that of the main European e-Commerce markets: UK web shoppers are 48 million (85% of internet users), in Germany 55 million (81% of internet users), France 41 million (76% of internet users).

Interesting is the data on exports defined as the value of sales, from Italian sites to foreign consumers, which in 2016 grew by 17% and more than 3.4 billion euro. The sales network scenario is developing in the logic of *winner takes all*, where few players (if not one) become references of a category leaving to competitors the residual space made of niches, ancillary services, and particular target. The analysis of brand reputation of the Net Retail shows that the first 20 merchants gather 84% of the spontaneous citations of buyers, a lightweight concentration and in steady growth from 2014.The positive side is that if a few sites are becoming icons of online practices, the concentration of sales is down slightly.

In March 2014, 69% of physical products purchases came done using 20% of the most popular merchants, while in June 2015 the concentration dropped to 64%.The trend seems to indicate that the open space of a thousand niches of interests and passions of the buyers and the different service models of merchant is very extensive and constantly growing.

The survey identifies four trends at the base of the evolutionary leap from e-commerce to Net Retail:

1. The innovations of industry: merchant operating in an increasingly sophisticated and effective, new solutions for the delivery and withdrawal of products, online banking and cashless payment systems, in particular the P2P (peer-to-peer or also person-to-person) systems, the proliferation of connected objects and pocket-sized (or wearable).

2. The online penetration into traditional retail fabric: the role of outlets such as online purchasing sites (in store online purchase) or delivery (Pickup Point) with the possibility of geographic profiling combined with the buying behavior.
3. The digital buyer's mind-set, focused on convenience and comfort of purchase, an act that takes place "on my terms"; a very shrewd and discerning buyer, and that online has been accustomed to be served with a lot more about what happens on average in the traditional channel.
4. The values crucial for digital buyer: the online shopping path must always be available, accessible from any device, fast and controllable, staff (self-defined, profiled extent, linked with Social), and rule on the experience of others, in transparent conditions.

Thus, according Giacomo Fusina, CEO of Human Highway, the trends listed above converge in the experience of online shopping aided by Smartphone: more than a new device research and purchase order, the Smartphone is the icon of the new retail, the place where the two worlds (the two channels) of the online and physical environment connect and interconnect. About five million Italians have turned their mobile device into a *purchasing information radar* on which they check their offers, search for and posting comments on products, check availability in real time, and start installing Mobile Payment Systems App. For these people, the difference between online or traditional shopping tends to disappear.

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THE LOST ELEMENT IN EMPLOYEE ENGAGEMENT DEBATE

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Abstract. Within the given paper, Authors intend to answer the question whether a correlation between certain character traits and individual employee's engagement exists. The goal of this paper is to find scientific research based evidence that proves or disapproves such correlation and in case of positive conclusion, to draw the list of specific character traits associated with high engagement that can be successfully used to perform more efficient recruitment for organizations.

Consultants, Researchers and Human Resources Management professionals around the globe are spending enormous time and effort to solve the puzzle of employee engagement. According to research (Gallup, PWC, etc.), both, public and private sector organizations that report higher employee engagement levels, achieve by far better results. Still, despite of all the effort, vast number of sources (Gallup, TNS, Bersin by Deloitte and many others) quote global average engagement level as low as 13%. Organizations spend millions each year on trying to understand secrets for higher employee engagement and on investments in work environment improvements to achieve it, as research quotes as much as 33% higher profitability for companies with engaged employees. According to Josh Bersin, founder of Bersin by Deloitte, more than 120 vendors are now providing pulse survey tools, employee mood monitoring systems, and culture and engagement assessments.

However, one important element in this equation is in most cases forgotten – personality of individual employee. Perhaps, there is little that companies can do to drive engagement, if certain personality traits are missing in their employees? Perhaps, the answer to the ongoing debate around more engaged workforce is not found within what companies can do to raise engagement of their existing workforce. Perhaps, the answer is in what kind of people companies should hire if they care about high engagement levels.

To support the findings from theoretical research, article includes analysis of short survey results, as well as considers possibilities to support and trigger individuals' engagement through a smart use of modern technology.

Key words: Employee Engagement, Personality traits, Human Resource Management

JEL code: M540

Introduction

Rationale behind all the studies related to Employee Engagement is not difficult to define, since numerous authors have proved high impact of engagement not only on business outcomes of enterprises and institutions, but also on individuals themselves. While most research is concerned with the ways how one can improve and increase Employee Engagement from organizational perspective, there's relatively little discussion around individuals and whether there are specific type of people who tend to turn out being more engaged with life in general, including their jobs and whether there's anything that individuals can do to raise their own engagement levels even in circumstances where the organization is not complying with ones expectations fully.

Amy Brann, neuro scientist from UK, in her book Engaged (2015) has said: "Dopamine, serotonin, oxytocin, epinephrine, norephinephrine, and other chemicals all can play their part in helping a person be engaged". This indicates that there are some types of individuals for whom it is easier to get to the state of being engaged with the workplace.

Clearly, engagement is a win-win situation for both employees and their organizations, as K. Royal and K. Sorenson (2015) have found out that engaged employees have higher well-being, healthier lifestyles and better health outcomes than their not engaged and actively disengaged counterparts.

The good news, according to research, are that by taking responsibility and empowering oneself by setting measurable, realistic goals and staying focused on how to achieve those, people have high chance for being successful and engagement is following.

Aim of the Paper

Within the given paper, Authors intend to answer the question whether a correlation between certain character traits and individual employee's engagement exists. The aim of this paper, therefore, is to find scientific research based evidence that proves or disapproves such correlation and in case of positive conclusion, to draw the list of specific character traits associated with high engagement, which can be successfully used to perform more efficient recruitment for organizations. This would help businesses to improve employee engagement through hiring people with higher engagement potential.

Methodology

Authors of the Article have performed literature-based research to identify whether and what connection different authors have identified between specific character traits and life engagement of individuals. In addition, short survey was carried out among MBA students at a Business school to identify the link between work engagement and general life position of individuals.

The basis for all the studies examined in this paper on the influence of character traits to ones engagement to life is Positive psychology – a branch of psychology that rather than focusing on the illnesses of the mind, looks on how to make a life worth living. The Field of positive psychology at the subjective level is about valued subjective experiences: well-being, contentment and satisfaction (in the past), hope and optimism (for the future) and flow and happiness (in the present). The aim of positive psychology is to begin to catalyse a change in the focus of psychology from preoccupation only with repairing the worst things in life to also building positive qualities (Seligman, M., Cszikszentmihalyi. M., 2000).

Before looking on individual studies, one needs to look first at VIA Classification of character strengths and virtues – the basis for all studies reviewed in this paper. In search for correlation between certain character strengths and life engagement, they provide a clear map of positive character strengths. This classification is regarded as the backbone of the science of positive psychology (VIA Institute on Character website. The VIA Classification of Character Strengths and Virtues). The classification was established in a collaboration process

of over 50 scientists led by Martin E. P. Seligman and Christopher Peterson over a period of three years. By examining a long list of candidates, six core virtues were identified in the research (wisdom, courage, humanity, justice, temperance and transcendence) and 24 character strengths assigned to them (VIA Institute on Character website. The VIA Classification of Character Strengths and Virtues). The VIA Classification of all 24 character strengths and an explanations to each of them is defined by N. Park, C. Peterson, M.E.P. Seligman (2004).

Most of the studies used the Satisfaction with Life Scale to measure satisfaction with life, though some other scales were present as well. Satisfaction with Life Scale was developed by Ed Diener, Robert A.Emmons, Randy J.Larsen and Sharon Griffin at University of Illinois. The scale evaluates global life satisfaction (2004).

Research results and discussion

By searching research databases, Authors found various studies examining the relationship between character strengths (shown in Table 1.).

All of these studies as the basis used the VIA Classification of character strengths and virtues proposed by Martin E. P. Seligman and Christopher Peterson.

Table 1.

Studies examined

Number of the study	Authors	Year	Sample size	Sample location
1	Nansook Park, Christopher Peterson and Martin E.P.Seligman	2004	5299	mostly US
2	Satoshi Shimai, Keiko Otake, Nansook Park, Christopher Peterson and Martin E.P. Seligman	2006	1407	US and Japan
3	Nansook Park and Christopher Peterson	2006	680	US
4	Willibald Ruch, Alain Huber, Ursula Beermann, Rene T.Proyer	2007	4419	Austria, Germany, Switzerland
5	Claudia Buschor , René T. Proyer & Willibald Ruch	2013	334	Switzerland
6	Maria L.Martinez-Marti, Wilibald Ruch	2014	945	Switzerland
7	Hadassah Littman-Ovadia and Shiri Lavy	2014	635	Israel
8	13. Azañedo, C, Fernández-Abascal, E, & Barraca	2014	1060	Spain

A total number of 14`779 participants from various countries and age groups participated in these studies. Since most of the studies examined were based on self-evaluation, it is reassuring that among studies was proved that the self and peer ratings converged (Ruch, W., Huber, A., Beermann, U., Proyer, R.T., 2007). Further, in the paper the Authors are briefly going through each of these studies.

Study No.1 - A study by Nansook Park, Christopher Peterson and Martin E.P.Seligman (2004)0 investigated the relationship between various character strengths and life satisfaction among 5299 adults from three Internet samples. The sample was gathered using Internet – Authentic Happiness Website and Values in Action Website. On average the sample was 35-40 years old and most of them (80%) U.S. citizens. As the study proved, consistently and robustly associated with life satisfaction were hope, zest, gratitude, love, and curiosity. Only weakly associated with life satisfaction in contrast were modesty and the intellectual strengths of appreciation of beauty, creativity, judgment, and love of learning.

From 2002 to 2003 a study by Shimai, Otake, Park, Peterson, and Seligman extended previous studies of character strengths and life satisfaction, conducted with English speakers, to Japanese speakers. The study investigated cultural influences on the distribution of character strengths, gender differences in character strengths and the relationship if happiness to character strengths. In total 1407 people were questioned in United States (1099) and Japan (308). Average age was from 18 to 24 years. The study showed that distribution of character strengths by relative rank was quite similar in the two cultures examined. Although this is definitely not the case for all cultures. For example, a study by Robert Biswas-Diener, which examined VIA character strengths in Kenyan Maasai, Inughuit in Northen Greenland and University of Illinois students found differences between and within cultures (Biswas-Diener, 2006). In the study No 2. It was found that gender differences were also similar (with females being higher in kindness, love, gratitude, teamwork and appreciation of beauty and males being higher in open-mindedness, perspective, creativity, bravery, and self-regulation). Thirdly, relationship of the strengths to happiness was also similar (zest, hope, curiosity and gratitude) (Shimai., S., Otake., K., Park., N., Peterson., C., Seligman., M., 2006).0

Study No.3 – a study by Nansook Park and Christopher Peterson examined character strengths and happiness among young children. Total of 680 parents` written descriptions of their children between ages of 3 to 9 years were collected. Love, zest and hope were associated with happiness. Gratitude was associated with happiness only among older children. Overall this study shows similar patterns as in samples of adolescents and adults (Park, N., Peterson, C., 2006).0

A study (Study No.4) made by Willibald Ruch, Alain Huber, Ursula Beermann, and Rene T. Proyer questioned 4419 research participants from Austria, Germany and Switzerland. Research showed that overall similar strengths were predictive of life satisfaction in the three countries with small differences. In all three countries degree of life satisfaction increases with degree of development of the good character (the total score of all strengths). Hope and Zest correlated the most with life satisfaction. This study do not imply causality, the study provides evidence that life satisfaction build upon a well cultivated character (Ruch, W., Huber, A., Beermann, U., Proyer, R.T., 2007). 0

Study No.5 - A study by Claudia Buschor, René T. Proyer & Willibald Ruch raised the question whether the positive relation between character strengths and satisfaction with life found in previous studies can be replicated if peers give the rating. A sample of 334 adults completed a questioner and were rated by total of 634 peers. The study found out that the self and peer ratings converged. Also the strongest correlation between character strengths and life satisfaction was found for hope, zest, curiosity, gratitude and love. Author points out the importance of this study because the character strengths were identified also by other people and therefore were less subjective (Buschor, C., Proyer, R.T., Ruch, W., 2013). 0

Study No.6 - A study by Maria L.Martinez-Marti and Wilibald Ruch is trying to assess the relationship between character strengths and subjective well-being (life satisfaction, positive and negative affect) in a representative sample of German-speaking adults living in Switzerland. Sample of 945 German-speaking adults (459 men, 486 women) of working age, starting from 27 to 57 years living in Switzerland participated in this Study. Hope, zest, love, social intelligence and perseverance yielded the highest positive correlations with life satisfaction. What is important, the study also shed light on the fact that the relative importance of some characteristics over others vary across the life span. In the 27-36 years group, strengths that promote commitment and affiliation (kindness and honesty) were among the first five positions in the ranking if the relationship between strengths and well-being. In the 37-46 years group, in addition to hope, zest and humour strengths that promote the maintenance of areas such as family and work (i.e. love, leadership) were among the first five positions in the ranking. In the 47-57 years group in addition to hope, zest and humour, strengths that facilitate integration and a vital involvement with the environment (gratitude, love of learning) were among the first five positions in the ranking (Martinez-Marti, M., Ruch, W., 2014). 0

Study No.7 - A research executed by Hadassah Littman-Ovadia and Shiri Lavy examined Isreali adults. Total of 635 Hebrew speaking Isreali adults participated in the study. The results replicated previous findings of other studies - Hope, gratitude, vitality, curiosity and love had the highest associations with life satisfaction (Littman-Ovadia, H., Lavy, S., 2014). 0

Study No.8 – A study conducted by Azañedo, C, Fernández-Abascal, E, & Barraca analyzed character strength associations with life satisfaction in Spain. Total of 1060 adults participated in this study. The findings of this study replicated finding from earlier studies. This particular study showed that five character strengths – hope, zest, gratitude, love and curiosity showed very high correlation with satisfaction of life (Azanedo, C., Fernandez-Abascal, E., Barraca, J., 2014). 0

Another interesting set of conclusions have been made by I. Ludviga and A. Kalvina (2015), where the authors have investigated engagement drivers of academic staff at one large higher education institution in Latvia and explore the link between staff satisfaction, loyalty and engagement. What they have found out was that it is important to ensure variety of learning opportunities and career growth possibilities. Since job meaningfulness contributes to work engagement and loyalty to organisation, it is worth investing in job characteristics and job design by raising psychological meaningfulness and thus promoting work engagement. Leaders should ensure fair treatment, transparency of procedures and policies and equal opportunities for all staff members in order to raise the level of trust in the organisation and management. The most interesting discovery by this research, however, is that academic staff's engagement levels exceed their satisfaction, which means that employees of the educational institution might not be satisfied with their work environment and conditions, still they experience relatively high engagement due to the nature of their work and due to their personality traits that help them to experience pride and meaningfulness despite of the missing job satisfaction. This is another proof that personality traits of an individual play essential role in defining their engagement with particular work mission.

Based on information gathered from all the studies, Authors conclude that correlation between certain character traits and engagement with life exists. Based on the literature review, authors summarized character strengths that correlated the most with life engagement and happiness in Table 2.

Table 2.

Character strengths with highest correlation with life engagement.

	Character strenghts with high correlation					
	Wisdom and Knowledge	**Courage**	**Humanity**		**Transcendence**	
Number of study	**Curiosity**	**Zest**	**Love**	**Social intelligence**	**Gratitude**	**Hope**
Study No.1	x	x	x		x	x
Study No.2	x	x			x	x
Study No.3		x	x		x	x
Study No.4		x				x
Study No.5	x	x	x		x	x
Study No.6		x	x	x		x
Study No.7	x	x	x		x	x

Study No.8	x	x	x		x	x
Number of occurances in studies	**5**	**8**	**6**	**1**	**6**	**8**

As seen in the Table 2., **Curiosity** – the taking an interest in ongoing experience for its own sake, **Zest** - approaching life with excitement and energy, **Love** – valuing close relations with others, **Gratitude** - being aware of and thankful for the good things that happen and **Hope** - Expecting the best in the future and working to achieve it consistently showed highest correlation with life engagement and happiness.

Authors found especially fitting the explanations provided by Nansook Park, Christopher Peterson and Martin E.P.Seligman (2004) – *"Gratitude connects one happily to the past and hope connects one happily to the future. Zest and curiosity reside in the here and now. Love is the manifest in reciprocated close relationships – the domain in which ongoing life plays itself out in the most fulfilling way."* From this perspective, the results of all these studies seem logical and even expected to some extent.

Practical Insight

45 MBA students of Riga Business School were asked to answer 12 questions measuring employee engagement, based on the Gallup approach. Answers were given on a 5 point Likert scale, where 1 = strongly disagree; 2 = disagree; 3 = neither agree nor disagree; 4 = agree and 5 = strongly agree. 60% of those or 27 students answered mostly positively (agree and strongly agree) to 10 or more questions.

According to overall research this can be considered as rather high ratio of engaged people for a general pool of respondents, given the widespread belief that there are only 13% of the people around the globe engaged with their workplaces (Gallup, 2016).

The same students were asked to assess themselves on a 5-point scale answering questions about their life position, such as:

1) I consider myself being generally positive and optimistic person, I expect things to turn out well in a first place;
2) I am happy with my life in general;
3) I know my goals in life and sooner or later I am successfully achieving them;
4) I use my failures to learn from those and be more successful next time;
5) My success in life and at work is primarily dependent on my own thoughts, attitude and effort;
6) If I see a situation where I know I can help, I will offer my advice or support even if I'm not asked to do so;
7) At work and in life I often do more than I'm expected or asked to do, going an extra step for the sake of better outcome is a natural thing for me.

It was, then, obvious that the ratio of people in the audience responding with "agree" or "strongly agree" to the given set of questions was even higher – 71% or 32 people. Perhaps, even more informative is the fact that those people in the audience who scored low in their responses to personality diagnostics, stating mostly "disagree" and "neither agree nor disagree", were all demonstrating low results in respect to their engagement score.

Limitation with this survey is that it is a small exercise with a very specific audience – Business Administration students who would be in general expected to be more engaged as personalities and taking responsibility for their own success through investing in their business education and committing effort to achieving their targets. As S. Achor (2011)

has elaborated: "*being engaged does release dopamine and serotonin, which can make you want to work harder and subsequently be more successful. Working hard and recognizing the goals you are achieving can also release dopamine and serotonine*". Nevertheless, the conclusion out of this exercise is that it is worth to repeat it with a larger and more general pool of respondents to see what are the correlations.

Idea about engagement positive character traits can be further supported or triggered towards more engaged state through a smart use of technology and game elements by the organization. Application of game mechanics addresses engagement, transparency of work and the connection between employees' actions and business outcomes, by leveraging people's natural desire for competition, achievement and status output.

For example, by trying to look for causes of the low employee engagement levels in a specific company, the management received feedback from employees that information and communication about the business goals and overall business processes is insufficient (Ergle, 2015).

In order to improve this situation, the management introduced a tool to engage young employees – a simple prediction game that allowed employees to win prizes, thus providing an incentive for employees to get involved. This tool allowed the management to pitch new ideas and projects to the employees in a simple format and receive feedback from staff. Results showed slight but considerable improvement in employee commitment score by 5 percentage points. Although it is only a small increase, participants reported higher sense of responsibility about the projects that were included in the tool, it fostered communication between employees, gave them detailed insight in the strategic decisions in the company and therefore made them more engaged in the work processes.

Gamification offers new ways to align employee behavior with organizational goals. For example, instead of telling an employee that he "meets expectations," it is better to say that he did not clear the second level of the game. Such approach strongly support increased engagement levels, specifically for the younger generation individuals possessing engagement positive character traits described above.

Conclusions and Recommendations

Because of all above, authors have made a conclusion that scientific research proves existence of strong correlation between certain character traits and individual employee's engagement with his or her work.

Following conclusions resulting from the scientific research review Authors recommend organizations to design their recruitment and selection guidelines incorporating instructions to assess potential candidates for their compliance with personality traits as outlined in Table 2. and to hire individuals who are ranking high in Zest (vitality, enthusiasm, vigor, energy: approaching life with excitement and energy; not doing things halfway or half-heartedly; living life as an adventure; feeling alive and activated), Hope (optimism, future-mindedness, future orientation: expecting the best in the future and working to achieve it; believing that a good future is something that can be brought about), Gratitude (being aware of and thankful for the good things that happen; taking time to express thanks) , Love (valuing close relations with others, in particular those in which sharing and caring are reciprocated; being close to people) and Curiosity (interest, novelty-seeking, openness to experience: taking an interest in ongoing experience for its own sake; finding subjects and topics fascinating; exploring and discovering). Companies and business enterprises should always consider their staff as a capital, which is the driving force for success and positive employee and customer experience in the future. Human resource management policies should also investigate possibilities to increase level of job satisfaction that supports full exposure of character traits associated with high engagement with life and that will lead to higher level of engagement at work. That can be, in many cases, aided by the smart use of technology and use of digital game elements within human

resource management processes. By doing so, companies will secure their employees stay working there for longer periods and demonstrate better results that will unavoidably reflect in higher employee and also customer satisfaction and overall reputation of the organization.

Recommendations for Further Research

Within future research, it would be interesting and useful to test above theory-based conclusions into practice and see whether those organizations that apply recommended selection criteria succeed achieving higher employee engagement.

Game elements often can be adopted at little or even zero direct cost, therefore, companies should be able to take in use these new methods and include them in their organizational processes.

The use of electronic and digital game elements to gamify processes in HRM have great power to increase motivation and influence employee behavior and engagement. Although, there are several papers on various gamification models that have empirical analysis of the main underlying reasons of why gamification is successful, there is rather limited availability of such reports in relation to gamification used in Human Resource management. It would be valuable to pursue further research in the given direction.

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THE INTERNATIONAL TRADING SYSTEM DEVELOPMENT OF THE DIGITAL ECONOMY

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Abstract. The aim is to analyse the global economic impact of digitalization on the international trading system development.

Development of international trade on the one hand depends on the world economy; on the other hand international trade development provides global economy.

At present, the international trading system development is determined by a number of tendencies. First, the United States and several other countries trade policy milestone in bilateral trade agreements. Secondly, the rapid digitalisation of the world economy, creating new forms of trading, and creates new opportunities for the classic commercial transactions.

If a shift to bilateral trade agreements and protectionist ideas revival objectively brake on the development of trade, the world economy digitalization promotes development of international trade, creating the requests of the international trading system improvement

Key words: *digital economy, international trade*

JEL code: F13

Introduction

International trade is based on the international division of labour. One of the factors affecting the international division of labour is an economic digitization. With the development of digitization is changing the international division of labor forms. If in the past it was characterized by national specialization in the production of certain goods, now dominated by the technological specialization. Technological specialization development is largely determined by the role of transnational corporations in the global economy growth. Multinational corporations encourage international production and cooperation. This process leads to the development of the contradiction between the economic process of globalization, and their capacity to influence the national economy, internationalization and the state's ability to regulate the national economy. One of the manifestations of these contradictions is an international trading system development.

World economic development is determined by scientific and technical progress. Countries place in the international division of labour is determined by its scientific-technical level of development.

1. The International Trading System Making Historical Aspects

In order to understand the development of the international trading system must take into account historical conditions.

International trade is largely dependent on the country's external policy. Country's external trade policy can contribute to international trade or the country's external trade policy can slow down the development of international trade. There are two approaches to the country's external trade policy. The first approach is protectionism. The theoretical basis of the concept consists of protectionism mercantilism. Originally, the concept of protectionism adherents' arguments was the need to ensure the accumulation of gold in the country and a positive balance of trade provision. Later, it was used for

other arguments, economic independence for and protection of infant industries. However, almost simultaneously with the development of the concept of mercantilism, otherwise began to develop the concept - the concept of free trade. Free Trade theoretical concepts foundations put A. Smith and D. Ricardo. The concept of free trade began to dominate the 19th century. However, it should be noted that the economic crisis did not contribute to complete the transition to free trade principles. Economic crises, governments have a strong desire to move from free trade policies on protectionist policies. Examples include the United States. US foreign trade policy after the First World War can be described as protectionist. This was justified by the fact that US companies will lose in competition with European firms. According to the presidential order of September 19, 1922 were elevated import tariffs. European governments also increased tariffs. This meant commercial launch of the war. Later continuing protectionist US policy was adopted Smoot-Hawley law, completing the previously adopted decisions. As a result, the average US tariff rate reached 59%. These measures are the result of international trade growth stopped. The situation worsened in 1929-1933. Economic crisis.

Against this historical background of the Bretton Woods conference in 1944 it was discussed issues on development of international trade after the 2nd World War. Most countries after the World War II was implemented protectionist politics. It was preserved pre-war tariff and quota rates, and introduced additional restrictions such as currency control.

In order to improve the situation in the United States offered to draft a new international trade order, which would be based on the principles of liberalism. In practice, the US already in 1934 launched a new trade policy, which was based on the principle of free trade. During the period 1934 to 1945 the United States concluded 34 bilateral trade agreements[1]. US offered to other countries to establish the International Trade Organization. International Trade Organization Statute discussion began in 1946. 1947 Havana was agreed International Trade Organization (Havana Charter). During the negotiations, representatives of 23 countries signed a document on the entry into force of the International Trade Organization Statute of the fourth paragraph (Trade policy). The signed document got the name of the GATT (General Agreement on Trade and Tariff). Purpose of this document was to launch the international trade liberalization process. In the negotiations on the International Trade Organization's adoption of the statute had entered a dead end. In Nevis supported the US approach, many countries wanted to maintain a variety of restrictions. This dispute as a result the United States refused to ratify the International Trade Organization rules. The only document regulating international trade in the GATT.

2. Establish International Trade System

Concluding the GATT agreement states regarded it as a temporary measure. Contract work until then, when were signed the International Trade Organization statute. However, the GATT existed more than 50 years. Because it was the only document which was locked liberalization of international trade rules and conflict-resolution mechanism.

The need for a multilateral agreement on international trade contributed to the continuation of negotiations within the framework of the GATT. Negotiations also influenced by historical context. The collapse of the colonial system, and appeared in many new countries. Western Europe and Japan became economically stronger. In 1961, the UN General Assembly adopted a resolution: "International trade as an important economic development tool"[2]. Based on this resolution it established the United Nations conference on trade and development.

International negotiations GATT issues are within the range were expanded. If at first it was discussed issues of customs tariffs, then later in the Uruguay Round were discussed issues such as tariffs to non-tariff instruments, trade in

[1] Jackson J. The world trading system. Law and Policy of international economic relations. Cambridge (Mass);London: The MIT Press,1997 p35-37

[2] Abrief history of UNCTAD,http://unctad.org/Templates/pageasp?intlemID=3358&LANG=1

services, dispute settlement, intellectual property, the establishment of the WTO, trade and the environment[3]. These negotiations led to the agreement package:

- GATT – 94. “General agreement on tariff and trade”
- GATS “General agreement on trade in services”.
- TRIPS “Agreement on Trade-Related Aspects of Intellectual Property Rights”
- TRIM ”Agreement on Trade-Related Investment Measure”

These negotiations, the most important result were the creation of the World Trade Organization. To the World Trade Organization it can be considered that was established in modern international trading system...

The international trading system is a unifying mechanism that includes international trade, international trade involving states, companies and private business representatives, as well as a number of international regulatory institutions. Within the framework of this system, a huge number of participants from all countries of the world interact, economic and political intergovernmental associations and organizations - WTO, IMF, UNCITRAL, ICC, etc.

3. International Trading System Development In The Digital Economy

Development of international trade in the 21st century - TECHNICAL down scientific progress. Thanks to scientific and technical progress the emergence of new industries. It appears on the market new products, new technologies and services. Continued production internationalization emergence of new forms of international division of labour, such as "global supply chain", "global production chain," "global value chains". To a large extent, these achievements result from the digitization of the economy.

These processes also affect the development of international trade. Because the emergence of new forms of marketing and technology.

Examples include e-commerce. E-commerce has become one of the national economic development-determining factors. The low cost of contracting over the Internet allows companies of all sizes to expand their sales abroad and look for suppliers.

- Business-to-business (B2B). B2B accounts for the bulk of the value of e-commerce. It can involve online versions of traditional transactions related to goods that are subsequently sold to consumers via retail outlets. It can also involve the provision of goods and services to support other businesses, for example because of outsourcing and offshoring. There are various specialized B2B platforms, typically catering to certain industries or value chains.
- Business-to-consumer (B2C). B2C involves sales by "pure play" e-commerce enterprises to consumers and by traditional bricks-and-mortar retail or manufacturing firms that add an online sales channel. There is a wide range of channels to reach consumers, including social networks, crowdsourcing platforms, dedicated e-commerce websites, mobile applications and more. The products sold may be physical goods as well as digital products and services.
- Consumer-to-consumer (C2C). C2C e-commerce can be seen as a modern version of the classified advertising section in a newspaper or an auction. It covers online marketplace platforms (e.g. eBay or Taobao), and sales within online communities, consumer blogs and chat rooms.
- Business-to-government (B2G): B2G transactions are similar to B2B, except that the buyer in this case is a government entity, such as when it makes requests to bid through public e-procurement.[4]

[3] The GATTYears:from Havana to Maracesh;http/wto.org/english/thewto_e/watis_e/hif_effacty_e.itm
[4] Source: UNCTAD, 2015a.

E-commerce and information and communication technologies can contribute to economic growth and sustainable development. The report "On the Information Economy of 2015: Release of Electronic Commerce Potential for the Benefit of Developing Countries", UNCTAD experts note that e-commerce continues to grow in both volume and geographical scope. E-commerce is receiving increasing attention on the international development agenda, including in the outcome documents of the World Summit on the Information Society and in the decisions of the 9th Ministerial Conference of the World Trade Organization.

According to UNCTAD estimates, the value of e-commerce transactions between enterprises (B2B) in 2013 exceeded $ 15 trillion. The global volume of e-commerce transactions between enterprises and consumers (B2C) in the same year was estimated at $ 1.2 trillion. Although it is still significantly smaller than B2B, this segment is growing at a faster pace. The authors of the Report note that China has already become the largest global e-commerce market for B2C - both in terms of the number of network buyers and in terms of revenue[5].

E-commerce B2B and B2C has a number of proven and potential advantages, such as deepening participation in international production systems, increasing market access and market coverage, increasing domestic and market efficiency, and reducing transaction costs. It can help create employment in the information and communication technology (ICT) sector and in enterprises that become more competitive through purchases and sales in an interactive environment.

To assess the conditions for the development of electronic commerce, the new e-commerce index of B2C UNCTAD.

The UNCTAD B2C E-commerce Index 2016 is composed of four indicators: Internet use penetration, secure servers per 1 million inhabitants, credit card penetration and a postal reliability score. This year's Index was improved by increasing the geographic coverage (from 130 to 137 economies) and fine-tuning the indicator to measure the delivery aspect of e-commerce. The straightforwardness and transparency of the Index allow countries to compare how they perform in different areas. The 137 economies represent 96% of the world population and 99 % of world GDP.

Despite the fact that digital technology provides great opportunities, but thus there is a need to improve the international trading system. In its rules and regulations that were developed by establishing the World Trade Organization, UNCTAD and others, no longer meet the new requirements. Consequently, it has begun a new phase in the international trading system into line with the new requirements. One example:

In 2005, the United Nations Commission on International Trade Law (UNCITRAL) adopted the Convention on the Use of Electronic Communications in International Contracts. The international business community welcomed the signing of this Convention as a sign of the growing legal recognition of the conclusion of treaties in electronic form, particularly in developing countries. This was a valuable development that facilitated the development of cross-border e-commerce and operations. This convention resolves several key issues

- The UNCITRAL Convention allows e-mails to meet the requirements of other international conventions without the need to revise each of these conventions on an individual basis;

- The Convention contains provisions that require signatory countries to recognize the legitimacy of electronic communications used in treaties, as well as provisions that relate to issues that normally arise in electronic agreements, such as the location of parties, the requirements for information and format, invitations to do Sentences, time and place of sending and receiving of incoming messages.

- The Convention strengthens the legal certainty of the concept of party autonomy and confirms it. The parties' autonomy is an integral element in the conclusion of contracts in electronic form. The Convention allows the parties to formulate their electronic agreements in the most productive manner. While the International Chamber of Commerce

[5] Information Economy Report 2015 - Unlocking the Potential of E-commerce for Developing Countries»

developed a number of documents regulating the e-commerce Electronic conditions ICC (ICC eTerms). In 2004, ICC developed the "Electronic Conditions" - additional provisions intended for use in international contracts by companies around the world. The electronic terms of the ICC are a number of articles designed to be included by the parties in their contractual documents in order to show that they intend to conclude a binding electronic contract.

- Electronic UCP (eUCP). ICC has developed an addition to the UCP 500 for the electronic submission of documents within the framework of letters of credit transactions. Briefly called eUCP, this appendix consisted of 12 articles and was intended for use in tandem with UCP 500 in cases where documents are submitted in electronic form
- partly or completely. In 2006, the eUCP was updated in order to comply with UCP 600, which came into effect on July 1, 2007.

One of the most important problems in commercial transactions is a partner identification problem. Digital economy solves this problem with the electronic signature.

In order for the electronic signature mechanism to work, it is necessary to take a number of steps at the international level. In many countries, electronic signature laws that include rules concerning certification services are being developed or already adopted.

ICC has developed a set of recommendations that are designed to help states and businesses ensure the reliability of electronic authentication and electronic signature, which will facilitate the conclusion of international transactions in electronic form. Here are some of these recommendations

- ICC recommends that the freedom of the treaty be ensured when establishing the rights and obligations of the parties using electronic signatures.
- The standards of electronic signatures used or recognized by governments should be technologically neutral, commercially available, allow the use of technological innovations and should not give preference to any particular decision
- Recognizes the need for legal recognition of certificates and electronic signatures, both nationally and internationally. According to the ICC, they should be supported by the adoption of appropriate government measures.

Concluding contracts in electronic form can also use other options such as:

TradeCard (www.tradecard.com) - is a service for corporate clients (business business) for international payments. Essentially, it provides an electronic alternative to other international payment mechanisms, providing a secure way to manage purchases payments internationally by connecting buyers, sellers and partners to a paperless hosting platform.

Bolero (www.bolero.net) - is a neutral protected platform for processing trade-related documents; Its goal is to create an opportunity to conduct paperless trade between buyers and sellers with the participation of their logistics services and partner banks. The services of this system increase operational efficiency and reduce the time required for processing documents for a trade transaction.

The WTO's E-Commerce Programme and the inclusion of digital issues in some bilateral and regional trade agreements signal the importance of trade in digital goods and services, as well as cross-border data flows, for the trading system. But the absence of a conceptual approach to the international trading system into line with the requirements of the digital economy[6]

Although the February 22, 2017, entered into force within the framework of the WTO Trade Facilitation Agreement developed. This agreement aims to simplify and facilitate the export and import operations. The contract contains

[6] https://www.wto.org/english/tratop_e/tradfa_e/tradfa_e.htm#II

provisions on accelerated movement, release and clearance of goods, including goods in transit. It also sets out measures for effective cooperation between customs and other appropriate authorities on trade facilitation and customs compliance issues. It still contains provisions on technical assistance and capacity building in this area.

However, it should be noted that in this agreement are not fully covered by the rules and regulations relating to international trade in the digital economy.

Conclusion

International trading system development can be described as a process of adaptation taking place in the world political and economic processes. Economic digitization process on the one hand creating new opportunities on the other hand it creates a new situation and new problems that need to deal with. Therefore, the international trading system based on multilateral agreements, the replacement of bilateral agreements is a disincentive. Economic benefits of digitization can take only a free trade conditions, while free trade is the cornerstone of the international trading system.

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THE CONTEMPORARY CAREER SUCCESS FACTORS – DYNAMICS AND CLASSIFICATION

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Abstract. The global economy and technology progress with following financial crises impact the labour market and employment relationship. Today staying employed and being demanded in the labour market has more significance than getting promoted. It changes the way people define the success. And it triggers the traditional career management – before it was part of the benefit package offered by employer, now organizations find themselves to be the tools in the hands of talented career capitalism oriented people.

The goal of the paper is to develop the contemporary career success model and define the hypothesis for the further career success research in Latvia.

The literature review uncovered the dynamics of career success factors moving from the results to the behaviours leading to the career success. Authors propose the career success model consisting of : job related factors (job satisfaction, job motivation, occupational commitment etc.), organisation related factors (organizational commitment, social support at work etc.), network related factors (role, social integration at work etc.) , individual skills and attitudes related (political knowledge and behaviour, ability to use skills etc.) career rewards related factors (met income expectations, work-life balance etc.), and career related factors (career engagement, satisfaction with career etc.).

The research provides insight to the contemporary career success definition, establishing the factors affecting one's career success. The findings are interesting both for scientific research and practionnairs.

Key words: *careers, compensation, personnel management, workers*

JEL code:M5, J3

Introduction

The term "career capitalism" became possible in the era of knowledge economy after people adopted the boundaryless career attitude – not so much bothering about the loyalty towards one employer or occupation, but rather preferring career decisions which satisfy individual 's needs and values (Arthur and Rousseau, 1996). Career capitalism assumes that the responsibility of one's career success solely lies on the individual rather than organization, and that individuals use organizations as tool to pursue one's goals. Career capitalism means person who has taken charge of his/her career development, and approaches any employment relations as one's entrepreneurial activity.

The foundation for this kind of career attitudes lies both with development of global economy and technology progress whereas staying employed and being demanded in the labour market has more significance than getting promoted. It changes the way people define the success.

Lawrence et al. (2015) distinguishes 3 periods of career management: "1950–1970 in which the focus was individuals or organizations or occupations; 1970–1989 with a focus on individuals within organizations and occupations, and 1989 to the present, which expanded to focus on individuals within, outside and across organizations and occupations"

(Lawrence et. al 2015). Authors, following Gaile and Šumilo (2015), argues that there are four types of career attitudes present in today's economy:

- traditional career (Buchanon 2004) - assuming individuals moving up the hierarchy of the organization they have joined;
- protean career - promoting career as mean to accomplish personal values (Hall 1976 in Hall 2004);
- the boundaryless career (Arthur and Rousseau, 1996) - focusing to secure individual's rather than needs of any organization;
- the career as entrepreneurship - calling everyone to view his/her professional capabilities as a capital and exploit them consciously (Korotov and Khapova 2013).

The traditional and protean career approaches rely solely on the organizations as the main bodies of career management. The organization is the one which offers career opportunities for its actors and provides career management as a part of human capital management. Therefore the career has been considered as a benefit secured by the organization person is working for.

The boundaryless career approach develops in era where individuals forced by the pressure of the external environment (unemployment, flattening organizational structures) and inspired by information technology opportunities, became able to maintain the employment which suits the best the desired lifestyle of an individual. The responsibility for the career management shifts to the side of an individual.

The approach of the career as entrepreneurship requires individual to assume full responsibility of one's career management. It means the individual views its capability to work (knowledge, skills, attitude, health etc.) as a capital and maintains it accordingly.

These different approaches to one's career requires different attitude and behaviour to succeed. The career success and factors contributing to it is discussed in the next chapters.

The aim of the paper is to categorize the factors contributing to contemporary career success, and to define the hypothesis for the furtherer empirical research to establish person's behaviours leading to successful career.

The following tasks are accomplished:

1) The term "career success" is defined
2) The factors influencing career success are analysed and categorized
3) The hypothesis are defined to establish the one's behaviours leading to successful.

The paper is conceptual and is based on theory review.

1. Career Success

The term "career success" consists of two concepts, and each of them has a range of objective and subjective interpretations. The term "career" having its etymological roots as "a road" in todays business and management world is understood as either the "field for or pursuit of consecutive progressive achievement especially in public, professional, or business life" or "a profession for which one trains and which is undertaken as a permanent calling" (Oxford dictionaries).The career management specialists have developed the term "career" from "the sequence of the jobs" to the "sequence of the professional experiences" (Arthur et. al. 2014)

The term "success" could be replaced by the terms "result" or "outcome", and Oxford dictionary explains success as the degree or measure to the one's goals achievement. The current research on success in the career has moved from measuring objective factors – salary level, promotions (Restubog 2011), to subjective factors e.g. job satisfaction, life

satisfaction. Ng and Feldman (2014) marked this affect based studies and perception based studies (Ng and Feldman 2014).

To meet the purpose of this paper Authors will define career success as the one's satisfaction with the achievement of career goals which can be expressed both as objective parameters, and as the subjective perception.

It is in line with the lately agreement in the literature that both objective and subjective factors are important when one's career success has been assessed (Restubog 2011, Schockley 2015, Lau V.P, 2002, Abele et. al 2014, Arthur et. al. 2005, Maurer et. al 2013).

Different sources identify different factors impacting the career success. The Authors analysed what specific factors have been taken into account to uncover one's career success to identify what are the ingredients of the career success today, and have they changed during last decades.

2. Methodology and limitations

Authors analysed 25 articles published after 2011 and the article "Career success in a boundaryless career world" by Arthur, Khapova and Wilderom (2005) to identify the career success factors utilized the most often (Arthur et. al 2005). The articles have been found in databases ScienceDirect, Sage, Emerald and JStor published after 2005. The top 12 factors for each time period have been identified, Authors calculated the significance of each factor by calculating it's share out of top 12 factors.

After Authors analysed the previous research results to identify the impact of different factors on the career success whether it was positive, negative or neutral and if the impact was direct or indirect. The results of the empirical research of other authors have been. In case the impact was indirect the factor influenced in the first place was inscribed.

As the final step the classification of the career success factors has been analysed and new classification model has been proposed developing the hypothesis for the further empirical research.

The limitations of the paper is it's only theoretical framework taking into account the results of 25 articles. The further research might bring up additional career success factors and/or their impact on the career success, nevertheless Authors believe that the captured literature discovers the trends of career success measurement and research.

Research Results and Discussion

1. Career Success Factors.

Arthur et. al. (2005) have identified altogether 135 different career success influencing factors in the literature (Arthur et. al 2005). Authors analysed 25 articles referring to 46 career success factors. The results of the literature analysis are presented in the table 1 "Career Success factors in literature before 2002 and after 2005".

To analyse the career success factors, Authors have chosen the articles which headlines include the terms "career success" and "career outcomes". The term "career success" has been discussed in previous chapter. The career "outcomes" is another term other authors used to describe the achievements in one's professional life (Greenhaus et. Al. 1999, Baruch 2014).

There are different terms used to evaluate, for example, individual's income (Converse 2014). It has been referred as salary (Mauerer 2013, Stumpf 2015, Hirschi 2015), gross salary (Verbruggen 2015), pay (Borooah 2009, Colakoglu 2011, Weber and Ladkin 2011), rewards (Van Scotter et. al 2000 in Arthur et. al. 2005), total annual compensation (Dreher and Cox 1996 in Arthur et. 2005) compensation, financial outcomes (Martins et. al. 2002 in Arthur et. la 2005), remuneration

(Boudreau, Boswell, and Judge 2001 in Arthur et. al. 2005) etc. For this paper Authors use the term "income" –as stated by Oxford dictionary "any sum that a person or organization receives either as a reward for effort (e.g. salary or trading profit) or as a return on investments (e.g. rents or interest)" (A Dictionary of Business and management 2016).

Table 1.

The significance of career success factors in literature before 2002 and after 2005

No.	Before 2002			After 2005		
	Factor	**Frequency**	**Share**	**Factor**	**Frequency**	**Share**
1.	income	50	37%	job satisfaction	13	27%
2.	career satisfaction	18	13%	career satisfaction	9	19%
3.	promotions	21	16%	income	8	17%
4.	managerial level	18	13%	advancement	2	4%
5.	job satisfaction	15	11%	career adaptability	2	4%
6.	perceived career success	3	2%	conscientiousness	2	4%
7.	career commitment	2	1%	emotional stability	2	4%
8.	intent to stay	2	1%	good relationships with management	2	4%
9.	life satisfaction	2	1%	job security	2	4%
10.	life success	2	1%	life satisfaction	2	4%
11.	organizational commitment	2	1%	promotions	2	4%

Source: author's calculation based on bibliography

To analyse the career success factors, Authors have chosen the articles which headlines include the terms "career success" and "career outcomes". The term "career success" has been discussed in previous chapter. The career "outcomes" is another term other authors used to describe the achievements in one's professional life (Greenhaus et. Al. 1999, Baruch 2014).

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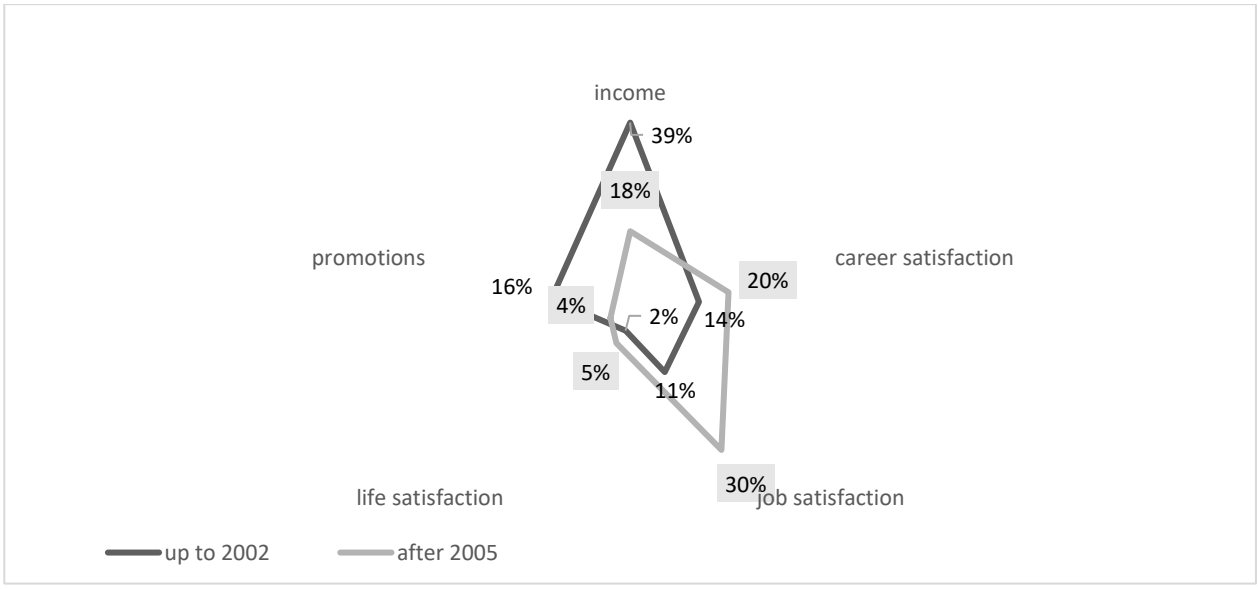
The other examples are "promotions" and "hierarchical level", where different terms are used like "managerial promotions (Tharenou 2001 in Arthur et. al 2005), promotion rate (Campion et al. 1994 in Arthur et. al 2005), hierarchical success (Aryee et. al. 1994 in Arthur et. al. 2005) for "promotions", and work role (Peluchette and Jeanquart 2000 in Arthur et. al. 2005) managers career level (Scheer and Reitman 1997 in Arthur et. al. 2005), managerial level (Melamed 1995 in Arthur et. al 2005) number of organizational levels between manager and CEO (Taylor et. al 1996 in Arthur et. al. 2005).

The research uncovered the shift in perception of the career success factors (see Table 1). Career success before 2002 were measured major by: rewards/relative salary/remuneration/salary/income/compensation/salary growth etc./financial success, career satisfaction, promotion, promotion rate/promotability ratings, job/managerial level/rank, job satisfaction,

perceived career success, career commitment, intent to stay in the profession/to remain, life satisfaction and life success (Arthur et al. 2005) . After 2010 the following indicators of successful career and their sequence have been established: job satisfaction (Spurk et. al 2014, Rodrigues et al. 2015, Colakoglu 2011, Converse 2014), , career satisfaction (e.g. Zacher 2013, Rodrigues 2015), salary, pay, income (e.g. Colakoglu 2011, Chudzikowsky 2012, Stumpf 2015) , advancement (Weber and Ladkin 2011, Abele et. al. 2015), career adaptability (e.g. Praskova 2014, Zachie 2015) conscientiousness (Chudzikowski 2012, Abele et al. 2014), emotional stability (e.g. Abele et. al 2014, Chudzikowsky 2012), good relationships with management (Drabe et. al 2015, Sousa Pouze and Sousa Pouza 2000), job security (Borooah 2009, Abele et al 2014) and life satisfaction (Rodriguez 2014, Baruch 2014).

It can be noted that career success research is moving from externally observable factors (income, hierarchical level), to inner personal characteristics (conscientiousness, emotional stability, proactivity). Authors conclude that the career research moves from capturing the results of career management to the process of career management, emphasizing the factors which can be influenced by the individual rather than pre-set by the organizations.

The comparison of Arthur et.al. (2005) study and current study shows significant change of factors to be considered as the career success foundation. There are 5 matching career success factors out of top 11 factors identified as critical for career success by theoreticians – income, career satisfaction, job satisfaction and promotions (Figure 1).



Source: author's calculations based on data in Table 1.

Fig. 1. **The career success factors share.**

The further analysis of the share of each career success factor discovers the shift form the extrinsic career success factors (income from 39% to 18%, and promotions from 16% to 4%) to intrinsic factors – job satisfaction from 11% to 30% and career satisfaction from 14% to 20%.

Overall satisfaction with life has relatively small impact, but still shows increase from 2% to 5%.

The scheme discovers that not only the content of the career success factors, but also the impact of each career success factor has changed. The career success for a long time has been a motivational "carrot" organizations offered to their employees. It requires the obvious objective indicators. The IT development and financial crises of 2008 have led to the flatter organizations with fewer possible hierarchical levels and non-ability to increase salaries (Gaile and Šumilo 2015).

Today other motivational factors shall be emphasized – possibility to do the job one likes and shift the focus from pure work achievements to the any other area of life – hobby, family, community (Hall 2004).

2. The Impact of the Career Success Factors.

Further Authors analysed the impact of different factors to the career success identified in previous researches). 34 factors having positive impact on career success have been identified.5 factors were found not influencing the career success and 7 factors were proved to undermine the possible career success (see Appendix 1 "Career success factors impact").

The impact on career success can be direct (27 cases) or indirect (21 case). There are 8 factors found to be interrelated, meaning the improvement of the factor improved the career success and visa versa, e.g. job embeddedness (Stumpf 2015), goals effort, sense of calling, self-confidence, objective success, psychological success, external recognition, identity change (Hall and Chandler 2005).

The most often the factors of personal nature have been analysed (e.g. Colakoglu 2011, Verbrbruggen 2012, Baruch 2014, Zacher 2015), pointing the direction of required further research what kind of person's traits, attitudes and behaviour facilitates the career success.

The job satisfaction (Spurk et. al 2004, Verbruggen 2015) and career satisfaction (Zacher 2014, Colakoglu 2011, Rodriguez 2015) are the factors majority of Authors find either directly or indirectly affecting the career success. It can be concluded that the perception of the situation is important to evaluated the career success.

The analysis of the career success factors impact lead to necessity to classify the factors by the content.

3. The Career Success Factors Classification and the Development of the Hypothesis

The vast amount of the carer success factors calls for classification. There are number of authors who already have classified the career success factors (Driers eta 1l. 2008, Zhou et. al 2012, Poona 2015, Shockley et. al. 2015). Ng and Feldman (2014) have analysed the career success hurdles and provided classification, which we believe can be applied also for factors facilitating the career success. The overview of the different classifications found by Authors is presented in the table 2.

To contribute to the further development of the career success factors classification, Authors propose the following classification (see Figure 2):

1.Job related
2.Relationship related
3.Personals skills and attitudes
4.Rewards
5.Career related.

Job related factors show the individuals perception and attitude towards the job. There are included job satisfaction, occupational commitment, work centrality, job motivation, job involvement, work engagement, job importance, job control, job security, job challenge, current job embeddenedness. The Authors assume that the job satisfaction will icrease or remain the same over the period of time which leads to the hypothesis:

H1 The same or increased job satisfaction during the period of one's employment in the current position leads to the higher career success.

The **relationship** factors are important both as the resource to build succesfull career (network size, relationship with manager, sponsored mobility mentors, promotion opportunities, procedural fairness general organization support, career oriented organizational support) and as the environment setting the benchmark to compare one's career success with others (social integration at work, , social status and reputation, , role, father's occupational status).

H2 Good relationship with colleagues leads to higher career success.

H3 The trust of a manager leads to a higher career success.

Table 2.

The career success factors classification

No.	Author (year)	Career success composites
1.	Gattiker & Larwood (1986) in Shockley et. al 2015	Job success Interpersonal success Financial success Hierarchical success Life success
2.	Driers et. al. 2008	Performance Advancement Self-development Creativity Security Satisfaction Recognition Cooperation Contribution
3.	Zhou et al 2012	Intrinsic fulfillment External compensation Work–life balance
4.	Ng, Feldman (2014)	Background related hurdles, Trait related hurdles, Motivational hurdles, Skills related hurdles, Social network hurdles, Organizational and job related hurdles
5.	Poona (2015)	Objective factors (achievement, ability to support family, formal learning), Subjective factors (making a difference, satisfaction, work-life balance, goal fulfilment, informal learning) Internal factors (traits, skills, personal history, motives, ongoing learning, career management) External factors (work context, social context, societal context)
6.	Shockley et. al (2015)	Recognition Quality Work Meaningful Work Influence Authenticity Personal Life Growth and Development Satisfaction

Source: author's summary based on literature review

People always have ought their careers, just organizations have taken responsibility for managing them (Career encyclopedia). The career management responsibility shift to the individuals calls for deeper understanding of what kind of personal skills and attitudes will allow somebody to achieve the success if it's professional life, e.g., career adaptability,

mobility, proactive personality etc. political knowledge and behaviours, network behaviour, skill utilization, low participation in training and development, son's education, achievement goal orientation, proactive personality, functional mobility, career related strategies, career planning, intrinsic fulfilment, occupational self efficacy, confidence, concern, skills development, advancement, boundaryless career orientation.

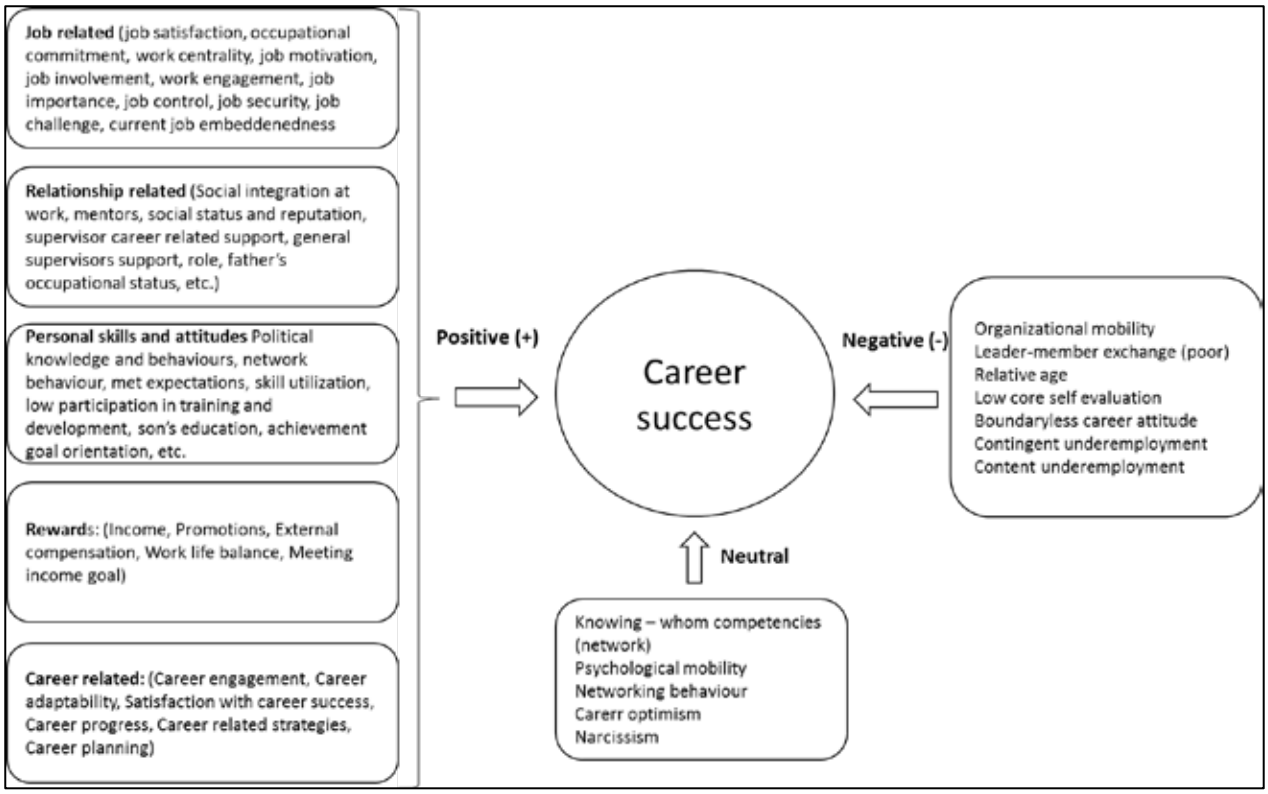
H4 Maintaining high career adaptability secures higher career success.

Reward is important factor to secure one's motivation. Putting effort in something shall result in some tangible non-tangible results to create the feeling of meaningfulness. Therefore the reward factors - income, promotions, external compensation, work life balance, meeting income goals, in career success outline are important.

H5 Perception that one receives fair income leads to higher career satisfaction.

As the fifth group Authors distinguish the **career** related factors - career engagement, career adaptability, satisfaction with career success, career progress. As indicated in definitions part, the success can be measured only if the actor has defined the goal for particular process, and worked towards it.

H6 Higher career satisfaction leads to higher career success.



Source: author's construction based on.bibliography

Fig. 2. **Career success factors classification**

Beside the factors having positive influence on the career success the current research identifies the factors which either has neutral or negative impact on the career success. Relationship factors knowing-whom (network), personals skills and attitudes – psychological mobility, networking behaviour and narcissism, and career related – career optimism had showed no impact on career success in some of the research.

The negative impact on career success is drawn by personal skills and attitudes: boundaryless career attitude, low core self-evaluation and organizational mobility, the relationship factors – poor leader-member exchange is associated with

the poor career success. Both contingent and content underemployment have negative impact on the career success as they are associated with low possibility to utilize one's skills and knowledge.

There is a research showing the relative age has a negative impact on the career success, but Authors will exclude this factor from further research and/or analysis as it cannot be changed neither by individual, nor external environment.

Conclusions, Proposals, Recommendations

1. The career success is significant phenomenum in everybody's life. The career success has been shifted by the financial crises of 2008 together with the global IT development, which reduced the possibility to make upward career (close to traditional understanding of the career), and made both people and scientists look for another definition of the career and its success.
2. Authors define career success as the one's satisfaction with the achievement of career goals which can be expressed both as objective parameters, and as the subjective perception.
3. The career success factors have been analysed discovering the dynamics within the career success factors before 2002 and after 2005. The share of the objectives factors (salary, promotion, hierarchy level) are vanishing from the career success picture being replaced with intrinsic factors like job satisfaction, career satisfaction and personal traits and attitudes.
4. Authors have identified 52 factors having positive impact on the career success and provides new look to the classification of them, introducing the success factors groups: job related, relationship related, personal skills and attitudes, career related and rewards related.
5. Authors have established 5 hypothesis for the further empirical research, and believe that the career success will only grow its topicality in upcoming years in changing global environment.

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eWOM FACTORS INFLUENCE ON CONSUMER DECISION JOURNEY

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Abstract. Many studies on consumer behaviour prove that time spent online is increasing considerably every year. It has been proven that Internet has become an important tool to provide information during consumer purchase decision journey. Part of it is a so-called electronic word of mouth (eWOM) communication which allows consumers to access and exchange information, to share opinions through different networks, social groups and other tools. This information which consumers spread by the help of social networks, recommendation systems and other eWOM communication tools is one from many factors which influence consumer purchase decision. Research done in other countries does show that the influence of eWOM communication is increasing fast. Still, the authors' experience has shown that companies in Latvia are not yet utilising the full potential of available eWOM communication tools and there is also limited research done on consumers' attitude towards eWOM in Latvia.

Therefore, the aim of the paper is – to evaluate different eWOM communication factors' influence on consumer purchase decision, to understand an importance and specifics of those factors in Latvia. To achieve the aim, the authors have defined following tasks for the paper: 1) to explore what does so far realised scientific research has found out about eWOM communication influence on consumer purchase decision process; 2) to assess how eWOM is perceived by consumers in Latvia by measuring customer perceived eWOM credibility, eWOM experience, susceptibility to interpersonal influence (CSII) and eWOM effects.

Research methods used are consumer survey gathering primary data and examining user attitudes towards eWOM and secondary data analysis which reviews scientific research results in this specific field.

Research results contribute to the understanding of factors influencing the eWOM effect in Latvia. Results provide suggestions for entrepreneurs and marketing specialists in Latvia.

Key words: *electronic word of mouth (eWOM), purchase decision, social networks, recommendation*.

JEL code: M31, M39

Introduction

Explosion of digital media in the last decades ensures that consumers are exposed to broad range of opinions coming from very diverse sources. Amount and variety of word of mouth communication is increasing every day - consumers not only consume, but also produce many of the information resources available online (Flanagin & Metzger, 2013). Word of mouth communication (further called WOM) in general is recognized by many authors (Kaufman & Horton, 2015) (Laudon & Traver, 2015) (Strauss & Frost, 2014) as a very important marketing communication tool and assumed to be the primary factor behind 20-50% of all purchase decisions (Berger, 2013). Expansion of internet fostered appearance of a new electronic word of mouth (further called eWOM) communication tools which allow consumers to exchange information and their opinions about brands and products also online. Consumers are spreading eWOM through social networks online recommendation systems (further called ORS) and other eWOM communication tools and influencing consumer purchase decision. As a result, companies and brands are not anymore owning and controlling communication

about them, but have to take into account that consumers are freely disseminating online their opinion about products, brands, and companies.

Research done in other countries does show that the influence of eWOM communication is increasing (Iyengar, et al., 2009) (Oestreicher-Singer & Sundararajan, 2012). And it is known that one of main sources of eWOM communication is online reviews which has become an important tool of marketing communication as many consumers search online reviews before making purchase (Park & Lee, 2009) (Chatterjee, 2001). Still, the experience shows that local online shops in Latvia are not yet utilizing the full potential of ORS and might not be fully aware of its possible influence. There exist prejudices and stereotypes that consumers in Baltics are often tended to express their negative opinions when leaving feedback and advising others on some brand or product, and those stereotypes restrict businesses from using advanced ORS. But, the online market is not limited within the borders of one country and growing overall online retail share will attract more and more players from global market to Latvian market. Effectively working ORS which helps consumer to make the right decision might become a competitive disadvantage for online shops which are not yet using them. 44% of consumers in Latvia did purchase products or services in online during 2016 and this number increased five times since 2006 (Statistical Yearbook of Latvia, 2017). Obviously impact of online is growing year by year along the global tendencies (Euromonitor, 2016).

Therefore, the aim of the paper is – to evaluate different eWOM communication factors' influence on consumer purchase decision, to understand an importance and specifics of those factors in Latvia. To achieve the aim, the authors have defined following tasks for the paper: 1) to explore what does so far realised scientific research has found out about eWOM communication influence on consumer purchase decision process; 2) to assess how eWOM is perceived by consumers in Latvia by measuring customer perceived eWOM credibility, eWOM experience, susceptibility to interpersonal influence (CSII) and eWOM effects.

Research methods used were consumer survey gathering primary data and examining user attitudes towards eWOM and secondary data analysis which reviews scientific research results in this specific field.

Analysis of literature contained a review of scientific research results in the field mentioned above. The consumer survey done during March 2017 was gathering data from 200 consumers in Latvia on their eWOM communication habbits. Probability sampling method was ensured by using visidati.lv database.

Literature review

As defined by Burrow word of mouth (WOM) is passing of information among people through oral communication, and it often takes the form of storytelling. In the past, it was almost the only way how to transfer information, but after the invention of writing and other communication tools, WOM process has become more sophisticated, and it is not anymore so much linked with the "mouth" part of equitation (Burrow & Fowler, 2012).

The power of WOM has been recognized in marketing world already long ago. In marketing, WOM means that consumer of a product or brand communicates information about that product or brand to another consumer. Positive WOM generates a very positive outcome for a brand or product as consumers tend to trust such consumer-generated WOM more than traditional marketing materials. Worth to mention that also opposite works and negative information spread by WOM is most likely trusted by consumers without checking whether it is true. According to research done by Berger, WOM is the primary factor in 20-50% of all purchase decisions (Berger, 2013) and is already many billion industry by itself. But nowadays individuals are not anymore limited in communication to their friends, families or colleagues. The internet allows a disappointed customer to tell a several thousand friends with one mouse click his word of mouth on a specific product (Strauss & Frost, 2014). It is now called eWOM.

When a consumer wants to get info about some product – he can "Google it", post a question in SN, read online customer reviews or do other online activities which will provide a vast amount of "customer experiences" in the form of eWOM (Kaufman & Horton, 2015). eWOM encompasses a plethora of different forms and technologies (e.g. blogs, tweets, and shopping bots) of which online reviews are the most accessible and most frequently used.

Online customer reviews are an important source of product information, and consumers rely on these reviews to infer product quality and make purchase decisions. The importance of online customer reviews compels online retailers to use review systems that allow purchasers of the product to share their experiences with others by posting product reviews on the website (Pang & Qiu, 2016). Online ratings are a quantitative summary of experiences, attitudes, and opinions, usually expressed as stars or points, whereas reviews are open-ended, user-generated text messages about a product or service. The two forms can occur separately or in combination. The most prominent example of online ratings and online reviews is that by online retailer Amazon.com. (Floh, et al., 2013). There are different ways how ORS recommend products – based on the demographics of a specific customer, based on customer's historical purchasing behaviour, based on habitual behaviour gathered from customers who purchased or viewed similar products. There are also different methods how a site does personalization adapting itself to each specific customer (Schafer, et al., 1999). Those very specific personalization methods enhance greatly customer loyalty towards the specific site. Sites are learning their consumer habits and digesting this info through their systems. That allows them to present to consumer customized interfaces which are well matching needs of the specific customer. The more time consumer is spending for "teaching" ORS of some site – the more loyal she/he becomes to the specific site (Pine, et al., 1995).

The experiment done by Senecal and Nantel showed that ORS have a strong influence not only on loyalty but also on consumers purchasing decision. Results showed that subjects who viewed product recommendations selected recommended products twice as often as subjects who did not consult recommendations. The experiment also showed that online recommendation source in the form of "recommender system" was more influential than traditional recommendation sources even perceived as possessing less expertise than human experts and as being less trustworthy than other consumers (Senecal & Nantel, 2004).

It might be naturally assumed that only positive reviews play the role in influencing a consumer to make the purchase of a particular product. But, different researches are showing that best result is achieved when there are mixed (positive and negative) reviews provided. It is based on consumers' emotional trust – naturally people consider too positive reviews and comments to be artificially made and influenced by seller interested in them. When reviews are inconsistent, the influence of emotional trust on purchase decision is much stronger. This moderating effect of inconsistent reviews differs across genders. It is stronger for female consumers than for male consumers (Berger, et al., 2010) (Zhang, et al., 2014).

Online retailers use online ORS to recommend products and enhance promotion effect. ORS are an important element to increase consumer's loyalty towards the site. Many e-commerce sites disappeared because they were investing into consumer awareness, but were not increasing their customer loyalty. Well-functioning personalized ORS are keeping customers connected to the site which knows already a lot about his habits and preferences (Chaffey, 2011).

Further authors provide brief description of used concepts – customer perceived eWOM credibility, eWOM experience, customer susceptibility to interpersonal influence and eWOM effects.

1. Customer Perceived eWOM Credibility

Trust determines what people expect from a certain situation and it reduces uncertainty in both social and business interactions (Awad & Ragowsky, 2008). However, in virtual communities, customers cannot touch products or meet eWOM senders to develop trust. As a result, when customers read product information, reviews, and recommendations,

they must depend upon their own expertise and involvement to determine eWOM credibility. eWOM credibility is defined as the extent to which one perceives the recommendation as believable, true, or factual (Cheung, et al., 2009). In this paper credibility refers to the online recommendation or review itself and not trusting beliefs about a person or an organization. In eWOM consumer is first rating the credibility of the medium itself based on its surface characteristics and interface design. Afterwards online user evaluates the source and the message content. Source is evaluated in terms of its expertise, competence and trustworthiness, while message is evaluated from content, relevance and accuracy perspective. In the last stage consumer assesses the interaction of presentation and content with the consumer's cognitive state determined by consumers experience and acknowledgement (Wathen & Burkell, 2002). Accordingly, if consumer thinks the information is credible, he will have more confidence to adopt the eWOM comments and use them for making purchase decisions (Tseng, 1999). In empirical part authors are testing hypothesis (H1) that customer perceived eWOM credibility has a positive impact on eWOM effect and it also drives up consumer eWOM experience (H2).

2. eWOM Experience

In general consumers find it important to listen to the opinions of others before making their own purchase decision. They discuss their purchase intentions with friends, relatives and on the internet. As result consumers decision is influenced by those interactions. Recent researches on internet shopping demonstrate that there is a close relationship between internet usage levels and online shopping (Jun & Park, 2003) (Liao & Cheung, 2001) and serious online shoppers are heavy users of online reviews (Chen, et al., 2016). In the era of Web 2.0, considerably valuable and useful online product reviews have been generated and are easily accessible to online shopping consumers. Exploration of online reviews have gained popularity over the past decade in academic research (Zhang, et al., 2014) and business practice (eMarketer, 2010) because they are regarded as one of the key determinants of consumer product evaluation and can further impact consumer purchase decisions.

In empirical part authors are testing hypothesis that eWOM experience has a positive impact on eWOM effect (H3).

3. Consumer Susceptibility to Interpersonal Influence (CSII)

CSSI is defined as tendency to learn about products and services by seeking information from others. It is individual trait which shows the level of need to identify with or enhance one's image in the opinion of significant others through the acquisition and use of products and brands, to conform to the expectations of others or to seek information from others (Bearden, et al., 1989). In fact, individuals possess distinct levels of susceptibility to informational influence. It is a general personality trait that helps determine and explain consumer behaviours (Shukla, 2011). Different individuals are having different levels of susceptibility to information influence. Individuals with high susceptibility to informational influence construe themselves as dependent and informational, whereas individuals with low susceptibility to informational influence see themselves as independent and unique (Bearden, et al., 1989).

Therefore, in empirical part authors are testing hypothesis that higher CSII level leads to higher customer perceived eWOM credibility (H4).

4. eWOM Effect

Majority of e-commerce site provides the opportunity to write or read online consumer rating and receive or provide information or advice about the product in form of consumer review. While making the purchase decision many consumers are influenced by those rating and reviews and are adopting positive or negative attitude towards the specific products. According to research done by Nettelhorst et al. (2013) when reviews were presented, the valence of such information significantly affected participants' evaluation of the product regardless of the valence of ratings information.

Study done by Flanagin and Metzger (2013) shows that consumers trust user-generated information even more than information provided by experts under conditions that there is high information volume and their behavioural intentions converge with the online ratings information. According to Lusky (2013) 70% of consumers trust online reviews. Therefore, in empirical part authors are testing hypothesis that perceived eWOM credibility influences eWOM effect positively (H5).

Research results and discussion

Empirical part of this study explored the factors influencing eWOM communication in Latvia. Authors adapted and localized structural model developed by Park et al (2011) which measures factors – customer perceived eWOM credibility, eWOM experience and consumer susceptibility to interpersonal influence, and tested hypotheses how those factors influences eWOM effect.

Questionnaire was used as data collection instrument. Data gathered was ordinal scale as answers were provided in 5 point Likert scale format. Probability sampling method was ensured by buying respondent data base from SolidData which provides representative sample of population of Latvia. Electronic survey tool visidati.lv was used for questionnaire distribution and data gathering. Survey took place in March, 2017 and gathered 200 responses.

Factor experience of eWOM was measured by three items on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree. (1) (EEP1) "I always read online reviews written by others." (2) (EEP2) "I always write down online review by myself." (3) (EEP3) "I always read online consumer reviews when I was shopping."

eWOM credibility was measured by three items on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree. (1) (ECR1) "I believe online review is important and credible information." (2) (ECR2) "I believe online review is important and credible information." (3) (ECR3) "I always read online consumer reviews when I was shopping."

Factor – perceived CSII was measured by two items on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree. (1) (ECS1) "I like listening advices before shopping." (2) (ECS2) "Others' advices are important for my shopping."

Finally eWOM effect was measured by three items on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree. (1) (EEF1) "Online review affects my purchase decision crucially." (2) (EEF2) "I will buy things because online review is positive." (3) (EEF3) "I rely on online reviews when I purchase." (4) (EEF4) "There has been case when I did not purchase the product after reading negative online reviews."

Descriptive statistics

SPSS statistical analysis program was used for data analysis. Demographic profile of the sample showed that 44% of respondents were male and 56% - female. Average age of respondents were 42,2 years. 46% of respondents were from capital of Latvia – Riga, 25% - from other cities and 29% - from country area and small villages. 11% of sample were aged 24 or younger, 25% were aged between 25-34; 20% were aged between 35-44 and 46% of respondents were aged 45 or older.

Survey results showed that majority of respondents spend more than 3 hours daily using Internet (Table 1Table 1.

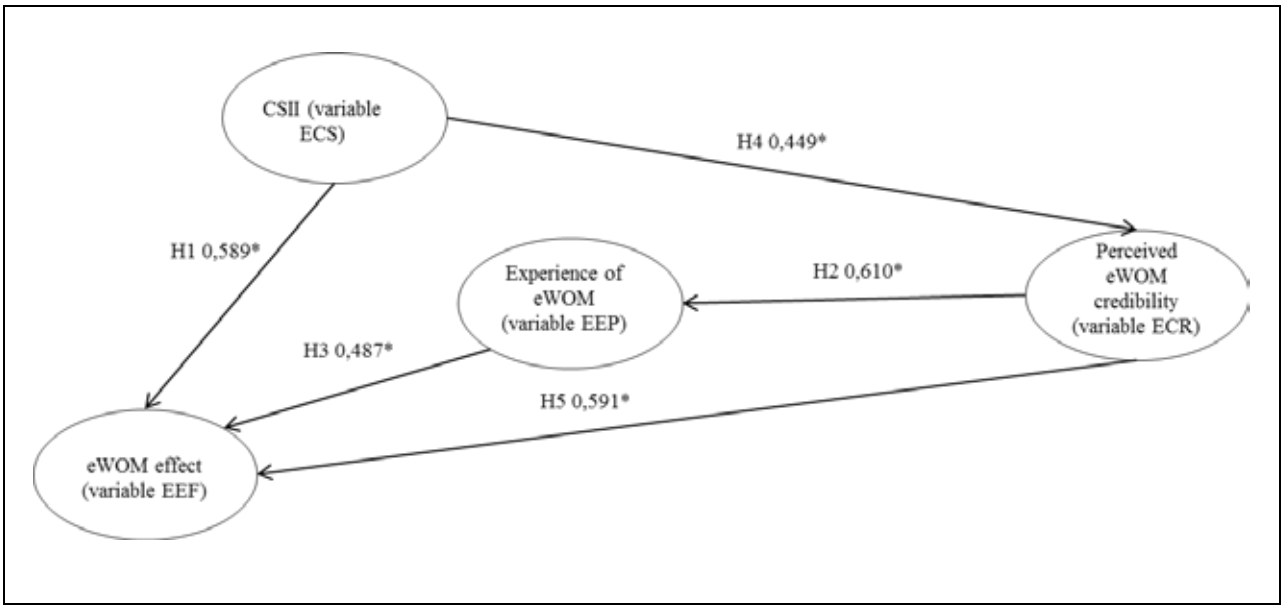
Table 1

Time spent on Internet

	N	%
Less than hour	13	7%
1 - 2 hours	69	35%
3 - 4 hours	62	31%
5 and more hours	56	28%

Source: author's calculations based on survey results

As variables were measured by composite scores authors calculated their Cronbach's alphas to check their internal consistency. Composite variable EEP which measures eWOM experience showed Cronbach's alpha 0,76 which is acceptable reliability level. Composite variable ECR which measures perceived eWOM credibility showed Cronbach's alpha 0,85 which is acceptable reliability level. Composite variable ECS which measures perceived CSII showed Cronbach's alpha 0,81 which is acceptable reliability level. Composite variable EEF which measures eWOM effect showed Cronbach's alpha 0,87 which is acceptable reliability level. As Likert scale questions allow to gather only ordinal scale data authors used Spearman's correlation to measure correlation between collected parameters and to test hypotheses that there is statistically significant positive relationship between variables. Figure 1 shows results of hypothesis testing.



Source: author's construction based on survey results

Fig. 1. **Relationships between variables (* p=0,000<0,05)**

The strongest positive relationship was for variables perceived eWOM credibility and experience of online review usage reaching correlation coefficient of 0,610 (p=0,000<0,95). It was followed by perceived eWOM credibility having strong positive relationship with correlation coefficient of 0,591 (p=0,000<0,95) with eWOM effect. Next coming rather strong positive correlation (0,589, p=0,000<0,95) between consumer susceptibility to interpersonal influence and eWOM effect. Experience of eWOM showed 0,487 (p=0,000<0,95) correlation coefficient with eWOM effect and consumer susceptibility to interpersonal influence showed 0,449 (p=0,000<0,95) correlation coefficient with perceived eWOM credibility. So, all five hypotheses were supported by gathered data.

Survey results also revealed rather unexpectedly low share of respondents who do not do purchases in online during the last twelve months – only 2,9%, others did purchase in online – 27,7% purchased different tickets, followed by 25,3% who purchased clothing and accessories and 19,3% who purchased some domestic appliance. That is matching with other sources reporting online purchasing habits in Latvia.

Conclusions, proposals, recommendations

This study contributes to understanding which factors influence eWOM effect in Latvia and how digital marketing managers should approach ORS to reach the best result. Based on the results of the theoretical analysis and the research done the following conclusions are derived:

1. The most significant influential factor was perceived eWOM credibility (H5) and it showed rather high average level 3,15 (standard deviation 0,86). This should be taken into account by local online shops in Latvia as only few of them use online reviews. Majority of them ignore this important influencer for consumer purchase decision.
2. Empirical results also showed that another influential factor is customer susceptibility to interpersonal influence (H1) – marketing specialists should take into account that consumers who are most ready to adjust their decision by listening to opinion of others are also most influenced by online reviews when making a purchase.
3. Less important, but still significant influencer is experience of eWOM (H3) – consumers who did use to read or write online reviews will be more influenced by online reviews made by other consumers when making their purchase. In the context of Latvia this might mean that consumers who are used to learn from advanced ORS (example Amazon.com) will be seeking for advices also in local online shops. Lack of ORS in this case might lead to consumers switching to another e-commerce site which ensures richer consumer created content.
4. It is also worth to mention that 97% of respondents did purchase online during last twelve month. As sample was random and representative – it means online purchasing is becoming a normal habit for majority of consumers in Latvia.

In conclusion authors advise online marketers and online site owners to enrich their e-commerce sites with online reviews to ensure this rather important influential factor in Latvia is well covered.

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THE ADVANTAGE OF DIGITAL DECISION MAKING FOR STRATEGIC DECISIONS – PROOFED BY AN SUPPLY CHAIN CASE

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Abstract. This paper will discuss the advantage of decision making supported by a digital system and will provide an overview. Decision making in organizations is a significant system implied task of managers and therefore a broad area in scientific research, not only in the discipline management– even from technical to humanistic disciplines. Nowadays the trend of digitalization captures all areas of live as well as the typical management task of decision making. Triggered by the digitalization trend business will move toward an autonomous decision making of machines or cyber systems. The important step toward autonomous decisions or decision support (cyber systems will prepare a decision, but finally executed by a human) will be the next development step for decision making. The hypothesis, that the digital set up for decision making in organizations will increase the efficiency of strategic decisions will be proofed by an empiric study. The research method for the empiric part of this paper is a questionnaire. This online questionnaire will be answered by professionals and scholar. As a typical example for a strategic decision, the author explains a business case in the supply chain function of organizations. The research findings of the questionnaire will illustrate that the digitalization of supply chain processes is in scope of managers and consultants, to reach higher efficiency by increased turnover or reduced costs. The result of this paper verifies an improved decision process by usage of digital features, but the capability of the entire digital possibilities is not fully achieved yet.

Key words: *decision making, digitalization*

JEL code: D22 Firm Behavior: Empirical Analysis

Introduction

Nowadays the megatrend of digitalization creates new challenges for the entire business environment. These changing elements enforce organizations to reconsider their way of doing business, even to rethink their entire business model. Digitalization is today and will be in the future a key driver for change in organizations and especially the process how decisions will be made. IT leadership, as one important function in an organization, is currently forced to make major changes, as digitalization of products and services is transforming traditional business models across industries. IT is no longer merely an internal corporate function that provides services for the organization's employees, but IT services are becoming embedded into sellable products and services, too (Collin J., 2015). In this new context, the focus on the wide area of decision making theory is quite important, from a more rational view to a more emotional view. Analysing decision making through the view of digitalization, completely new opportunities and approaches will appear in a close future. Setting the scene for the current state, a questionnaire was made with business and scholar professionals to understand the lack of opportunities and execution level of organizations. The strategic decision area of supply chain seems to be a very interesting field for research. The SCOR model is an accepted model of scholar and business, hence worth to analyse.

Theory of Digitalization & Decision Making

"Digitalization refers to the practice of taking processes, content or objects that used to be primarily (or entirely) physical or analogue and transforming them to be primarily (or entirely) digital. The effect of digitizing processes, aside from potential efficiency gains, is to make processes more tailorable and malleable" (Fichman R., 2014). Not only based

on data, moreover targeted on markets, organizations and processes digitalization will deploy its full value to businesses and industries. The new era of digitalization has started already and shows today a first step of a new business world with a change in division of work. In the early 20th century a "computer" was an employee calculating tables the whole day. In a first step, an automated computer (as we understand today) took over this task and increased quality and efficiency of this process. Since then, the automation of our world was ongoing and influenced by computers and machines. Important for the development was the definition of rules for computers, because computers are perfect in following algorithmic rules. (Brynjolfsson E. and McAfee A., 2014). Further actions took place to develop more feasibilities of machines, i.e. Apple iPhone is now with the software Siri able to understand and direct the user. This is a real quantum leap, because to automatize language and transfer this into instructions was a giant step change for the industry. Currently the speed of development is increasing, either the trend of "Industry 4.0" with full automation of the production flow (Zelinski P. 2016) or "artificial intelligence" that robots tend to make autonomous decisions and developed self-awareness and self-maintenance (Lee J. 2014) .

Referring to the effects of digitalization, this trend will completely change the way of making business and making decisions. Flexibility and transformability are key attitudes of successful organizations in the future and drive them on the road of digitalization (Bauer W., 2015). Digitalization will have an effect on customer structure and behavior, increase the efficiency of operations including their supply chain and at the end may change the entire business model. (Westerman G., 2014) Important to understand is the logic of digitalization and to realize the 4 levers of transformation. These 4 levers have to be in scope of the decision maker: (BDI, 2015)

Digital data (big data): Due to recording, processing and analysis of mass data, high-quality and more predictable forecasts and decisions are possible in organizations. The structure of big data is (Goes P., 2014):

- Volume: measured in Giga- or Terabyte
- Velocity: One time snapshot frequency streams
- Variety: structured, numeric, alpha, unstructured, text, voice / sound, image / video, genomics
- Veracity: Validation, noise level, deception, detection, relevance, ranking

Big data is a huge trend in digitalization, because the usage of data is important for an organization. As "the economist" wrote in 2010, "Data are becoming the new raw material of business." And data are increasing day by day. A strong increase of data traffic had happened and will further increase; in the future driven by digitalization, e.g. machine to machine communication or the trend of mobile data from every user of the internet. This traffic is permanently increasing, all devices are moving toward mobile and smart functions. The latest trend of data shows the movement from big to smart data which means data including utility, semantics, data quality and security (S. Jähnchen, 2015)

Automation: The traditional trend of automation is an ongoing process pushed by new technology and the need for efficiency to enable a competitive cost base. The combination of traditional work and technology with artificial intelligence will enable autonomous work in self-organization systems with high quality and high efficiency. As an effect, production speed will increase and unit costs will drop. Automation has different aspects of realization. First, the work volumes between man and machine are changing. Second, the trend toward a higher automation is still ongoing, up to entire fully automated factories without human beings. A work flow from machine to machine without human interaction is today possible and works without variances on a repeatable high quality level. The third step, artificial intelligence, is a self-learning system, with a set of different reactions based on environmental conditions. As an example, one new technological process is rapid manufacturing, which means that traditional production types will be replaced by new technology. This new technology uses directly digital data for production, without a tooling procedure. Cost intensive

tools are replaced by new manufacturing applications. These procedures are very flexible on an acceptable cost level and permit small batches. 3D printers are today on a level beyond testing and started their usage in business. Different possibilities of 3D printing enable a wide range of applications. (Bopp F. 2010)

Integration: Connecting the entire value chain by high quality broad band, will enable synchronized supply chains with shorter production cycles and faster innovation cycles (mobile or fiber opic net).An important integration in the era of digitalization is a deeper collaboration in the entire supply chain. Based on a more flexible consumption behavior a more agile supply chain has to deliver this flexibility. As a result a strong cross-company collaboration is a must, and online information has to be exchanged between the different entities. Cross-linking of organizations and their IT systems are the requirement for an efficient supply chain. And today's technology enables this process, based on standard software tools and open interfaces for an optimal data exchange between them. A fast changing world, with a drop in product life cycles, the integration between supplier and customer has to be on the level of a partnership, because a cross-company product development process needs to have speed in "time to market" on a cooperative relationship. (Wannenwetsch H. 2007) .

Digital customer access: New competitors, new services and new transparency will increase competition and market position of companies and brands. For customers the next opportunity is just one click away, hence a well thought out strategy is necessary to position against competition, no matter from which industry it's coming from. For the car manufacturer BMW the competitor isn't anymore only Audi or Daimler, now it's Tesla and Google, with their new approach of mobility. (Brynjolfsson E. & McAfee A., 2014).The consumer and customer, is again back in the center of scope of organizations. In the recent years consumer behavior and hence customer activities changed dramatically toward a less loyal, more flexible and quick response relationship. Increased mobile services, e.g. via smart phone increased this trend, and Kreutzer/Land described the consumer buzzwords as follows: "me, all, immediately and everywhere"; which is exhibited in table 1 "Customer Expectation: Me, all, everywhere and immediately".

Table 1

"Customer Expectation: Me, all, everywhere and immediately" (Kreutzer R. & Land KH. 2015)

Me	All	Everywhere	Immediately
Appreciation as must	Wide choice	Time independence	Instant contacting
(correct) Personalization	High quality	Location independence	Fast transactions
Tailored offers	Low prices	Independence of technologies, channels, devices	Short response time
Approach based on permissions	Good service		

The mentioned customer expectations are increasing, but in today's flexible world, this expectation is covered by competition, hence this has to be the mantra in an organization. The trend of "smartization" is still ongoing and will further move on, making all devices via networks intelligent. Starting with mobile phones, developed to smart phones, now we see smart TVs and smart watches. Also housekeeping is going smart, with refrigerators or washing machines, even energy consumption is steered with smart technology (Kreutzer R. & Land KH. 2015). As Porter describes new smart products for consumers with 3 core elements: physical, smart an connectivity. All 3 elements deliver customer value improvements and are substantial for a future market position (ME Porter & JE Heppelmann, 11/2014)

Decision theory is a wide area in science, with a long tradition. The first idea of decision theory reaches back over hundreds of years and is still relevant in the presence. Rational models were discussed from the neoclassical economists (e.g. Adam Smith or Max Weber) with a view on rational behaviour of agents which maximize their utility – the homo oeconomicus. A more scientific approach of Pascal and de Fermat shows a calculation of probabilities and Bernoulli laid the foundation of risk science by examining random events. Further developed by von Neumann/Morgenstern economic behaviour in a strong rational and mathematical approach, decision making follows utility maximization. Today's view of decision theory as an interdisciplinary science (economics, psychology, sociology, philosophy, mathematics, computer science and statistics) with different approaches is generally accepted (Buchanan L. and O'Connell A., 2006). One of the most popular is still the theory of games and economic behaviour (von Neumann J. and Morgenstern O., 1944). The theory of von Neumann/Morgenstern explains a rational behaviour of market participants (either consumers or entrepreneurs). Consumers strive for a maximum utility or satisfaction and entrepreneurs strive for maximum profits. Meanwhile a wide area of mathematical approaches and models of rational theories were further developed on the foundation of von Neumann/Morgenstern theories. The opposite of the rational view, is a behavioural view on decisions. In the late 1940ies Simon discussed the theory of bounded rationality, which means a certain influence of human attitudes with not pure rational decisions (Simon H.A., 1997). A deeper view in the psychology science shows that theories on behavioural economy are currently quite popular, because human behaviour is one part of organizational actions. In the 70ies Kahneman/Tversky developed the prospect theory. Also Reinhard Selten contributed research to the field of behavioral decision making.

1. Rational View: In the classical field of the economical view on decision theory, a rational, mathematical founded approach is discussed. The process of pure calculating to find a maximum of utility or profit is a typical rational procedure. In the dimensions of decision fields the alternatives are very important to analyse. There is only a decision problem, if there are minimum two alternatives. Hence a determination of these alternatives must be reflected in the decision model. In the next step an evaluation of these alternatives must be done. These consequences will lead to a result of the alternatives into the decision model. Important figures of the decision maker are defined as targets, these values are the result. (Laux H., 2014).

For a structured process the environmental conditions are very important. Measures are not manipulable by the decision maker, these measures are called decision relevant data. These data are no variables for the decision maker. These characteristics are decision relevant environmental conditions. The illustration of figure 2 "Structures of Environmental Conditions" (Laux H., 2014) shows different environmental situations and a possibility of designing decision conditions.

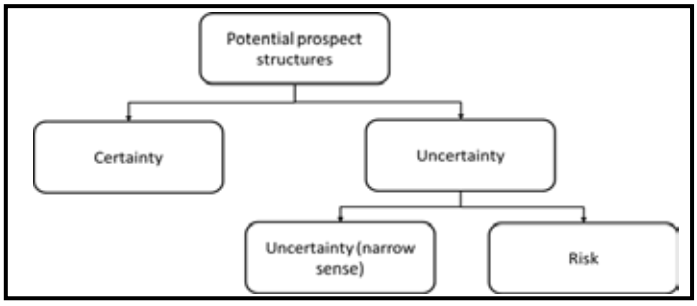

Fig. 2. **Structures of Environmental Conditions** (based on Bamberg G., 2012)

A decision structure under certainty means, that the decision maker has the real condition of the alternatives, hence all relevant information for the decision are given. Therefore the result is known and alternatives are certain. In reality

quite often decision models are formed as models of decision under certainty, because the set up and the usage of this model type is easier to handle (Bamberg G., 2012).

A decision structure under uncertainty means, that the decision maker has minimum two possible alternatives, but not all relevant information for a decision are given. Therefore the result is not known and alternatives are uncertain. In the case of uncertainty there are two more possibilities. Either for the decision maker it's not possible to calculate a likelihood of conditions (uncertainty – narrow sense) or for the decision maker the probability of occurrence of a condition is computable (risk); (Laux H., 2014).

This differentiation of the environmental conditions is important to define; especially decision making in the context of globalization and digitalization. While globalization creates more complexity and uncertainty, a more sophisticated model for decision making is substantial for an organization. In terms of digitalization a need for algorithmic structures is a must, computers need a mathematical logic to calculate a result for the decision.

2. Emotional View: Important developments in decision theory took place over the recent decades, though a trend to a behavioural approach was supported by psychological science. An outstanding contribution to the development of behavioural economies was made by Kahneman and Tversky. A collection of their scientific contribution and analysis is made in the book "Thinking, Fast and Slow" (Kahneman D., 2011). Describing decision theory with a strong psychological view makes decision more emotional than rational. Depending on the activated system in the mind; Kahneman named it system 1 and system 2. "System 1 operates automatically and quickly, with little or no effort and no sense of voluntary control" (Kahneman D., 2011) Examples: answer of 2 + 2 =?; Drive on an empty road, orient the source of a sudden sound. "System 2 allocates attention to the effortful mental activities that demand it, including complex computations. The operations of system 2 are often associated with the subjective experience of agency, choice, and concentration." Examples are to tell someone your mobile number or fill out a form. The human structure is based on usage of system 1, only if really necessary, system 2 is activated. (Kahneman D., 2011)

This concept of system 1 and system 2 set the basis for a human behaviour of decision making, which absolutely defers from a rational decision view. Continuing this idea, the question what prevents a rational decision should be answered with Kahneman/Tversky's prospect theory. The fact that lot of decisions have both elements, a risk of loss and an opportunity of gain, effects a decision to gamble or to deny. Focussing on loss aversion (Kahnemann D. and Tversky A., 1974) means, people avoid losses while there is a huge opportunity to gain this particular option. As a result people deny this option and this is controversial to a rational choice, with a pure calculation of probability. On the other hand the "optimistic bias" means that chances for success are overestimated. Risks are undervalued or not in scope of the decision maker (Kahneman D., 2011). Following the process, the maximum utility for the decision should be made. The main question is, if in an organization this strict process will be executed. As H.A. Simon explains, "all decision is a matter of compromise". In an organization with different interests of members, the question of a maximum utility for the decision problem is to be questioned. In an organization there is never a perfect achievement of targets reachable. The environment of the organization limits the alternatives and the maximum of utility (Simon H.A., 1997).

This opposite view to a rational decision process raises the question how the decision process in organizations is really made. Are organizations as rational as expected or are they emotional driven which have effects on decisions. The behavioural influence in organizations has to be respected and the result is based on this set up (March J. & Simon H.A., 1993).

Research Question & Hypothesis

Taking the described topic into scientific context, the research question is asking for a relationship between an intelligent digital setup for decision making and the quality of the strategic decisions. The intelligent digital setup means a well customized system for an organization which enables a more efficient process. The type of customizing has the respect the industry, customers and the organizational set up of a company, because every single organization has its own perfect fit in a competitive system. A digital setup means all organization's procedures transferred into a digital context, either fully digital in machines or executed by a cyber physical system. The quality of the strategic decision has to be taken into context to the origin of the decision. A profit improvement is not necessarily an indicator for a quality increase of a strategic decision, because not all strategic decisions are directly linked to profit increase vice versa sometimes profit happens by coincidental effects. The main hypothesis of this paper will analyse the dependency of the efficiency of strategic decisions and the digital set up for decision making in organizations (H0).

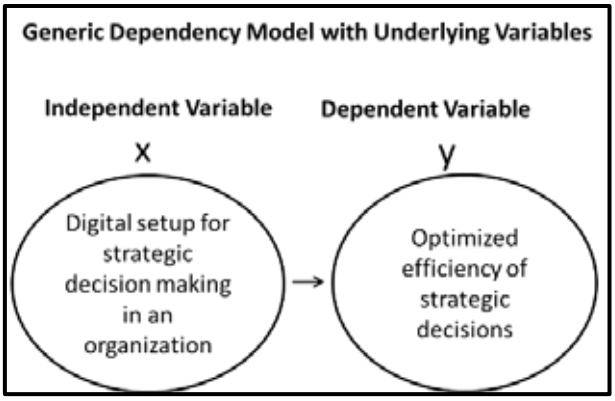

Fig. 3. **Generic Model of Digital Setup for Optimized Decision Making** (designed by the author)

The generic dependency model with the relevant variables is displayed in figure 3 and the basis for the subsequent research model. Based on the generic model, which has to be seen as an open model for various business cases, a more detailed model will be designed in the chapter "Research Model". In the generic model the independent variable "x" is the mathematical representative for "digital set up for strategic decision making in an organization" and the dependent variable "y" is the mathematical representative for "optimized efficiency of strategic decisions". To set the variable into relation, the following expression will be proved on validity:

- The more intelligent the digital setup for decision making of an organization, the better the quality of strategic decisions.
- The more human (manual) procedures for decision making of an organization, the worse is the quality of the of strategic decisions.

In the further analysis of the hypothesis the generic model has to be set in context with a real business case, to make assumptions and the prove these assumptions.

Research Model

The research model for this paper is based on the above mentioned generic model. As described, a supply chain business chase should be analysed on its dependency between the variables of "digital setup for strategic decision making in an organization" and "optimized efficiency of strategic decisions". The different values of the variables itself are quite interesting, but also the dependency of the variables.

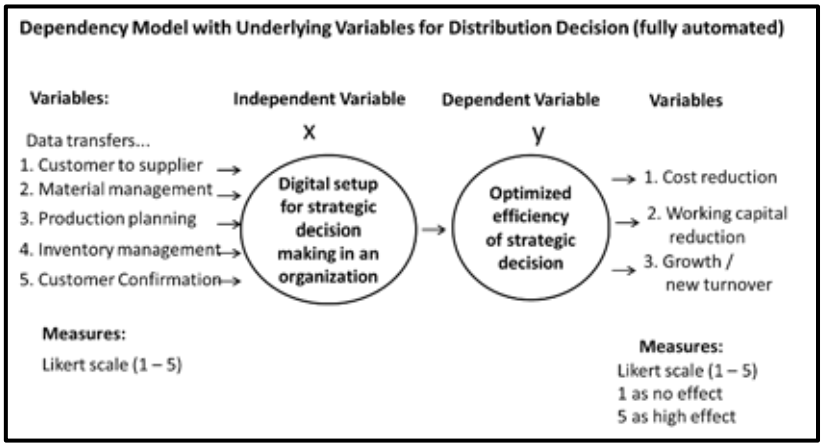

Fig. 4. **Dependency Model with Underlying Variables for a Distribution Decision** (designed by the author)

The definition for the independent variables are, as described in figure 4, the digital process of data transfer from customer to supplier, then into the material management, production planning and inventory management system. Followed by the customer confirmation if it's done on a defined digitalization level. For the dependent variable the relevant values will be analysed, from cost reduction over working capital reduction to turnover growth. For both variables the characteristics will be analysed in detail.

Empirical Design & Research Method

For the empirical design and the research method the above described supply chain case is relevant. Gaining data in an appropriate approach more data ensure a higher quality of the conclusion, hence a questionnaire is a common tool to collect data for a statistical approach. The questionnaire structure is asking in the first part for personnel and organizational data of the interviewee. In the second part of the questionnaire the digital characteristics of the process and data flow will be asked ("a-section"). The "b-section" questions will ask in general for the decision type, either if the decision is completely automated (autonomous by cyber systems) or a decision support process (digital preparation of a decision and final human decision making). "c-section" and "d-section" are more general and are asking for the questionnaire style itself, if there are any remarks and the level of difficulty of the question. In the third part of the questionnaire the goals and results of digital decisions has to be evaluated, to have the full picture of the research model.

This questionnaire will evaluate the digital characteristics of the supply chain process. Based on the SCOR model the selected process steps are customer forecasts and the subsequent activities until production will be analysed. Participants have to answer, if this process in their company is done digital or manual. After evaluation of the kind of data processing, the goal for the digitalization will be analysed. Key question for an organization is the strategic scope - more cost or revenue driven. The SCOR model describes the type of interaction between suppliers and customers, as shown in the following chart. For this questionnaire only the planning and sourcing part will be analyzed. This means forecasting of customer demand and availability of products and production opportunities are in the scope of this questionnaire.

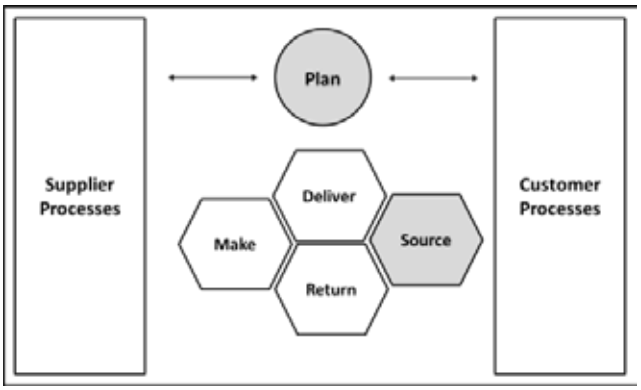

Fig. 5 **SCOR Model** (based on Bolstorff P. & Rosenbaum R. 2007)

The distinction between „Manual“ and „Digital“ will be defined as follows. „Digital“ means that data processing will be done automatically without manual or human interaction. „Manual“ means, that manual or human interaction is necessary to process data further in the workflow. If the process consists of both parts, please estimate in the given categories. “Decision support“ means, a proposed result is automatically calculated, but a manual approval (human interaction) is requried to finalize the process step. „Decision automated“ means that a decision is made by a machine without further human interaction. The SCOR model as description of supply chain processes in business are relevant and well known. In the following flow chart, the detailed process with all independent variables is defined. Starting from the customer forecast, as an external event the process will move then into the organization’s environment and is becoming an internal process. The availability of the requested products will be checked, if they are on stock. If the product is not available, the production planning and the sourcing process of materials will be steered, either manual or digital. To finalize this process, an order confirmation to the customer is necessary, meaning the process is moving from the internal organizations environment again external to the customer. In this questionnaire the relevance and the proportion of digital characteristics will be analyzed. All above mentioned process steps are manual or digital possible. The explained flow chart is the basis for the questionnaire and is in detail available in appendix A “Questionnaire”.

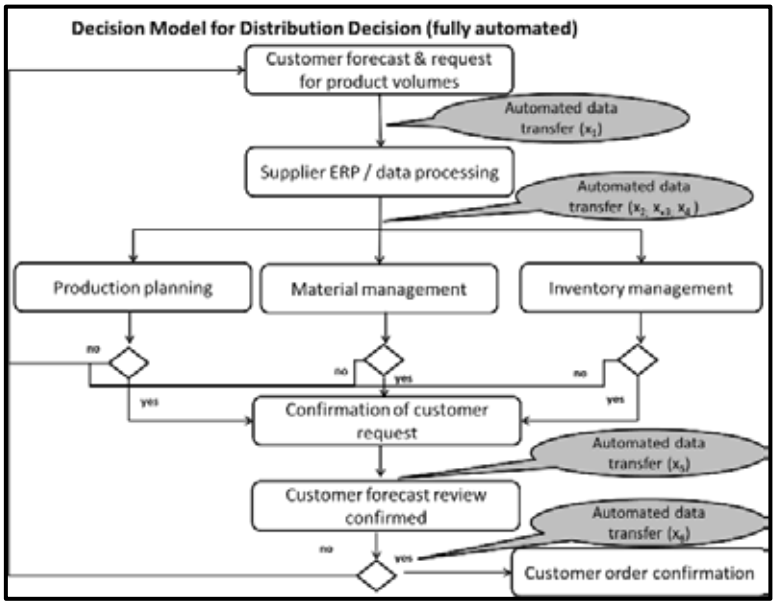

Fig. 6. Flow **Model with Underlying Variables for a Distribution Decision** (designed by the author)

Research findigs

Analysing the data from the above presented questionnaire will prove the hypothesis, if there is a dependency of the efficiency of strategic decisions and the digital set up for decision making in organizations. Based on 351 requests, feedback of 67 participants of the questionnaire was given, a return rate of 19%. The age of the participants were from 26 to 67, on an average of 44.2 years. Asking for the gender, a pattern with a male dominated structure in senior management positions was given - in numbers, 82% of the answers were male, 18% were female. The allocation of company size is displayed in table 2 “Organization’s Structure” by revenue and employees.

Table 2

“Organizations Strucutre” (designed by the author)

Revenue Distribution (quantity & percentage rate)				Employee Distribution (quantity & percentage rate)		
0 € to 2 mio €	3	4.5%		1 to 20 employees	5	7.5%
over 2 mio € to 10 mio €	7	10.6%		21 to 100 employees	13	19.4%
over 10 mio € to 50 mio €	12	18.2%		101 to 300 employees	6	9.0%
over 50 mio € to 200 mio €	12	18.2%		301 to 1.000 employees	10	14.9%
over 200 mio € to 1.000 mio €	16	24.2%		1001 to 10.000 employees	19	28.4%
over 1.000 mio €	16	24.2%		over 10.000 employees	14	20.9%
Total	66	100.0%		Total	67	100.0%

Starting the analysis from an overall view, question 11.a. will give an important first impression of digitalization effects in the supply chain process. “Agreement” to the statement of “process efficiency by digitalization” is given by 56.9%, “Disagreement” is answered by 23.1%. This analysis shows a strong trend in organizations toward digitalization and the attention for it. The correlation of “Agreement” to “company size” shows a constant pattern over all company sizes, hence all organizations are focused on the topic digitalization and agree to an improvement for digitalization. The disagreement rate is only between 21% and 33% over all organizations. Analyzing the process in detail, the author will start from the first step, with the incoming customer order. An overview over the typical statistical key figures is displayed in table 3 “Statistical Evaluation of the Questionnaire”. Comparing the individual process steps, outbound data from customers (forecasts) shows the smallest digital characteristics with the highest rate of a manual process. Once the data are in the organization, an increase of digital processing is obvious which is shown with an increased agreement of a digital workflow. Material management is showing an increased mean compared to customer forecast, but lower than the remaining process steps. This trend is ongoing to production planning and inventory management. The climax mean is shown in the process step of customer order confirmation, with a value of 3.39. The overall process is rated with a mean of only 2.8, which interprets that interviewees have a less opinion of their entire process compared to each single process step. The same trend is shown in the “b-section” of all questions, where interviewee had to evaluate the decision type (automated vs. decision support) für each process step. Despite the same trend between “a- and b-section” of questions 3. to 8., the “a-section” answers are showing a higher mean per each question. This shows that the first step of digitalization is realized is many organizations, but the full effect of digitalization with autonomous processes is not realized yet.

The correlation of a-section with b-section (questions 3 to 8) exhibit an value of 0.9, which means, that a more digital process supports an automated decision making process. It seems, that digitalization of processes is the foundation for the next development step of autonomous decision making of these processes.

Table 3

"Statistical Evaluation of the Questionnaire" (designed by the author)

Statistical Key Figure	3.a. Customer forecast data processing - manual or digital	3.b. Customer forecast data processing - automated decision or decision support	4.a. Data transfer into material management system - manual or digital	4.b. Data transfer into material management system - automated decision or decision support	5.a. Data transfer into production planning system - manual or digital	5.b. Data transfer into production planning system - automated decision or decision support	6.a. Data transfer into inventory management system - manual or digital	6.b. Data transfer into inventory management system - automated decision or decision support	7.a. Data transfer for customer order confirmation -manual or digital	7.b. Data transfer for customer order confirmation - automated decision or decision support	8.a. Overall evaluation of the process - digital or manual	8.b. Overall evaluation of the process - automated decision or decision support	9.a. Goal of cost reduction	9.b. Goal of working capital reduction	9.c. Goal of revenue growth	10.a. Achievement of cost reduction	10.b. Achievement of working capital reduction	10.c. Achievement of revenue growth	11.a. Overall: have you reached by digitalization a more efficient process?	11.b. Effects of digitalization on industry
Maximum	5	4	5	5	5	5	5	5	5	5	5	4	4	5	5	5	5	5	5	5
Mean	2.68	1.92	2.82	2.47	3.00	2.58	3.08	2.69	3.39	3.03	2.80	2.33	1.82	2.09	2.55	2.72	2.84	2.94	2.57	3.26
Stand.Dev.	1.14	0.97	1.35	1.32	1.37	1.38	1.45	1.39	1.29	1.28	0.96	0.88	0.93	1.08	1.18	0.96	0.96	1.13	1.13	1.29
Variance	1.30	0.93	1.81	1.73	1.88	1.90	2.10	1.94	1.66	1.63	0.93	0.78	0.86	1.17	1.39	0.92	0.93	1.28	1.28	1.66
Median	3	2	3	2	3	2	3	3	3	3	3	2	2	2	2	3	3	3	2	3
Mode	3	1	2	1	2	1	5	1	3	4	2	2	1	1	2	3	3	3	2	3

Focused on the objectives of digitalization of decision making, cost reduction is the key focus in organizations with a value of 77.3% agreement, followed by working capital reduction with a value of 70.3% and revenue growth with a value of 53.0%. This result shows a clear target of digitalization for organizations and their managers. The further effects of this trend on organizations should be analyzed in a further research, because this implies a change in organizational structures. Achievements of these objectives are on a lower level, which exhibits that digitalization is in the scope of management but not fully executed yet. Achievement ratio of cost reduction is 44.6%, working capital reduction 35.9% and revenue growth is 36.9%. The overall achievement of digital decisions in organizations is on a level of 56.9%, undecided are 20.0%, hence a minority evaluate digitalization not as an efficiency possibility in organizations.

The correlation of organizations which have a digital supply chain flow (question 8.a.) and a more efficient supply chain workflow (question 11.a.) is 0.54. This shows a relation between digitalization and increased efficiency in strategic decisions.

Conclusion

The impact of digitalization on decision making is given, because from the theoretical view, the type of decision making vary from a rational to an emotional approach. Digitalization will move decision making by cyber systems from emotional to rational decisions, based on algorithmic models. The idea to reach maximum utility, based on discussions from early economists to von Neumann/Morgenstern, seems to be the first time realistic, in the era of automated decisions. Emotions and side effects, which influences decision making will be ongoing eliminated by progressed digitalization.

Summing up the questionnaire results for digital decision making in organizations, the SCOR model as a strategic business case for decisions is well known by managers. The importance of digitalization is given by high involvement of interviewees and high quality answers including the high interest of results. Digitalization is not a matter of size, all

organizations are focused on this topic with a different pattern of progress. Depending on industries and customer approach, digitalization has a diverse status in organizations. Mainly driven by costs, working capital and additional revenue opportunities are the main motivators for them. This survey only contributes a small piece of insights into the new era of digitalization, but fits into the pattern, that digitalization is on the agenda of every organization and will influence their next strategic steps. To analyze the massive effect of digitalization on organizations further research has to be done in different areas of science. This paper highlighted only one small piece, with expected results, that digitalization will support the strategic decision making of organizations.

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ANALYSIS OF DEFICIENCIES OF DATA QUALITY DIMENSIONS

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Abstract. Based on scientific studies on data quality, authors developed data quality assessment framework containing 13 data quality dimensions: *data objectivity, data completeness, data representativity, data accuracy, quality of methodology, coherence, actuality, data accessibility, interpretability, informativeness, utility, statistical disclosure control, optimal use of resources.* The set of data quality dimensions has been tested with experts using some possible shortcomings of data quality dimensions: lack of scientific understanding, the concept has the ambivalent understanding, insufficient methodological support for the assessment of data quality dimension, too large variety of methods and the resulting diversity of evaluation results, only qualitative assessments of data quality dimension, insufficient quality of assessment methods of data quality dimensions. This paper presents some results of experts' survey on data quality issues carried out by the authors. The results illustrate the fact that the most problematic data quality dimensions are: data objectivity, data completeness, representativity, data accuracy, quality of methodology, coherence and interpretability. Scientific definitions and explanations should be streamlined and clarified, mainly for the following dimensions: data objectivity, quality of methodology, data coherence and interpretability. Assessment methodology should be developed for data completeness, accuracy, representativity, quality of methodology, coherence and interpretability. Both scientific definitions and assessment methodology should be developed for quality of methodology, coherence and interpretability. The empiric method (analysis of texts and documents) and the method of theoretical research (analysis of the experts' survey data) are applied.

Key words: *data quality, data quality dimensions, data users*.

JEL code: C0, C13, O31

Introduction

Providing information about the quality of data can impact decision-making as it gives an opportunity for decision makers to use data more efficiently and effectively.

Data quality is a multidimensional concept that is why data quality standards must include a range of quality characteristics (dimensions) which are consistent with the concept of 'fitness for use'. Data quality dimension is a set of features that represent one aspect of data quality or construct of data quality. These features of data quality standards should be considered and balanced in the design, implementation, and validation of data quality management processes. Based on scientific studies on data quality, authors developed data quality assessment framework containing 13 data quality dimensions: *data objectivity, data completeness, data representativity, data accuracy, quality of methodology, coherence, actuality, data accessibility, interpretability, informativeness, utility, statistical disclosure control, optimal use of resources.*

The aim of the paper is to present the results of experts' survey on data quality dimensions, as well as to identify some problems with data quality dimensions, like lack of scientific understanding, the concept has the ambivalent understanding, insufficient methodological support for the assessment of data quality dimension, too large variety of methods and the

resulting diversity of evaluation results, only qualitative assessments of data quality dimension, insufficient quality of assessment methods of data quality dimensions.

The Problem of Data Quality Dimensions in the Scientific Literature

In the scientific literature, there are several different definitions of data quality. One of the reasons why there is no common approach on defining data quality is that data quality is related to the use of data and cannot be evaluated in isolation from the data user *(Chrisman N.R., 1991*; *Strong D.M. et al., 1997)*. As an example, Redman *(Redman, 2001)* suggests that data of high quality should fit for their intended uses in operations, decision making, and planning. While one user may consider the data quality sufficient for a given task, it may not be sufficient for another task or another data user. The interpretation of the quality of some data item depends on the needs of data users and the tasks this statistical data should serve.

Secondly, the use of the data is usually explained as a multidimensional concept, which consists of a set of quality attributes, called the data quality dimensions and defined by data users *(Wang R.Y. and Strong D.M., 1996)*. Data quality dimensions are a foundational concept in the study of data quality and data quality management. For example, Redman *(Redman T.C., 2001)* considers that data are fit for use if they are accessible, accurate, timely, complete, consistent with other sources, relevant, comprehensive, ensure an appropriate level of detail, are easy to perceive and interpret.

Data quality dimensions like accessibility, timeliness, accuracy, validity, objectivity, credibility are widely discussed in the context of data quality. Authors found specific data quality dimensions in the scientific literature: breadth and depth (*Flick, U., 1992)*; instrumental utility *(Eisner, E.W., 1991);* openness and clarity *(Cohen, D.J., Crabtree, B.F., 2008)*; integrity *(Garman, N., 1994)*; portability *(Caby, B.C., Pautke, R.W., Redman, T.C., 1995)*; redundancy, context, conciseness *(Delone, W.H., McLean, E.R., 1992)*, sacredness, goodness *(Creswell, 2002, Patton, 2002, Spencer et al., 2003)*; fairness *(Lincoln and Guba, 2000)*; breadth and depth *(Flick, 1992)*; consensus, instrumental utility *(Eisner, 1991)*; openness and clarity *(Cohen and Crabtree, 2008)*; integrity *(Garman, 1994)*; resonance *(Tracy, 2010)*; extrapolation *(Patton, 2002)*; locatability *(Goodhue, 1995)*; portability *(Caby et al., 1995)* for which authors do not offer an unequivocal explanation.

For some data quality dimensions, many authors have developed a common understanding. The bright example is data accuracy. Accuracy is the first and foremost requirement that many users expect from data. Accuracy is evaluated by comparing data with their original sources. For example, "data accuracy refers to the degree with which data values agree with an identified source of correct information" *(Redman, 1997, Loshin, 2001)*.

Nevertheless, for certain data quality dimensions, there is still no agreement in the scientific literature on definitions and even assessment approaches. As an example, data completeness is considered in a broad sense and contains several themes. Different granularity levels (field, record, and table) may define completeness in different ways. For example, "data are of sufficient depth, breath and scope for the task at hand" *(Wang and Strong, 1996)*, and "knowledge workers have all the facts they need to perform their processes or make their decisions" *(English, 2009)*.

Based on the analysis of literature, authors has identified the following key gaps in data quality assessment.

- The term *data quality* in the scientific literature is explained extensively and in various ways, depending on a particular area or sector, it is used in, for example, in the health care industry data quality means that data fits data users' needs *(Canadian Institute for Health Information, 2009)*, a timely and reliable data are essential for public health to ensure the basic functions of all levels of government *(Institute of Medicine, 2003)*. In the scientific literature, there is an opinion that the quality of data is associated with data use and cannot be evaluated in isolation from the data user. Authors believes that this approach leads to ambiguous interpretation of data quality, in this case subjective factors are of high the importance.

- If specific data quality requirements are met, is usually assessed in the context of data quality dimensions. Each data quality dimension represents a specific aspect of data quality *(Wang, R.Y., Strong, D.M., 1996)*.
- Various authors offer different terminology of data quality dimensions, which essentially mean the same thing, for example, appearance and informativeness *(Delone, W.H., McLean, E.R., 1992)*. Sandelowski M. links dimension applicability with the term generalization *(Sandelowski, M., 1986)*, whereas, Guba E.G. refers to dimensions fittingness or transferability, which can evaluate applicability *(Guba, E.G., 1981)*.
- In the scientific literature relationships between completeness and consistency and between timeliness and accuracy are often discussed, but it lacks deeper analysis of causes and consequences of these relationships.
- Several scientists offer classifications of data quality dimensions, which is up to date in a particular sector or area, for example, Christy S. classifies data quality dimensions that characterize data quality of internet portals, in four categories: intrinsic data quality, accessibility data quality, contextual data quality, representational data quality *(Christy, S., Rajakumari, S.B. et al., 2010)*. In literature authors did not found classifications of data quality dimensions of statistical data.
- Almost no research results are available, which propose indicators for evaluation of data quality dimensions. Indicators for assessment of data quality dimensions must reflect the nature of the data and peculiarities of data; quality estimation differs for diverse types of data.

Indicators for assessment of statistical data quality dimensions. Authors developed a two-tier system of indicators on data quality assessment, which includes 13 data quality dimensions: data completeness, representativity, objectivity, quality of methodology, coherence, accessibility, accuracy of estimates, actuality, interpretability, statistical disclosure control, optimal use of resources, utility, informativeness (see table 1.).

Table 1.

Definitions and assessment indicators for data quality dimensions

Data quality dimensions and definitions	Indicators for assessment of data quality dimensions
Data objectivity *The ability of statistical data to reflect the actual situation and its independence from the data users' interpretations or evaluations*	1. Data acquisition form (statistical observation)
	2. Data stability over time
	3. Data changes freedom from external random events (e.g. political)
	4. Different survey question understanding (by statisticians and by respondents), the question is asked ambiguously
	5. Influence level of mentality (e.g. religion, culture, history, traditions) on the respondents' answers
	6. Impact level of public opinion on the respondents' answers
	7. Statistical data relevance to reality
Data completeness *Data meets user needs*	1. All the data are collected that are needed to carry out the assessment of the dynamics of phenomena
	2. All the data are collected that are needed to carry out the assessment of phenomena by objects (industry, enterprise size groups, types of innovations, etc.)
	3. All the data are collected that are needed to carry out the assessment of phenomena by objects (regions, etc.)
	4. Need for data interpolation
Data representativity *Sample data generalization capabilities*	1. Selected sample technique follows the task of statistical survey
	2. Sample size follows the statistical survey task
	3. The specific sample survey results attributing to the entire population
	4. The survey response rate
	5. Number of incorrect answers obtained during the survey
Data accuracy	1. Regular evaluation and testing of output data, intermediate results and statistical results

The degree of data reflection to the real situation	2. Regular assessment and correction of errors that may occur in the statistical data collection and processing process (sampling errors and non-sampling errors), according to Eurostat standards
	3. Regular analysis of data revisions to improve statistical processes.
Quality of methodology *Scientific justification of methodology (including approbation of methodology), correct use of methodology and unification level of methodology*	1. Quality programs and quality assurance procedures are approved and running in the statistical office
	2. Data collection and processing methodology is in compliance with EU and international benchmarks
	3. Data collection and processing methodology is scientifically justified, regularly monitored and improved
	4. Applied data correction and imputation methods, which are regularly reviewed, corrected and updated
	5. Data audits in accordance with the operational experience and clearly understandable procedures
	6. Questionnaires testing before launching the statistical survey
	7. Statistical indicators calculation methodology is scientifically justified, regularly monitored and improved
	8. Errors and shortcomings repair is carried out in accordance with certain standards
	9. Data collection and treatment process can be adapted to the needs of data users and a rapidly changing environment
	10. Operativity of implementation of new data collection and processing methodology and/or new indicators calculation methodology
	11. Unification level of statistical data collection and processing methodology
	12. Data adjustment in case of the research object changes (data correction, recalculation)
	13. Complexity of statistical data collection and processing, calculation methodology of statistical indicators for statistician
	14. Capability of resources (time, labor, finance, etc.) for data collection and processing
	15. Complexity of statistical data collection and processing for data users
	16. The proportion of complex indicators (e.g. GDP)
Coherence *Logical links between different statistical surveys' findings, the data from different sources are comparable*	1. The methodological consistency between the different statistical domains (indicators calculation methods, different definitions of the statistical unit etc.)
	2. Data from different statistical surveys are harmonized
	3. Statistical office cooperate with the administrative database maintainer on data quality assurance issues
Actuality *Data collection and processing speed and frequency of renewal*	1. Regular monitoring of statistical data actuality and practical utility
	2. Statistical data publishing date and time of is previously established and notified
	3. Statistical data is in compliance with needs of data users
	4. Frequency of renewal of statistical data
	5. Statistical data acquisition and data processing duration
	6. The time period between the end of the reporting period and the publication of preliminary data
	7. The time period between the end of the reporting period and the final publication of data
	8. The level of data users' satisfaction is regularly is monitored and systematically taken into account
Data accessibility *Simplicity of data availability to the users*	1. All data users' categories have equal access to the data and statistical surveys' questionnaires
	2. Information on the methods and procedures used by the statistical office is publicly available to data users
	3. Data dissemination is carried out in different ways: in print, files, CD-ROM, Internet databases etc.
	1. Data users have access to information on the final statistical data quality level in compliance with the European statistical quality criteria
Data interpretability *Statistical data collection and processing*	1. Statistical data collection and proceeding methodology is available to data users
	2. Definitions, calculation methodology, classifications etc. on socio-economic, demographic indicators are available to data users

methodologies is available to the data users in order to make the correct interpretation of data	3. Interpretation of dynamic statistical indicators (e.g. growth rate, etc.) is available to data users
Data informativeness *Data presentation form that will enable data users to capture data quickly and easily navigate the data range*	1. Data presentation form enables data users to perceive data and the right to navigate on the data range
	2. Data visualization enables data users to make a graphical analysis of the data
	3. Components of complex indicators are displayed schematically, which enable data users to understand the nature of the indicator
	4. Regional data are displayed on maps
Data utility *Data users' demand to the data*	1. Data can be used for different purposes (for decision making, for research, for forecasting etc.)
	2. Data can be used by different users' categories (government, researchers, organizations, media etc.)
	3. Data users' demand for data
Statistical disclosure control *Confidentiality of the information provided by respondents*	1. Ensuring of statistical confidentiality is stated in the law
	2. Confidentiality policy is available to the public
	3. Staff of the statistical office works in compliance with the instructions on the protection of statistical confidentiality during the process of production and dissemination of statistics
	4. External users who use data for research purposes comply with strict confidentiality rules
	5. Physical, technological and organizational measures are implemented in the statistical office to ensure the security of statistical databases
Optimal use of resources *Efficient use of existing resources for data collection and processing*	1. Use of resources by the statistical office is monitored with internal and independent external measures
	2. During data collection, processing and dissemination there is a maximum use of potential of productivity of information and communication technologies
	3. Various measures are being taken to improve the potential of administrative data for statistical purposes and to avoid direct surveys
	4. Statistical office promotes and implements standardized solutions that increase resource efficiency and productivity

Source: prepared by authors

Data quality dimensions proposed by authors are essential during every stage of producing statistical data, ensuring systemic approach towards data quality assessment (see Table 2.):

Table 2.

Essential data quality dimensions within data quality preparation stages

Statistical data preparation stages	Data quality dimensions
1.stage. Evaluation of the need for data	Optimal use of resources
2.stage. Statistical data production process planning and development	Quality of methodology, coherence of methodology, optimal use of resources
3.stage. Data collection	Quality of methodology, coherence of data and methodology, accuracy, representativity, objectivity, actuality, statistical disclosure control, optimal use of resources
4.stage. Data processing	Quality of methodology, coherence of data and methodology, accuracy, representativity, actuality, statistical disclosure control, optimal use of resources
5.stage. Data analysis	Quality of methodology, coherence of data and methodology, accuracy, actuality, optimal use of resources
6.stage. Data dissemination	Accessibility, informativeness, interpretability, utility, completeness, actuality, statistical disclosure control, optimal use of resources
7.stage. Data archiving	Quality of methodology, coherence of data and methodology, statistical disclosure control, optimal use of resources
8.stage. Statistical data collection process evaluation	Optimal use of resources

Source: prepared by authors

Analysis of Shortcomings of Data Quality Dimensions

Authors performed an experts' survey to find out which deficiencies are typical for data quality dimensions usinf the following point scale: 0 - deficiency is not typical for the data quality dimension, 1 - deficiency is typical for the data quality dimension, 2 - deficiency is highly experessed characteristic of the data quality dimension. In the survey participated 11 experts, who are responsible for production of statistical data (e.g., experts from the Latvian bank, the University of Latvia etc.). The survey was mainly paper-based, if necessary, survey questions were discussed with experts in person. As experts represent different areas, like academic environment, government sector, banking sector, etc., they evaluated data quality in their own field.

Judging by the experts' assessment (the median values), **the lack of scientific understanding** is typical for the following dimensions: interpretability, data coherence, quality of methodology, representativity, completeness and objectivity (the median value of experts' assessments is 2) (see Fig.1).

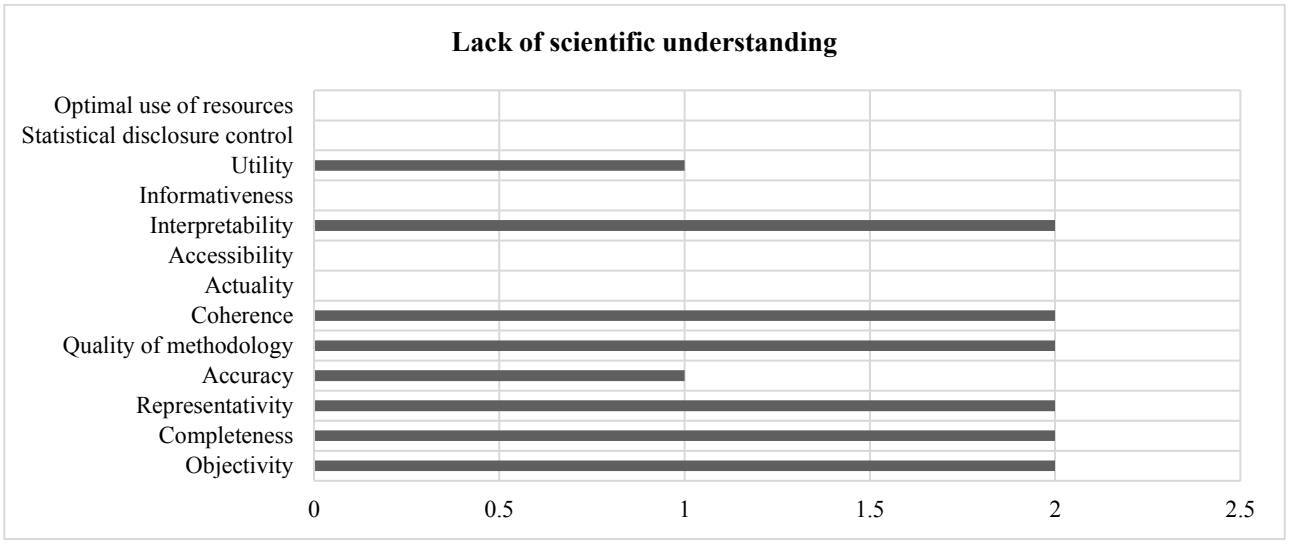

Fig. 1. **To what extent the lack of scientific understanding is typical for data quality dimensions, median values of experts' assessments**

Source: authors' calculations based on the experts' survey results

Judging by the experts' assessment (the median values), **the ambivalent understanding** is typical for the following data quality dimensions: interpretability, coherence, quality of methodology. Experts' opinions differ for the following data quality dimensions: data objectivity, accessibility and utility (see Fig.2).

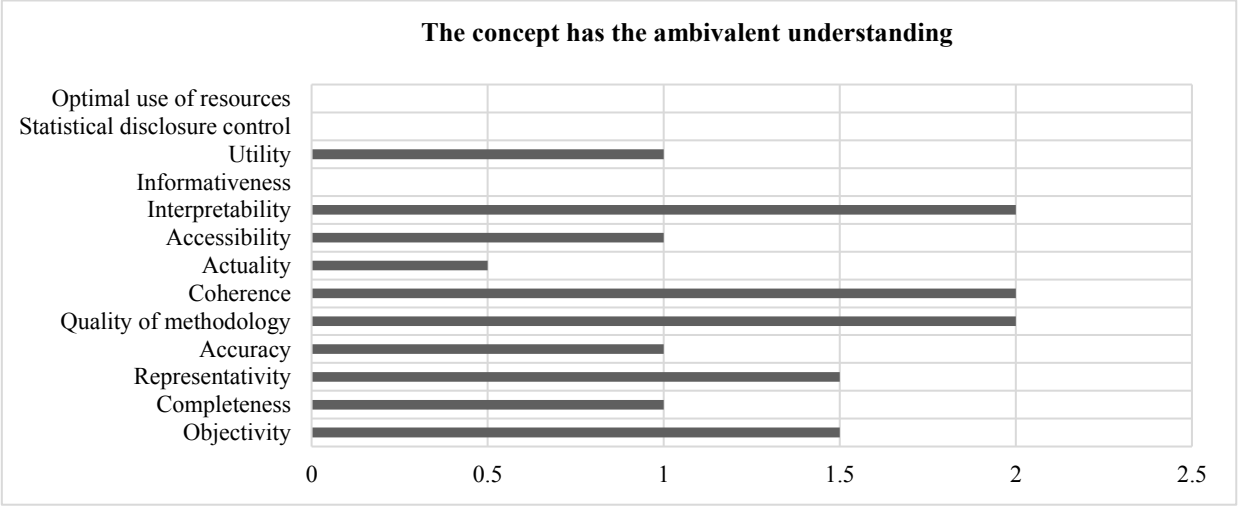

Fig. 2. **To what extent the ambivalent understanding is typical for data quality dimensions, median values of experts' assessments**

Source: authors' calculations based on the experts' survey results

In experts' view **the insufficient methodological support for the assessment of data quality dimensions** is typical for coherenece, quality of methodology, accuracy, representativity and completeness (see Fig.3).

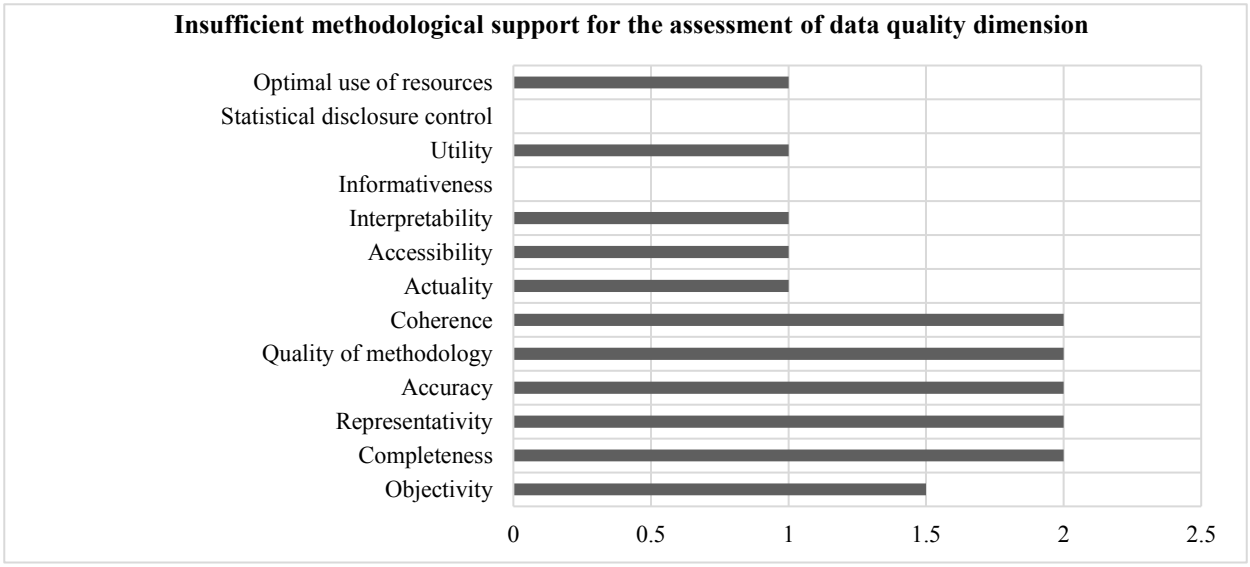

Fig. 3. **To what extent the insufficient methodological support is typical for the assessment of data quality dimensions, median values of experts' assessments**

Source: authors' calculations based on the experts' survey results

According to experts' opinion, **too large variety of methods and the resulting diversity of evaluation results** is typical for data interpretability, coherence (see Fig.4).

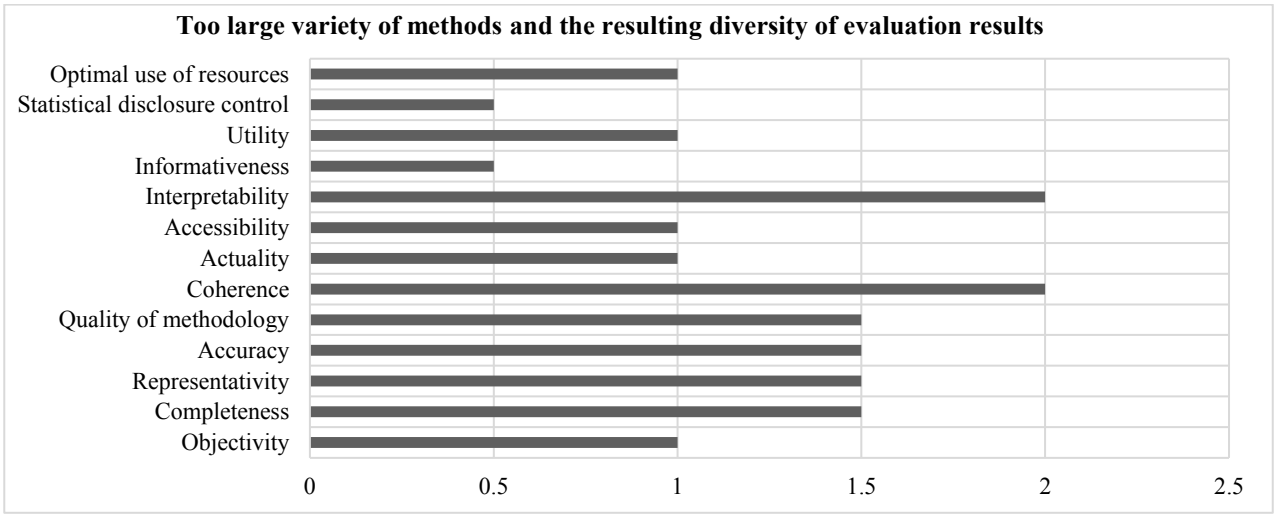

Fig. 4. **To what extent too large variety of methods and the resulting diversity of evaluation results is typical for the assessment of data quality dimensions, median values of experts' assessments**

Source: authors' calculations based on the experts' survey results

Based on experts' assessments, **only qualitative assessment for data quality dimension is available** for the following data quality dimensions: interpretability, accuracy and representativity (see Fig. 5).

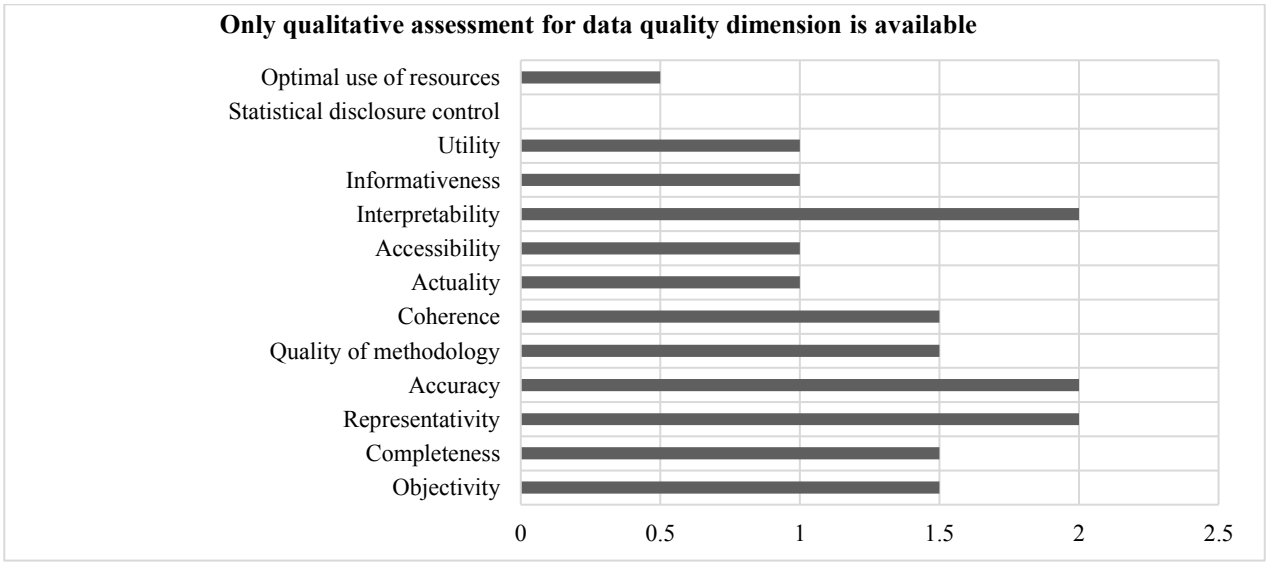

Fig. 5. **To what extent only qualitative assessment for data quality assessment is typical for data quality dimensions, median values of experts' assessments**

Source: authors' calculations based on the experts' survey results

According the experts' assessment, **insufficient quality of assessment methods of data quality dimensions** is typical for interpretability, quality of methodology, accuracy and representativity (see Fig. 6).

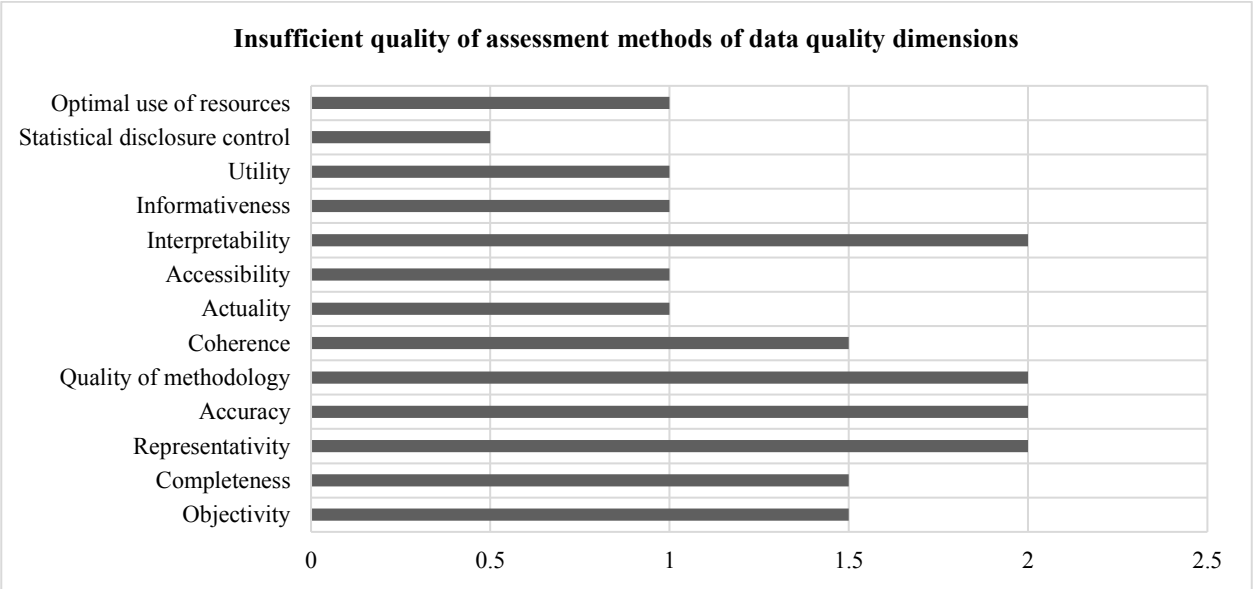

Fig. 6. **To what extent insufficient quality of assessment methods of data quality dimensions is typical for data quality dimensions, median values of experts' assessments**

Source: authors' calculations based on the experts' survey results

Main conclusions based on experts' survey results. Gathering and analysis of experts' survey results gives and opportunity to identify shortcoming of data quality dimensions**.** Modal values of experts' assessment on shortcomings of data quality dimensions are summarized in Table 3. After summarizing experts' survey results, authors found the most problematic data quality dimensions: *data objectivity, completeness, representativity, accuracy, quality of methodology, coherence* and *data interpretability*.

Table 3.

Shortcomings of data quality dimensions, modal values of experts' evaluations

	Lack of scientific understanding	The concept has the ambivalent understanding	Insufficient methodological support for the assessment of data quality dimension	Too large variety of methods and the resulting diversity of evaluation results	Only qualitative assessment for data quality dimension is available	Insufficient quality of assessment methods of data quality dimensions
Objectivity	2	1 un 2	2	2	2	2
Completeness	2	1	2	2	2	2
Reprezentativity	2	2	2	2	2	2
Accuracy	2	1	2	2	2	2
Quality of methodology	2	2	2	1 un 2	2	2
Coherence	2	2	2	2	2	2
Actuality	0	0	1	0 un 1 un 2	1	1
Accessibility	0	0 un 1 un 2	0	1	1	1
Interpretability	2	2	1	2	2	2
Informativeness	0	0	0	0	1	1
Utility	1	0 un 1 un 2	1	1	1	1
Statistical disclosure control	0	0	0	0	0	1
Optimal use of resources	0	0	1	0 un 1 un 2	0	0 un 1 un 2

Source: authors' calculations based on the experts' survey results

Scientific definitions and explanations should be streamlined and clarified, mainly for the following dimensions: *data objectivity, quality of methodology, data coherence* and *interpretability*. Assessment methodology should be developed for data *completeness, accuracy, representativity, quality of methodology, coherence* and *interpretability*. Both scientific definitions and assessment methodology should be developed for *quality of methodology, coherence* and *interpretability*.

Conclusions, Proposals, Recommendations

The scientific literature provides too many ways to describe data quality dimensions and data quality concept which causes confusion and uncertainty in data quality assessment and reduces reliability of results of applied data quality evaluation methods.

The scientific literature does not offer a complex methodology for assessing data quality in general, but proposes methodology for assessing the quality on individual dimension level.

In the view of experts, assessment methodology should be improved for data completeness, accuracy, representatively, quality of methodology, data coherence and data interpretability. Scientific definitions and explanations should be streamlined and clarified, mainly for the following dimensions: data objectivity, quality of methodology, data coherence and interpretability.

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ELECTRONIC MONEY AND ELECTRONIC MONEY INSTITUTIONS: RECENT DEVELOPMENT AND ISSUES

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Abstract. Innovation in payments is driven by competition, facilitated by technology, and will usually deliver value to consumers and merchants. In the last few years, the most successful innovations in payments have been those that offer payments in areas that were either un-served or under-served, such as online and mobile commerce, or those that offer access to customers who were previously excluded, or payments within new business or social interactions. Cash continues to be gradually replaced by digital money. This could potentially result in gains in productivity and economic welfare. At the same time, electronic money use can hide serious risks that could turn into significant financial losses for its users, and negative impact on monetary policy. The aim of this research is to identify types of electronic money and their development possibilities in the future, analyzing the legal regulation and considering a necessity of a new legal regulation by identifying the risks. Main result: A significant development of electronic money could have implications for the monetary policy strategy and the control of the operational target; The rights and obligations on the part of the respective participants in an electronic money system must be clearly defined and disclosed; An electronic money system must maintain adequate technical, organizational and procedural safeguards to prevent, contain, and detect threats to the security of the system; Protection against criminal abuse, such as money laundering and fraud, must be taken into account when designing and implementing electronic money systems. So, regulatory initiative may be needed to mitigate the potential risks.

Key words: *electronic money, electronic money directive, electronic money institution.*

JEL code: K02, O03

Introduction

Our life has been changed by the new technologies and money is not an exception. The traditional ways of the monetary exchange have developed into electronic ones. Nowadays, electronic money has become increasingly popular among people around the world. The amount of electronic money issued in the euro area in the period 2008 – 2015 has rise from 1.2 to 7.1 billion euro (European Central Bank, 2016). Consumers will adopt digital or contactless payments over cash and digital wallets will start to supersede the physical wallet. The era of electronic money will soon be upon us.

The rise of electronic money, it is clear, is no anomaly in historical terms and indeed may be regarded as an entirely natural development in the context of today's rapidly globalizing world economy (Cohen B.J., 2001). The prevalent perception about money today is as a practical and neutral means of circulation which allows other things (sale/purchase) to function. Money is a means of exchange, it is storage of value (unless inflation is too high), and it establishes a principle of equivalence (by which the value of different things can be compared). This purely utilitarian definition of money dominates in both the population and among scholars. This perception is in no small part upheld and furthered by the historical abstraction of money where the evolution of exchange objects has gone from everyday material objects, to coins, to credit notes, and now to digits on a screen or information stored on a card. Money now seems to have

conclusively separated itself from its embedding in specific historical and national cultures and its grounding in material production (Thomsen J.B., Jacobsen S.G., Christiansen Ch.O., Thorup M., 2014).

With cybercash (electronic money) – the new type of money that circulates on the in several forms – this is precisely what we get: a revolution in the support structure of market exchanges and in the dynamic of the exchange process itself (Guttmann R., 2002). The rise of a global finance market and the digitalization of money seem to have 'liberated' money from its non-monetary connotations (Thomsen J.B., Jacobsen S.G., Christiansen Ch.O., Thorup M., 2014).

The development and use of electronic money are still in their early stages. The continued development of electronic money may contribute to improving the efficiency of the banking and payment system and to reducing the cost of retail transactions nationally and internationally. This could potentially result in gains in productivity and economic welfare. At the same time, should recognise that along with the benefits, electronic money activities carry risks for users and monetary policy, and these risks must be balanced against the benefits. In this article are explored types of electronic money, analyzed regulation of electronic money in the European Union and identified variety of risks that may be faced in electronic money transactions.

Research Results and Discussion

1. Types of Electronic Money

Electronic money, or e-money (also variously labelled digital currency, computer money, or e-cash), is any electronic payment media – any material, device, or system, that conduct payment via the transfer of electromagnetically stored information. E- money may be "currency" in a physical "wallet" like a smart card or token, but it generally exists as account data on some electronic storage device (Fullenkamp C. & Nsouli S.M., 2004). Electronic money presently comes in two basic forms, smart cards and network money. Both are based on encrypted strings of digits – information coded into series of zeros and ones – that can be transmitted and processed electronically. Smart cards, a technological descendant of the ubiquitous credit card, have an embedded microprocessor (a chip) that is loaded with a monetary value. Versions of the smart card (or 'electronic purse') range from simple debit cards, which are typically usable only for a single purpose and may require online authorization for value transfer, to more sophisticated stored-value devices that are reloadable, can be used for multiple purposes, and are off-line capable. Network money in computer hard drives and consists of diverse software products that allow the transfer of purchasing power across electronic networks (Cohen B.J., 2001).

Electronic money systems are not just simple payments systems but also railway tickets, point cards, membership identifications, with many capabilities attached and a very high degree of usability. In other words, the growth of electronic money is not only a product of the convenience and rapidity as a means of payment, but also to the merits it provides to issuers and their business partners. Additionally, as the benefits of electronic money expand, electronic money is becoming more multifaceted as point programs, such as airline mileage programs, are being tied to electronic money, and, on the technical side, electronic money is no longer limited to IC cards but is being integrated into mobile phones and electronic money will even become an effective means of payment over the internet (Sugiura N., 2009).

2. Regulation of Electronic Money

Directive 2009/110/EC of the European Parliament and Council of 16 September 2009 on the taking up, pursuit and prudential supervision of the business of electronic money institutions amending Directives 2005/60/EC and 2006/48/EC and repealing Directive 2000/46/EC (European Parliament, 2009) established a new legal basis for e-money issuance in the European Union. The regulation of electronic money was adopted in response to the emergence of new pre-paid

electronic payment products and was intended to create a clear legal framework designed to strengthen the internal market while ensuring an adequate level of prudential supervision. The Directive was adopted with the objective of removing barriers to market entry and facilitating the taking up and pursuit of the business of electronic money issuance, because the rules to which electronic money institutions are subject need to be reviewed so as to ensure a level playing field for all payment services providers. There are three objectives, to: 1) reflect technological changes, and promote innovation in the design of new, secure e-money products; 2) reduce barriers to entry and increase competition in the market; 3) modernise the rules for e-money issuers and align them with existing rules for payment service providers (The Treasury of the United Kingdom, 2011).

This Directive introduces a new definition of electronic money. According to Article 2(2) of the Directive, "electronic money" means "electronically, including magnetically, stored monetary value as represented by a claim on the issuer which is issued on receipt of funds for the purpose of making payment transactions […], and which is accepted by a natural or legal person other than the electronic money issuer". The definition of electronic money cover electronic money whether it is held on a payment device in the electronic money holder's possession or stored remotely at a server and managed by the electronic money holder through a specific account for electronic money. The definition is wide enough to avoid hampering technological innovation and to cover not only all the electronic money products available today in the market but also those products which could be developed in the future (European Parliament, 2009). However, the Directive does not apply to the situation where a mobile phone or other digital network subscriber purchases digital goods or services and pays the network operator directly and there is neither a direct payment relationship nor a direct debtor-creditor relationship between the network subscriber and any third-party supplier of goods or services delivered as part of the transaction (Kroes Q.R., 2010).

Article 2(1) of the Directive defines an "electronic money institution" as a legal person that has been granted authorisation to issue e-money. Credit institutions, as well as other financial and non-financial institutions, may issue e-money. According to Article 1 (1) of the Directive the Member States shall recognise the following categories of electronic money issuer:

(a) credit institutions;

(b) electronic money institutions;

(c) post office giro institutions which are entitled under national law to issue electronic money;

(d) the European Central Bank and national central banks when not acting in their capacity as monetary authority or other public authorities;

(e) Member States or their regional or local authorities when acting in their capacity as public authorities.

It is recognised that electronic money institutions distribute electronic money, including by selling or reselling electronic money products to the public, providing a means of distributing electronic money to customers, or of redeeming electronic money on the request of customers or of topping up customers' electronic money products, through natural or legal persons on their behalf, according to the requirements of their respective business models.

The Directive includes a new prudential regime, ensuring greater consistency between prudential requirements of electronic money institutions and payment institutions. There are requirements for the taking up, pursuit and prudential supervision of the business of electronic money institutions, and regulation of issuance and redemption of electronic money. The Directive also contains an updated waiver regime, as well as updated antimony laundering rules. The Directive also clarifies the application of redemption requirements and gives consumers the right to claim back their electronic money at any moment under certain conditions. There are also requirements in the Directive for electronic

money issuers to have sound and prudent management, administrative and accounting procedures and adequate internal control mechanisms (Kroes Q.R., 2010).

3. Types of Risks

The rapid development of new electronic money, offers society many potential benefits even as it poses new types of risk. Most critical is the issue of **trust**: how to command confidence in any new form of money. According to Knapp's 'state theory of money', all money is a product of law and dependent for its validity on formal ordinances, such as legaltender laws (specifying what currency must be accepted in payment of a debt) and public-receivability provisions (specifying what currency may be used to pay taxes or satisfy other contractual obligations to the state). But that is an unduly restrictive view of actual usage, which in fact admits of a much wider range of influences. At its most fundamental money is a social institution, resting on the reciprocal faith of a critical mass of transactors. Confidence ultimately is socially constructed, based implicitly or explicitly on an inter subjective under-standing about an instrument's future value and usability, and may well reject nothing more than the gradual accumulation of competitive market practice (Cohen B.J., 2001). The main risk is that the emission of electronic money is guaranteed only by the issuer, the state does not give any guarantees. Another risk is that electronic money exists only in the framework of the system in which they were issued. To exchange one type of e-money to another you can use reliable and trusted exchange service. And finally, in case of physical destruction of the storage device, it is impossible to restore the monetary value of e-money.

Currency d**eterritorialization** is part and parcel of the accelerating globalization of world economic affairs. Driven by deregulation as well as the pressures of competition and technological innovation, financial and monetary systems have become increasingly integrated, effectively broadening the array of currency choice for many transactors and investors. Despite government efforts to preserve traditional monetary monopolies, currencies now compete directly for market confidence and allegiance. As a result, monetary domains today diverge more and more sharply from the legal jurisdictions of states and are defined more by the networks of market actors that use them than by the territorial frontiers of the governments that issue them (Cohen B.J., 2001).

Bidirectional scheme virtual currencies have the highest risk potential, precisely due to their convertible nature. As a result, bidirectional **virtual currencies** can pose added risks to users and other market participants, for instance in the forms of volatility, anonymity, and fraudulent market participants. If their adoption and transaction volume would grow, they could threaten overall market and price stability, thus posing a risk to markets and their regulators. Incentive for regulation of this type of virtual currency can be found in both stakeholder protection and market protection. First, users of virtual currencies could be exposed to risks associated with the growth of a virtual currency. For instance, if a closed scheme virtual currency would develop into a unidirectional or even a bidirectional virtual currency, the user of such virtual currency would be exposed to risks that would not have been present initially. A second important risk to users relates to losses due to fraudulent or non-genuine exchanges, wallet or exchange theft or hacking, or identity theft. The European Banking Authority (EBA) has conducted a risk assessment exercise, in which it highly ranked these types of risks, meaning they have a high probability to materialize and a high potential impact. In addition, a risk assessment conducted for the Bitcoin Foundation addressed these issues, as did a similar exercise by the Financial Action Task Force (FATF). Third, virtual currencies – like legal tender – can experience value fluctuations, which can result in the user incurring losses. The EBA ranks this risk as high, since virtual currency markets are relatively opaque, and prices can be more easily manipulated than on regulated legal tender markets, as does the ECB. Last, also other behavior could pose risks to users. These can include intermediaries or counterparties failing to meet contractual settlement obligations, lack of acceptance or convertibility of virtual currencies, incorrect debiting, inability to access wallet or exchange services, and price manipulation. The ECB in this regard also points: lack of transparency, lack of continuity, potential illiquidity,

and high IT and network dependence. An important element of this risk is that virtual currencies often allow anonymous, or at least pseudonymous, transactions (Vandezande N., 2017). From a regulatory perspective, the rise of virtual currencies has the potential to change the dynamics of currency flows within an economy making existing regulations at best obsolete, at worst a systemic risk. As such, there is a need to explore the impacts of these technological innovations on monetary thought, monetary policy and the types of policy interventions that are required (Llewellyn D.W.Th., Vernet A., Gann D.M., 2016).

The increasing role of non-banks in these emerging payment arrangements have shifted the traditional risks associated with payments activity, such as credit, liquidity, and settlement risk. Institutions, whose core functions and competencies do not necessarily pre-dispose them to comprehensive understanding or adequate management of such issues, now assume the responsibility. Moreover, the growth in the usage of payment instruments which are processed online and via open networks and characterized by real-time transfer of value has introduced a different business model. Whereas previously, banks were responsible for managing communication and processing of customer payment transactions, with this new model all the parties involved communicate with each other and interact freely. It therefore is a more complex structure with many points of contact with the sharing of sensitive data at various stages along the processing chain. This introduces new risks in terms of **data security and data (privacy) protection** (Sub-committee of the Payments System Council, 2012). Considering privacy, digital money will result in the creation of vast amounts of data that could be more invasive of individual privacy than existing technologies, potentially requiring new approaches. On the other hand, the data that digital money generates can be used to confirm the identity of individuals and firms. There is a need to understand and develop privacy rules that are protective of individuals and businesses, but also allows individuals, firms and governments to use the data to prove identity and create insight enabling them to refine their operations and deliver better services to citizens and customers (Llewellyn D.W.Th., Vernet A., Gann D.M., 2016).

In the fast developing technical world, the risk of **counterfeit and fraud** can hardly be excluded. This problem is less significant for schemes in which electronic money transactions are processed in a way similar to that in which sight deposits are handled by credit institutions. If the scheme is based on a book-entry principle, according to which each loading and, in the end, each payment operation triggers a debit or credit position in the account of the issuer(s), criminal attacks can be detected at an early stage and counter-measures can be taken. By contrast, if electronic money units are transferable from customer to customer without these transactions being subsequently recorded by the issuer or a clearing system, the systems might entail a higher degree of operational risk, since it is not possible to have a complete audit trail of transactions at all times, and the source and exact quantity of any counterfeit electronic money or false value triggered by security deficiencies might not be known. Even those schemes which do not permit customer-to-customer transactions may truncate or amalgamate the data transferred to the issuer or clearing system, which would result in an incomplete audit trail. Another area of criminal abuse associated with electronic money schemes relates to money laundering and tax evasion. Should electronic money schemes offer the possibility of executing anonymous transfers of large sums of money, they could be increasingly used for such criminal purposes. In fact, it cannot be excluded that market forces alone might foster the development of those schemes whose features are more “attractive” for money laundering purposes (such as anonymity of transactions, the possibility of making customer-to-customer transactions, the impossibility of tracing individual transactions) (European Central Bank, 1998).

With regards to fraud prevention, in addition to system security, there are also a number of problems related to the strengthening of penal provisions that address fraud. Because the current penal regulation regarding electromagnetic recording has not been addressed from this viewpoint, the kinds of fraud that are likely to arise from an electronic money system which allows the exchange of electronic value from an outside network should be once again reexamined with this frame of reference in mind (Sugiura N., 2009).

The enabling infrastructure comprises the information and communication technology development and financial regulatory characteristics that underpins the deployment and operation of digital money technologies and services. This includes the provision, availability and affordability of information and communication technologies within a country. For instance, levels of mobile network coverage and broadband provision influence readiness to adopt - when mobile network coverage is good, but broadband provision poor, digital money technologies based upon mobile devices may be readily adopted. Similarly, if access to the internet, smartphones or mobile telephony is costly in relation to the average wage, then the infrastructure becomes less available for both companies and individuals to access. The reduces the readiness of a country for digital money adoption. An economy also needs a population with the skills to be able to use these technologies; if the population is not educated on how to use ICT's, then not only will the adoption of digital money be hindered through low consumer adoption, but there will be less skilled staff able to support the provision of digital money solutions. In consequence, the development of the ICT infrastructure is an important enabling characteristic for digital money (Llewellyn D.W.Th., Vernet A., Gann D.M., 2016).

If electronic money is issued through the conversion of banknotes or sight deposits, it does not change the money supply and price stability is not endangered. However, if electronic money is issued as a consequence of credit, private issuers have incentives to supply additional amounts of electronic money as long as the difference between the interest charged on the credit and the one paid on electronic money covers the credit risk premium, the provision of the payment service, and possibly also the cost of refinancing if redeemability is required. Given the low marginal cost of producing electronic money, its issuance could in principle proceed until the interest rate charged on the credit extended for the provision of electronic money is equal to the credit risk premium. This, by lowering the level of interest rates, could in turn endanger the maintenance of price stability. The question of **overissue** of electronic money is also related to the question of whether electronic money could endanger the unit-of-account role as incorporated in central bank money. If, in the absence of any regulation, certain electronic money products were to spread at a rapid rate, market views about the creditworthiness of issuers could be affected and electronic money products from different issuers could start to be traded at varying exchange rates. So, electronic money is likely to have significant implications for monetary policy in the future, and thus regards it as important to establish clear rules on the conditions under which electronic money can be issued (European central Bank, 1998).

Finally, when thinking about a money supply scheme based on electronic money, it is important to think about how the role of the central bank, as the **monetary policy** authority, will change. Some argue that if the monopoly on money supply technologies were to collapse as a result of the emergence of electronic money, monetary policies may no longer function. We do not adhere to this view. What the central bank must do to control the nominal interest rate is to act as the price leader in the market for the settlement medium. The central bank must be able to redeem money using the money it has issued, and there must be no risk that it will become unable to make payments. That is, the public must have confidence that it is impossible for the bank to fail to enact policies to which it is committed (Iwamura M., Watanabe T., 2006).

Conclusions

The commercial and technological environment for electronic money is changing rapidly, making it difficult to develop policy that is both timely and appropriate. The anticipated era of electronic money, though an entirely natural development in the context of today's rapidly globalizing world economy, will indeed have a profound impact on the effectiveness of monetary policy. The world of unrestricted currency competition could, for better or for worse, soon become reality. Whether it concerns security and privacy, risk management or control over money creation, electronic

money gives rise to difficult and generic problems in the form of qualitatively new market failures that only the visible hand of the government and the Central bank as regulators can confront effectively.

E-money Directive forms the legal framework for protecting consumers in transactions with payment services and e-money providers. However, the unclear scope of applicability of that legal framework could lead to legal uncertainty. It is clear that these legal frameworks can, in their current form, not apply to the different types of virtual currencies or virtual currency service providers. More clarity is needed on the precise legal status of virtual currencies, and more regulatory initiative may be needed to mitigate the other potential risks. The current regulation leaves a number of questions unanswered, for instance regarding its precise scope and the registration or licensing procedure, the control mechanism and data privacy.

In the near term, modernization of electronic money regulation is preferable. The issuance of electronic money is likely to have significant implications for monetary policy in the future. Above all, it must be ensured that the price stability and the unit of account function of money are not endangered. A significant development of electronic money could have implications for the monetary policy strategy and the control of the operational target. A number of additional regulatory concerns, (i.e., the efficient functioning of payment systems and confidence in payment instruments, the protection of customers and merchants, the stability of financial markets, and protection against criminal abuse) also have to be taken into account. The rights and obligations on the part of the respective participants (customers, merchants, issuers, and operators) in an electronic money system must be clearly defined and disclosed. An electronic money system must maintain adequate technical, organizational and procedural safeguards to prevent, contain, and detect threats to the security of the system, particularly the threat of counterfeits. Protection against criminal abuse, such as money laundering, must be taken into account when designing and implementing electronic money systems.

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THE PRIVATE PLACEMENT OF CONVERTIBLE DEBT: A FEW OBSERVATIONS FROM THE U.S. MARKET

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Abstract. Using a sample of over five hundred convertible debt issues carried out by non-financial American firms between 2004 and 2014, this paper identifies the motives for selling convertible bonds through private offerings by companies in good financial standing. The empirical examination, including the analysis of main issue parameters and selected proxies for financial performance and growth opportunities of the issuers, indicates that profitable firms that issue private convertibles are medium, undervalued companies which are likely to raise hybrid capital as a cheaper substitute for common equity to finance their investment process. They presumably place convertible debt in the private market in order to speed up raising funds, to avoid high flotation costs of selling new securities publicly and to control their future shareholders structure.

Key words: convertible debt financing, corporate finance, debt policy, private convertibles, public convertibles

JEL code: G23, G30, G32.

Introduction

To sell debt privately or to place it in the public market – this question seems to be crucial for managers trying to reinforce their companies in external capital. A proper decision to be made in this area may be dependent on a few factors. Perhaps it is the time of due diligence process that is critical for issuers looking to forward to the access to new capital. Maybe these are new investment plans that issuers are willing to hide from their rival firms. It also may be issuers' financial performance that influences a marketplace of debt issuance. Solving all mentioned dilemmas and choosing an appropriate place for debt sales enables companies to increase their market capitalization and let their stakeholders look ahead to firms' prospects with optimism.

What if a company tries to sell fixed-income-like securities with strong equity characteristics, such as convertible bonds? These instruments are simply ordinary corporate bonds with an embedded call option on the issuers' common stock. Due to a detached right to exchange debt for a fixed number of the issuers' ordinary shares at the option of the bondholders, convertible debt is usually considered as a form of delayed equity (Billingsley and Smith, 1996; Bancel and Mittoo 2004). In the model developed by Stein (1992), the issuance of convertibles can help undervalued firms to raise their equity capital through the backdoor at a later time and at the more favorable conditions in comparison to the issuance of common stock. What is more, until conversion companies can benefit from a cheaper and possibly non-refundable source of external finance as compared to straight debt since an equity component of convertibles entitles the bondholders to capture any increase in the issuers' market value if they decide to convert debt into equity.

Although the motives for choosing a marketplace of straight debt placements have been examined quite profoundly so far, the exact reasons for selling convertible debt either in the private or in the public market are still ambiguous. Regarding the hybrid nature of convertibles it is important to find out whether a debt component of such instruments does determine managers' decisions of raising capital from private or public sources. In other words, it is worth explaining whether decisions where to sell convertibles are similar to decisions about a place of selling ordinary corporate bonds

without conversion option or they are made under completely different rules? Finding a proper answer for all these questions might be crucial for specialists providing professional advisory support for debt issuances, such as commercial or investment banks, as well as for companies looking for alternative financial sources which can substitute straight debt or equity. This seems to be particular important insofar as the existing literature touches on a problem of a marketplace of hybrid debt issuance rather incidentally. All research applied to private and public placement of convertible bonds were only a part of a broader examination on straight debt and equity issuances and there is lack of research regarding convertible debt itself (Huang and Ramirez, 2010; Gomes and Philips, 2012). Furthermore, all conclusions to be drawn on convertibles may be obsolete these days and there is an urgent need to bring previous findings up to date (most actual samples cover only 1991–2004 and 1995–2003). Finally, there is no research concerning the private market of hybrid debt and hence the reasons that drive companies to borrow money from the private sources are still unclear. This paper tries to fill all of the research gaps outlined above.

The intent of the article is to identify the motives for placing convertibles in the private market by non-financial American companies in good financial performance. It is aimed to find out why profitable companies raise hybrid capital from a small group of dedicated lenders rather than search for funds in the public market. Although the following research concentrates only on convertible bonds issued in the American market – the largest hybrid debt market in the world – we can cautiously presume that the findings from this article may be meaningful also for firms from countries in other regions. It is true that each market has its own specificity and can provide unique law regulations facilitating firms to sell debt privately (Rule 144A in the US, for instance), but it is possible that the reasons for placing convertibles through private offerings might be similar across different markets and are related to companies' financial performance and their investment opportunities.

If this article focuses only on profitable issuers of convertibles, the reasons for getting funds from private sources are obviously not driven by their poor financial performance, as it was the case in many papers, e.g., Fenn (2000), Denis and Mihov (2003), Huang and Ramirez (2010) and Arena (2010). Taking the hybrid nature of convertibles into account, we can then suppose that firms may issue bonds with an embedded conversion option for two reasons. First, they presumably try to avoid the issuance of undervalued common stock and, close to Stein (1992), they use convertibles to increase their equity capital at a higher price and at a lower dilution at some point in the future. Secondly, perhaps they intend to reduce high flotation costs of selling bonds publicly, as suggested by Blackwell and Kidwell (1988) and Arena (2010).

The idea behind selling private debt instead of placing it publicly may be as follows. We cannot rule out that by borrowing capital from a small group of dedicated lenders, companies are willing to control their future shareholders structure as they assume that bondholders will exercise their right and convert debt into equity. However, the only way to incentivize investors to exchange bonds for companies' common stock is to induce a firm market value to grow. This can be achieved by exercising valuable investment options which, according to Mayers (1998), can be effectively financed through convertible bonds. Yosha (1995) and Dhaliwal et al. (2004) provide evidence that firms with high future growth opportunities are particularly interested in raising debt from private sources, perhaps in order to avoid costs of information disclosure if they decided to place bonds in the public market, and of revealing the information about valuable investment projects to their rival firms. Since it is crucial for most firms to start new investments without any delay, profitable companies may decide to issue private convertibles to reduce the time of due diligence process and thereby speeding up raising capital (Fenn, 2000; Huang and Ramirez, 2010). Putting all abovementioned predictions together, we can hypothesize that the issuers of private convertibles are relatively small, undervalued firms which raise hybrid capital as a cheaper substitute for common equity to finance their investment process.

The final sample for the research comprises 529 private issues of straight, callable and puttable convertible bonds carried out in the private market between 2004 and 2014 by manufacturing and service companies from the United States. All necessary data for the analysis was taken from the Bloomberg Database from the most recent financial reports from the preceding year of convertibles issuance. In order to verify the main hypothesis, a few parameters of issue (issue size, maturity, conversion period, coupon, conversion price, conversion ratio and initial conversion premium) and proxies for financial performance and investment opportunities of the issuers are tested. Selected indicators describe firms' size ("Total assets"); leverage ("Debt/Assets", "Debt/Equity"); profitability ("Operating margin"); growth opportunities ("R&D/Assets", "CAPEX/Assets", "Tobin's q Ratio); and costs of raising capital ("Weighted average cost of equity", "Weighted average cost of debt (after tax)").

The research is divided into two parts. The former contains a comparison of financial situation and terms of issues carried out by profitable and non-profitable issuers of private convertibles in order to grasp possible motives for placing hybrid debt in the private market by firms in good financial standing. A division for "profitable" and "non-profitable" firms based on their return on equity which is considered as a good proxy for firm performance, i.e., companies with positive ROE are considered as "profitable" and firms with negative ROE are classified for "non-profitable" group. The second part of the research applies only to profitable companies and encompasses a correlation between profitable issuers of private and public convertibles to find potential reasons for selling debt in the private instead of public market. Except for simple descriptive statistics methods, both logistic regression and classification tree models are employed to indicate the set of factors which may determine the issuance of private convertibles done by profitable companies.

The remainder of this article is organized as follows. Section 1 – the introduction – identifies key ideas and aims of the paper, provides a brief literature review and describes the sample and research methods applied. Section 2 sets forth the research results and discussion of key findings. Section 3 contains concluding comments.

Research Results and Discussion

In the first step both profitable and non-profitable issuers of private convertibles were correlated together in order to compare selected indicator describing their economic performance and parameters of issues which were carried out by these firms. Note that values of all analyzed indicators strongly diverge from a normal distribution so their expected values are closer to their median rather than to their mean values.

The results indicate that both types of firms carry out issues of similar size (amount to approx. 20% of their total assets; differences statistically non-significant) and with comparable maturity and conversion period (approx. 5 years; differences statistically non-significant) (table 1). Understandably, profitable firms sell convertibles at nearly three times higher conversion price than non-profitable companies ($19.1 to $7.6) which results in the issuances with a notably lower conversion ratio (50 to 124). Furthermore, the outcomes show that private convertibles used by companies with good financial performance are issued with a slightly lower initial conversion premium than their non-profitable counterparts (26% to 32%). It may suggest that these entities are willing to increase their equity capital soon after convertibles issuance and they therefore set conversion price on relatively low levels. We should also mention that all private convertibles seem to be issued with low coupons, which may come as a surprise for non-profitable issuers (5,0% compared to 3,5% for profitable companies), but exactly for that reason convertibles are known as a "debt sweetener" since their embedded call option helps issuers to reduce their financial costs.

Table 1

Terms of issue of private convertibles carried out by profitable and non-profitable firms

Variable	Firm type	n	Mean	Median	Standard deviation	p-value
Maturity Period (in days)	non-profitable	279	1847.272	1827.000	939.621	0.808
	profitable	250	2091.348	1826.000	1646.870	
Conversion Period (in days)	non-profitable	279	1539.032	1822.000	2673.016	0.910
	profitable	250	1728.476	1815.500	3056.035	
Coupon (in %)	non-profitable	279	5.534	5.000	3.711	0.010**
	profitable	250	5.023	3.500	4.344	
Conversion Price (in USD)	non-profitable	269	13.168	7.630	17.957	<0.0001***
	profitable	241	43.485	19.122	165.131	
Conversion Ratio	non-profitable	265	1630.440	124.008	6101.707	<0.0001***
	profitable	236	3582.980	50.278	12410.752	
Initial Conversion Premium (in %)	non-profitable	124	33.383	32.280	17.826	0.001***
	profitable	144	27.775	26.000	11.320	
Issue/Assets	non-profitable	275	3.666	0.226	33.990	0.654
	profitable	249	4.209	0.222	56.366	

p-value – the probability of the Mann-Whitney U test; ** significant at the 0.05 level; *** significant at the 0.01 level.

Source: author's calculations based on the Bloomberg Database.

The analysis of selected economic indicators show that profitable issuers of private convertibles are twice as big as non-profitable companies ($434 million to $250 million) and they are slightly more leveraged in relation to their total assets (62% to 52%) (table 2). However, they seem to have more favorable capital structure with significantly lower debt-to-equity ratio (36% to 83%). It also appears that non-profitable firms generate huge losses already at an operational level – their average operating margin amounts to -21.6% as compared to 6.8% for profitable companies. As for proxies for growth opportunities, it turns out that both groups of issuers may be actively engaged in realizing new investment projects; this is evidenced by relatively high Tobin's q ratio ("Q Ratio" over 2; differences statistically non-significant) capital expenditures to their total assets (approx. 2%) and their research and development expenditures in relation to their total assets ("R&D/Assets" = 4.2% for profitable and 9.2% for non-profitable firms). In addition, both profitable and non-profitable issuers of private convertible debt have similar costs of raising equity (about 9.5%), but weighted average cost of debt for companies with good performance is slightly lower (2.14% to 2.45%).

Table 2

Profitable and non-profitable issuers of private convertibles

Variable	Firm type	n	Mean	Median	Standard deviation	p-value
Total assets	non-profitable	275	1188.049	249.594	2679.724	0.071*
	profitable	248	.2374,629	433.508	7023.314	
Debt/Assets	non-profitable	276	0.954	0.522	1.985	<0.0001***
	profitable	249	2.262	0.621	5.255	
Debt/Equity	non-profitable	278	1.922	0.829	5.075	<0.0001***
	profitable	250	-0.948	0.356	5.786	
Operating margin	non-profitable	261	-10.171	-0.216	59.422	<0.0001***
	profitable	231	-2.332	0.068	10.167	
R&D/Assets	non-profitable	279	0.148	0.092	0.254	0.004***
	profitable	249	0.209	0.042	0.666	

CAPEX/Assets	non-profitable	279	0.063	0.027	0.103	0.001***
	profitable	250	0.041	0.021	0.072	
Q Ratio	non-profitable	223	11.544	2.384	39.334	0.431
	profitable	219	17.746	2.177	40.199	
WACC Equity	non-profitable	251	10.845	9.513	5.310	0.053*
	profitable	208	10.136	9.513	3.451	
WACC Debt	non-profitable	261	2.127	2.445	1.156	0.005***
	profitable	223	1.943	2.140	0.944	

p-value – the probability of the Mann-Whitney U test; * significant at the 0.1 level; *** significant at the 0.01 level.

Source: author's calculations based on the Bloomberg Database.

In the second part of the research, the profitable issuers of private convertibles are correlated with the profitable companies selling these instruments in the public market. Both groups are likely to treat hybrid debt as a deferred equity (due to initial conversion premium less than 30%; differences statistically non-significant) and issue it with an average maturity of 5 years (table 3). Furthermore, the issuances placed privately are slightly bigger in relation to companies' total assets (22% for private and 19% for public issues). Finally, firms borrowing capital from private sources appear to be more undervalued as their set conversion price is relatively lower than this parameter in the issuances of public debt ($14 to $20). Having regarded a level of initial conversion premium, it means that profitable and non-profitable firms issue convertibles at the moment when their market share price is $14 and $20, respectively.

Table 3

Terms of issue of private and public convertibles carried out by profitable firms

Variable	Issue type	n	Mean	Median	Standard deviation	p-value
Maturity Period (in days)	Public	315	2409.108	1839.000	1821.987	0.013**
	Private	250	2091.348	1826.000	1646.870	
Conversion Period (in days)	Public	311	2296.219	1836.000	1738.064	<0.0001***
	Private	250	1728.476	1815.500	3056.035	
Coupon (in %)	Public	315	3.627	3.125	2.536	0.025**
	Private	250	5.023	3.500	4.344	
Conversion Price (in USD)	Public	305	43.092	27.560	101.194	<0.0001***
	Private	241	43.485	19.122	165.131	
Conversion Ratio	Public	308	157.885	36.044	527.467	<0.0001***
	Private	236	3582.980	50.278	12410.752	
Initial Conversion Premium (in %)	Public	245	28.307	27.500	11.480	0.501
	Private	144	27.775	26.000	11.320	
Issue/Assets	Public	313	0.329	0.193	0.613	0.065*
	Private	249	4.209	0.222	56.366	

p-value – the probability of the Mann-Whitney U test; * significant at the 0.1 level; ** significant at the 0.05 level; *** significant at the 0.01 level.

Source: author's calculations based on the Bloomberg Database.

In regards the economic aspects of hybrid debt issuers, it appears that companies borrowing money from private sources are 2.5 times smaller than the companies placing convertibles publicly ($434 million to $1068 million) (table 4). Although both groups of firms have similar leverage in relation to their total assets (approx. 59–62%), it turns out that the issuers of private convertibles have more favorable debt-to-equity ratio (36% compared to 76% for the issuers of public convertibles). The proxies for growth opportunities indicate that entities which place convertibles in the private market are likely to invest more capital at the moment of hybrid debt issuance than the issuers which sell debt in the public market (Q Ratio = 2.2 to 1.7 and R&D/Assets = 4.2 to 1.2). Private issuers can also raise external capital at slightly lower costs

(WACC Equity 9.5% compared to 9.6% for public issuers; WACC Debt 2.1% to 2.3%), but these differences are too small to draw any unequivocal conclusion in this area.

Table 4

Proxies for financial performance and growth opportunities of public and private issuers of convertible debt

Variable	Issue type	n	Mean	Median	Standard deviation	p-value
Total Assets	Public	313	3976.668	1067.633	14088.621	<0.0001***
	Private	248	2374.629	433.508	7023.314	
Debt/Assets	Public	315	1.184	0.586	5.484	0.035**
	Private	250	2.468	0.623	6.178	
Debt/Equity	Public	315	-1.037	0.761	19.643	<0.0001***
	Private	250	-0.948	0.356	5.786	
CAPEX/Assets	Public	315	0.044	0.026	0.058	0.005***
	Private	250	0.041	0.021	0.072	
R&D/Assets	Public	315	0.098	0.012	0.327	0.032**
	Private	249	0.209	0.042	0.666	
Q Ratio	Public	270	3.757	1.677	13.046	<0.0001***
	Private	219	17.746	2.177	40.199	
WACC Equity	Public	310	10.269	9.633	2.895	0.112
	Private	208	10.136	9.513	3.451	
WACC Debt	Public	311	2.254	2.289	0.863	<0.0001***
	Private	223	1.943	2.140	0.944	

p-value – the probability of the Mann-Whitney U test; ** significant at the 0.05 level; *** significant at the 0.01 level.

Source: author's calculations based on the Bloomberg Database.

In the next step, logistic regression models have been applied to identify factors which may determine the decision of profitable companies to sell convertible bonds through private offerings (table 5)[1]. It appears that under *ceteris paribus* assumption, if Tobin's q ratio rises by 1, issuers are 1.5% more likely to place convertibles privately and if weighted average cost of debt grows by 1 percentage point, companies are less likely to issue private convertibles by 29%. It can be then concluded that a likelihood of issuing convertible bonds in the private market by profitable firms is higher for entities with higher growth opportunities and lower costs of raising debt.

Table 5

Logistic regression model for issues of private convertibles carried out by profitable firms

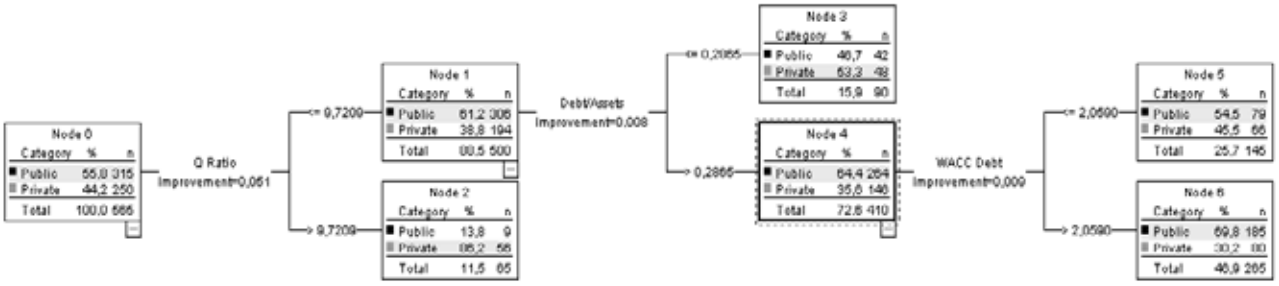
Variable	B	S(B)	Wald Statistic	p-value	exp(B)
Q Ratio	0.015	0.008	3.347	0.067*	1.015
WACC Debt	-0.345	0.109	0.955	0.002***	0.708
Constant	0.335	0.257	1.695	0.193	1.398
R^2_{Nag}			0.059		
n			565		

B – the non-standardized regression coefficient; S(B) – coefficient B estimation error B; R^2_{Nag} – Nagelkerke R-square; * significant at the 0.1 level; *** significant at the 0.01 level.

Source: author's calculations based on the Bloomberg Database.

[1] Six independent variables which were statistically significant based on the results of Mann-Whitney U test in table 4 were used in the logistic regression model: (1) Debt/Assets, (2) Debt/Equity, (3) CAPEX/Assets, (4) R&D/Assets, (5) Q Ratio and (6) WACC Debt. The estimated model has a relatively high discriminatory power. It correctly classifies 24.0% of private and 90.2% of public issues of convertibles, predicting overall 83.9% of the issues.

The outcome of classification tree models basically confirms the results of logistic regression (figure 1)[2]. The first criterion which may influence a management decision to place convertible debt in the private market is a firms' growth opportunities. If they are relatively high ("Q Ratio" more than 9.7 in our case), nearly nine in ten companies issue private convertibles. When firms are less engaged in an investment process ("Q Ratio" ≤9.7), a second important factor for a choice of the marketplace of hybrid debt placement is a degree of leverage – if companies are more indebted ("Debt/Assets" >28.6%), then only one third of profitable firms decide do issue private convertibles. The third criterion which may determine the type of issue is cost of raising debt – if firms are likely to invest more, are more leveraged and can borrow capital at a lower cost ("WACC Debt" ≤2.06%), nearly half of them issue private convertibles.



Source: author's calculations based on the Bloomberg Database.

Fig. 1. **Classification tree model for private and public issues of convertible debt among profitable firms**

Summing up all the results from the empirical analysis, we can conclude that companies in good financial standing may treat convertible bonds as an alternative for common equity and use them to increase equity capital through the backdoor, as suggested by Stein (1992). They possibly try to avoid the issuance of common stock due to their moderate undervaluation which is reflected by lower share price at which companies issue convertible bonds, in comparison to firms that offer hybrid debt in the public market. It is highly possible that issuers settle initial conversion premium at relatively low levels (under 30%), in order to accelerate conversion of debt into equity soon after convertibles issuance.

Furthermore, the private placement of convertibles seems to be popular among medium-sized companies which, close to Blackwell and Kidwell (1988) and Arena (2010), may indicate that they seek to avoid high flotation costs of issuing new securities in the public market. Raising capital from short-listed lenders may come out much cheaper than running a whole process of selling debt to public investors involving law offices, professional consultants and bankers. Borrowing money from private sources can obviously shorten due diligence process carried out by small group of dedicated investors, as highlighted by Fenn (2000). This argument can presumably be crucial for companies with high growth opportunities which may be determined to raise capital very fast in order to finance their new investment projects. This supposition is backed by observations of proxies for growth opportunities of analysed companies, which turn out to be higher for the issuers of private convertibles. According to Mayers (1998), convertibles can be effectively used to finance corporate investment process spread over a few stages. A second advantage of selling convertible debt privately may arise from issuers' intention to conceal from rival firms the information about their valuable investment options, as suggested by Yosha (1995).

As for capital structure, profitable companies seem to be less leveraged and hence more capable to take additional debt bearing in mind that it will not have to be redeemed if bondholders exercise their conversion option. Moreover, until conversion issuers can benefit from reduced cost of external capital since convertibles usually offer lower coupons than

[2] Six independent variables were used in the classification tree model (the same as in the logistic regression model) (1) Debt/Assets, (2) Debt/Equity, (3) CAPEX/Assets, (4) R&D/Assets, (5) Q Ratio and (6) WACC Debt. Due to a strong asymmetry of distribution and a relatively large sample (more than 500 elements), the model was built by means of the CRT algorithm. The estimated model correctly classifies 83.8% of public and 41.6% of private issues, predicting overall 65.1% of the issues.

straight bonds and they can deduct interest as an expense for tax purposes. This is one of the main motives that motivate companies to use hybrid debt financing (Bilingsley and Smith, 1996; Bancel and Mittoo 2004).

It is also important to remember that convertible debt is a peculiar source of finance with an embedded right to convert debt into equity at the option of bondholders who then become shareholders of the issuers. For this reason, companies ought to pay a particular attention to their future shareholders structure and should accurately consider this aspect in advance at the planning stage of hybrid debt issuance. This is why selling convertibles in the private market could help firms to keep their potential stockholders under control and enable them to pursue a proper shareholders selection. It is also possible that searching for funds from dedicated lenders may not be an advantageous option, but rather a necessity of last resort. In case of highly volatile markets, for instance, raising capital from public sources can be markedly constrained and only big institutional investors, like hedge funds (Choi et al., 2010), are inclined to provide the hybrid capital for companies that urgently need a financial support. Thus, we should analyse the private market of convertible debt also from capital suppliers' perspective which may derive from market conditions. This aspect may somewhat constrict the findings of the paper since it considers the motives for placing convertibles privately only from the issuers viewpoint without any regard for lenders angle.

Conclusions

In summary, the empirical examination of over five hundred issues of convertibles carried out by American companies from the service and manufacturing sector and placed in the private market complements our knowledge relating to hybrid debt financing. The purpose of this article was to find out why companies with good financial performance decide to issue convertibles through private offerings. Put simply, its aim was to ascertain why profitable firms raise hybrid capital from a small group of lenders and they do not borrow money from the public market. The novelty of this paper relies on three factors. First, unlike previous studies it concentrates only on convertible bonds and is not a part of the broader examination of debt and equity issuances. Secondly, due to a more actual sample this research brings the former observations for a marketplace for convertible bonds issuances up to date. Finally, the analysis focuses on issues of private debt carried out by profitable entities which was commonly ignored in earlier research on debt financing.

The main findings of this paper are as follows. First, due to undervaluation, profitable companies may use convertible debt as a delayed equity which allows them to increase their equity capital later on at more favorable conditions and thereby avoiding the issuance of undervalued common stock. They presumably search for additional funds to finance their valuable investment options which may lead to the growth of their market capitalization and incentivize bondholders to exercise an option to convert debt into equity long before convertibles maturity. Moreover, until conversion issuers can benefit from reduced coupon of convertible debt and deduct interest as an expense for tax purposes.

Secondly, the main reason for which profitable companies decide to borrow hybrid capital from private sources may result from their need to speed up raising funds without a protracted process of offering securities in the public market and to avoid high flotation costs of selling bonds publicly, including underwriting, legal and registration fees. By selling convertibles in the private market firms are likely to keep control over their future shareholders structure when bondholders exchange debt for specific number of their common stock.

However, several problems related to the issuance of private convertibles by companies in good financial standing need further examinations. For example, it is worth explaining whether the motives for selling hybrid debt through private offering by profitable entities are similar across different markets and whether conclusions to be drawn from this study are not only ascribed to the companies from the United States. Furthermore, we should take a closer look on market conditions and their possible influence on corporate decisions on the marketplace of convertible bonds offerings.

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DEVELOPMENTS OF FINANCIAL LITERACY RESEARCH IN THE BALTIC STATES: A SYSTEMATIC REVIEW

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Abstract. This paper is dedicated to the assessment and analysis of a dynamically developing body of research about financial literacy in the Baltic states (Estonia, Latvia, Lithuania). Almost three decades since entrepreneurial opportunities were formally re-established by the soon-to-fail soviet regime, the concept of financial literacy has been developing with agreeable ambition, especially following the global and financial crisis and during the European debt crisis. Although only relatively recently included in education curricula, financial literacy has been consistently gaining an increased exposure in the fields of financial, management and education policy analysis based on the impact of behaviour on economic and financial decisions and therefore economic activity. These recent developments in turn have prompted an increased research output on financial literacy, which sets the stage for the main theoretical and practical implications of this paper. The main defining types of sources for this paper are primary and secondary sources, as well as conceptual and theoretical research concerned with description or analysis of the topic of financial literacy. The approach involves dividing the literature into themes and categories, presenting the literature chronologically and exploring and examining the theoretical and methodological literature. For such a vigorously and enthusiastically developing body of research, the conclusions elucidate the demand for a broader analysis of the impact of financial literacy and financial education on economic decision-making in the Baltic states. The last section offers insights on what is still needed to be cultured if researchers are to apprise the theoretical and empirical research, as well as public policy and private initiatives.

Key words: *Baltic states, financial education, financial literacy, systematic literature review*.

JEL code: A20, D14, I20

Introduction

The research body that is devoted to the analysis of a continuously developing field – financial literacy, is currently experiencing an increase in interest, both academic and in terms of policy implementation. In countries such as the Baltics, which can be described as small and open economies, the effects of certain policy decisions are more evident and pronounced. Education and financial policy of the Baltic states is bound together by what is known as financial literacy and financial education. The consumer decisions on how and why to consume, save, lend or take out a loan, are shaping the whole fabric of the respective national economies and influencing the present at a determinable rate and the future in yet unknown ways.

The purpose of this article therefore is to assess the research body concerning financial literacy in the Baltic states in recent years. The article explores the literature systematically, borrowing the systematic literature review methods from life sciences. As a synthesized research method, it allows for a more disciplined and evidence-based analysis approach to be performed.

The main goals of this article are to analyse and summarize existing literature, as well as synthesize review results, The article aims to establish a framework for further research using systematic review research methods in the field of social sciences.

This article consists of an introduction to the economic developments in the Baltic states, followed by an overview of the systematic review research methods and its implication in the context of this article, as well as presenting the article

selection process and analysis of the implications. After the research methods are discussed, the analysis of articles devoted to financial literacy will be carried out, followed by conclusions, proposals and recommendations.

The research questions are essential for a proper systematic review in the field of economics. Although not as strict as in life sciences, the research questions shape the scope of this article. The questions are as follows:

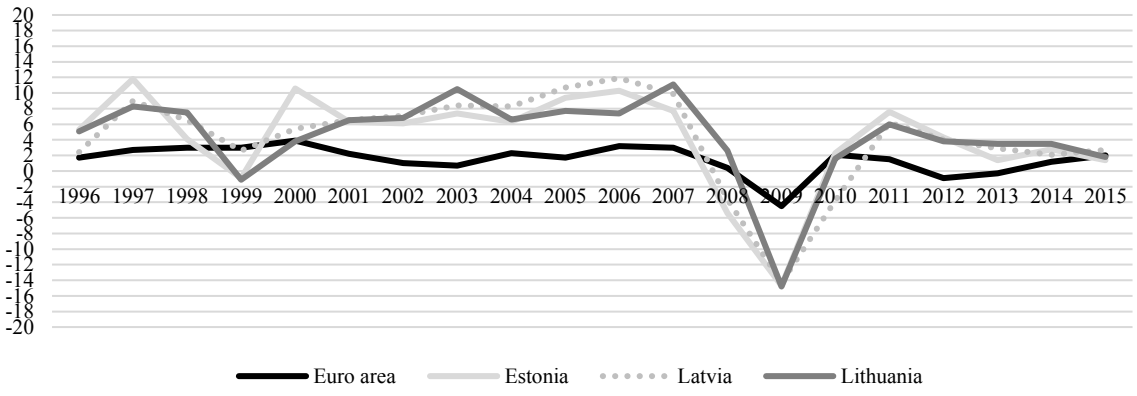
1. Should financial literacy in the Baltic states be researched?
2. Is there a connection between financial literacy and economic developments?
3. Is financial literacy sufficiently promoted?
4. Is there institutional support for financial literacy?
5. What are the research results? What are the conclusions? Are they comparative?
6. Is there a national strategy for promoting financial literacy?

Currently there is little to none research that analyses the status of financial literacy in the Baltic states, be it a qualitative or a quantitative study. Therefore, as a highly innovative article, there are certain limitations that will also be addressed in this research and, hopefully, will spark an enduring debate and discussion.

Research results and discussion

1. Economic developments in the Baltic states

The existence of a credible national currency is of importance because a liberalization of capital flows is incomplete without a reasonably functioning foreign-exchange market. All three countries substituted away from the Russian rouble in 1992, with Estonia implementing a currency board in mid-1992, as Bems, R.; Jönsson (Bems, Jönsson, 2005) argue. In the same year, Latvia and Lithuania introduced transitional currencies that were allowed to float, authors note. In 1993, Latvia adopted a permanent currency, which was pegged to the Special Drawing Rights (SDR) at the beginning of 1994. The Lithuanian permanent national currency was not issued until the end of 1994, when a currency board was established, as authors suggest.



Source: Eurostat

Figure 1. **GDP growth in the Baltic states (1996-2015, year-over-year).**

After large GDP declines in the early 1990s, the second half of the decade saw rapid economic growth, only interrupted by the fallouts from the Russian crisis in 1999, as research demonstrates. The period from 2000 to 2007 was characterised by increasing rates of economic growth. This growth spurt ceased along the outbreak of the global financial crisis, . In all three countries GDP declined by approximately 14 percent in 2009, a deeper decline than in any other EU country. Staehr (Staher, 2015) also elucidates that GDP growth bounced back in 2010 and 2011 but has since then been at subdued levels.

Research also concludes that the Baltic states exhibit features that could potentially make them vulnerable to the middle income trap. Some argue that the Baltics have gone through an exceptionally severe economic and financial crisis, the production and export structures are tilted toward low-tech products, and the education sector might exhibit quality problems. None of these factors prevent a return to fast economic growth and rapid convergence, as research suggests, but they do indicate the challenges faced by policymakers in the Baltic states.

Researchers like Irandoust (Irandoust, 2014) suggest that foreign direct investment (FDI) growth and gross domestic product (GDP) growth are causally related in the long run. Irandoust also argues that the lack of bidirectional causality in Latvia and Lithuania might stem from the fact that these countries have not moved as fast as Estonia with the timing and the implementation of reforms and have not carried out enough reforms in the areas of enterprise and competition policy compared to Estonia.

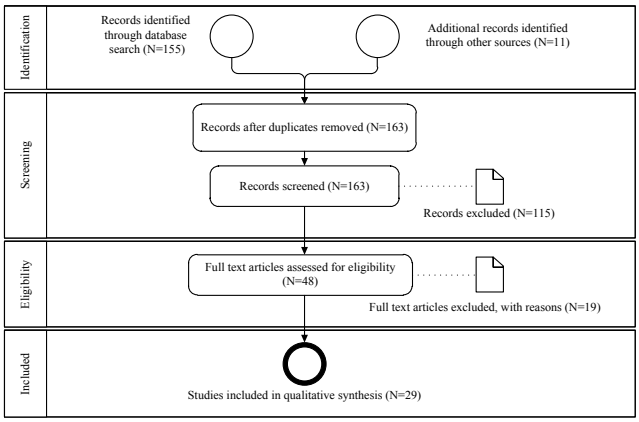
Research argues that the Baltic states have seen rapid convergence of income levels during the almost two decades from 1995 to 2013 but two observations can be made. The global financial crisis meant an immediate discontinuation of the convergence process and the output performance has not returned to its pre-crisis trajectory, as noted in research. Second, cultural and communication links mean that the Baltic states often compare themselves with the neighbouring Nordic countries, and GDP per capita in these countries is typically above the average European level, research of Staehr elucidates.

It is therefore essential for this review to bear the burden of historic perspective throughout the analysis. The middle income trap is a threat that should be isolated in order to measure the effects of financial decisions made by consumers. Also, the fragile economic growth that is affected both by internal and external challenges, needs to be preserved, and, as research suggests, financial literacy is one of the components that helps to do so.

2. Applying systematic review methods

Systematic review seeks to systematically search for, appraise and synthesize research evidence, often adhering to guidelines on the conduct of a review. When conducting a systematic review, one seeks to systematically search for, appraise and synthesize research evidence, often adhering to guidelines on the conduct of a review. The systematic review method then deals with what is known and allows for recommendations for practice to be made. Grant and Booth (Grant, Booth, 2009) also argues that the method also allows to elucidate on what remains unknown; uncertainty around findings are brought to the surface, recommendations for future research can be made.

There are several approaches towards performing a systematic review, but the PRISMA method is one of the most widely used and offers transparent reporting for systematic reviews (Moher et.al., 2009).



Source: The PRISMA Group

Figure 2. **Preferred Reporting Items for Systematic Reviews**

In order to perform the screening and qualitative synthesis, research questions are an indispensable tool. For this review, the research questions are as follows:

1.1. Should financial literacy in the Baltic states be researched?

1.2. Is there a connection between financial literacy and economic developments?

1.3. Is financial literacy sufficiently promoted?

1.4. Is there institutional support for financial literacy?

These research questions that are instrumental for qualitative synthesis, should be answered in a more in-depth manner, putting for more emphasis on the author's perspective:

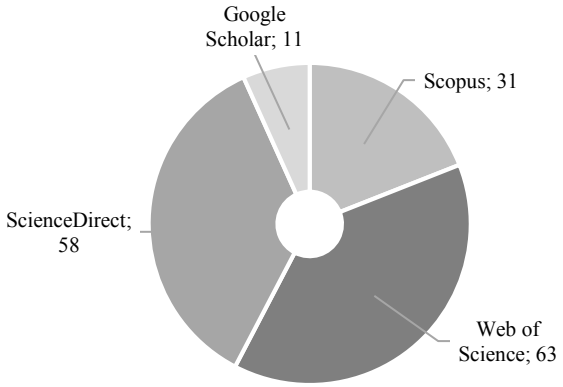
2.1. What are the research results? What are the conclusions? Are they comparative?

Also in order to promote comparability, the following research question should be addressed:

3.1. Is there a national strategy for promoting financial literacy?

Altogether there were 166 records identified through online database searching, 3 duplicates were removed. That resulted in 163 titles selected for further screening. The search included respected and well-known online databases: Scopus[1] (31 article, 19%), Web of Science[2] (63 articles, 39%), ScienceDirect[3] (58 articles, 35%), and Google Scholar[4] (11 articles, 7%) as an auxiliary source for a broader perspective of the research topic. The resulting breakdown can be observed in Figure 3.

[1] Scopus – Elsevier. https://www.scopus.com
[2] Web of Science – Thomson Reuters / Clarivate Analytics http://www.webofknowledge.com/
[3] ScienceDirect – Elsevier. http://www.sciencedirect.com/
[4] Google Scholar. Google. http://scholar.google.com



Source: Author's own calculations

Figure 3. **Databases and sources containing articles (number of articles)**

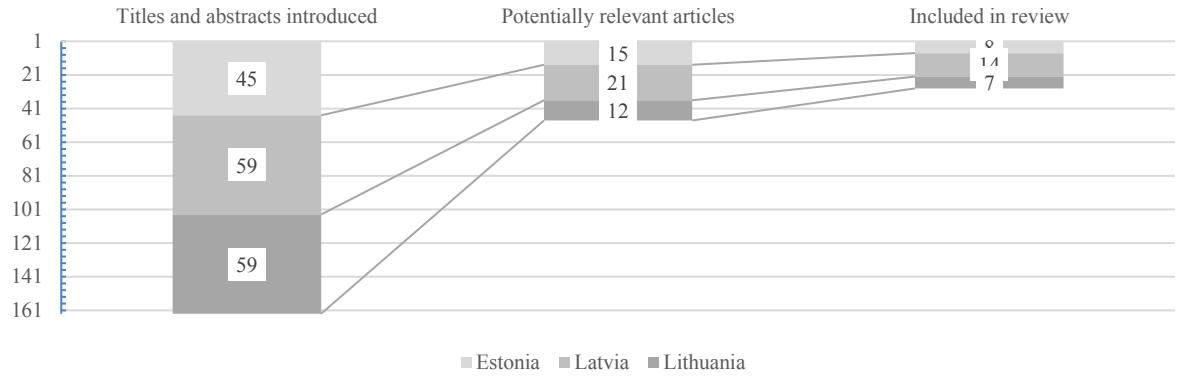
Following screening, 115 titles were removed due to the following reasons:

1. Inapplicable geographical scope (72 articles, 63%);
2. Failure to meet the set time-scope (36 articles, 31%);
3. *Grey* literature and other reasons (7 articles, 6%).

The remaining 48 articles were then assessed by analysing their full-textual materials. As this was the most time-consuming part of the research, it also provided valuable insight into the body of work that make the core of this review and may be of use in being included in other types of research, not limiting to systematic literature reviews. Altogether there were 19 articles excluded, based on how the articles address the specific research questions (see research questions 1.1.-1.4.). The rule for this systematic review was set as follows: there can be no more than 2 research questions answered with an unspecified or uncertain answer.

Then the remaining 29 articles were included in the systematic review.

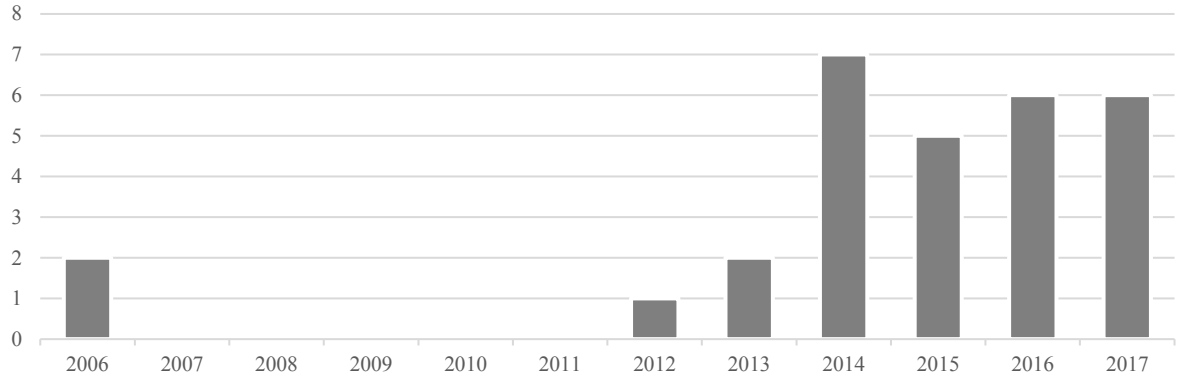
It is obvious that there are evidences of differences among the Baltic states, firstly concerning research imbalances. Among the three Baltic states there is rarely a symmetrical approach in terms of the amount, scope, depth and breadth of the research conducted. Also in this review, the difference is obvious: out of 163 titles and abstracts introduced, 45 (28%) originated from Estonia, 59 (36%) in Latvia and Lithuania. From the list of potentially relevant articles for this review, which consists of 48 articles, 12 (25%) originate from Lithuania, 15 (31%) from Estonia and 21 (44%) in Latvia. Included in this review however were 29 articles (18% out of titles and abstracts introduced and 60% of potentially relevant articles. They are made up of 14 articles from Latvia (48%), 8 articles from Estonia (28%) and 7 articles from Lithuania (24%). The data is presented in Figure 4.



Source: author's own calculations

Figure 4. **Article breakdown for the review, based on countries of origin (number of articles)**

Only 3 articles (10%) included in the review cover all three Baltic states which allows to argue that there is a lack of Baltic perspective among the articles reviewed. There is also an elevated risk of comparability issues that arises from the notion that articles use quantifiable data very seldom and almost every article has its own methodological approach. That includes assessing the levels of financial literacy, if that is at all performed. Therefore, it is possible that certain level of research bias and subjectivism is present among the articles, albeit at a difficult to determine level and nature.



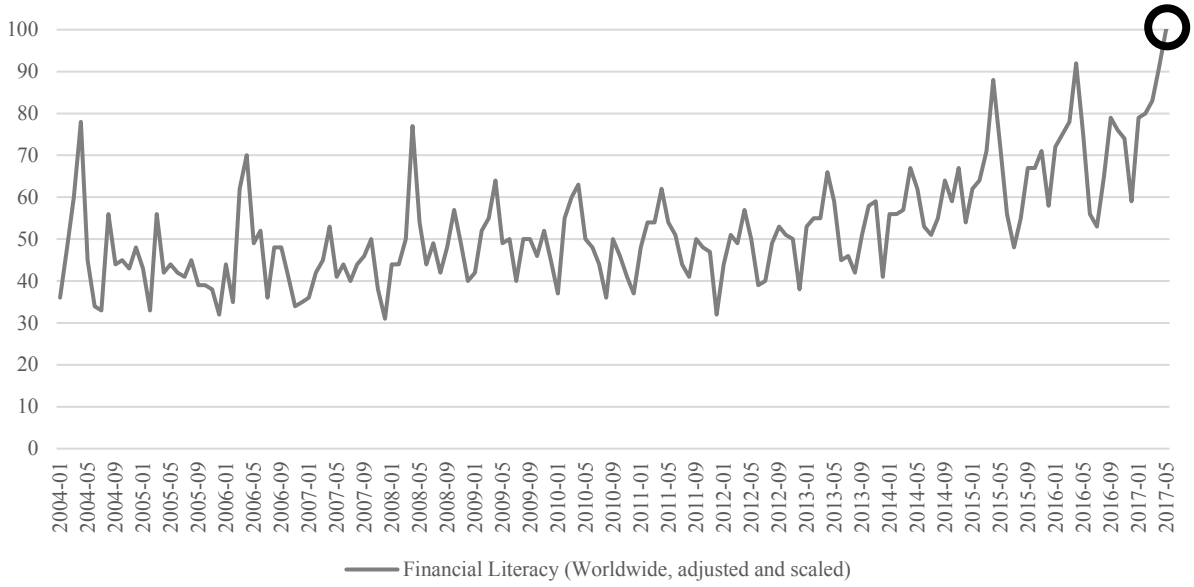
Source: author's own calculations

Figure 5. **Article breakdown for the review, based on countries of origin (number of articles)**

There are differences in the time-scope of the review. As it was set from 2006 to 2017, there are several points worth noting. First, as observed in Figure 5, the most articles were published during the year 2014, which coincides with an increasing interest in the data provided by *Google Trends* (see Figure 6). Also, the number of articles remains above 5 for the consecutive years. Second, there were no articles found that were published between 2007 and 2011. There were no specific explanations for the absence of articles, but an educated guess might elucidate the impact of the financial crisis on the diminished research among other factors.

3. Financial literacy: results of the review

Before performing analysis on the research article, there is room for a curious way to explore the significance of financial literacy as a term by examining *Google Trends* data. As much answers the examination provides, it also raises questions. For example, why is the interest over time increasing? What are the factors that influence such an increase? Why are there some seasonal spikes in the trend? What explains for the decreases in overall interest over time?



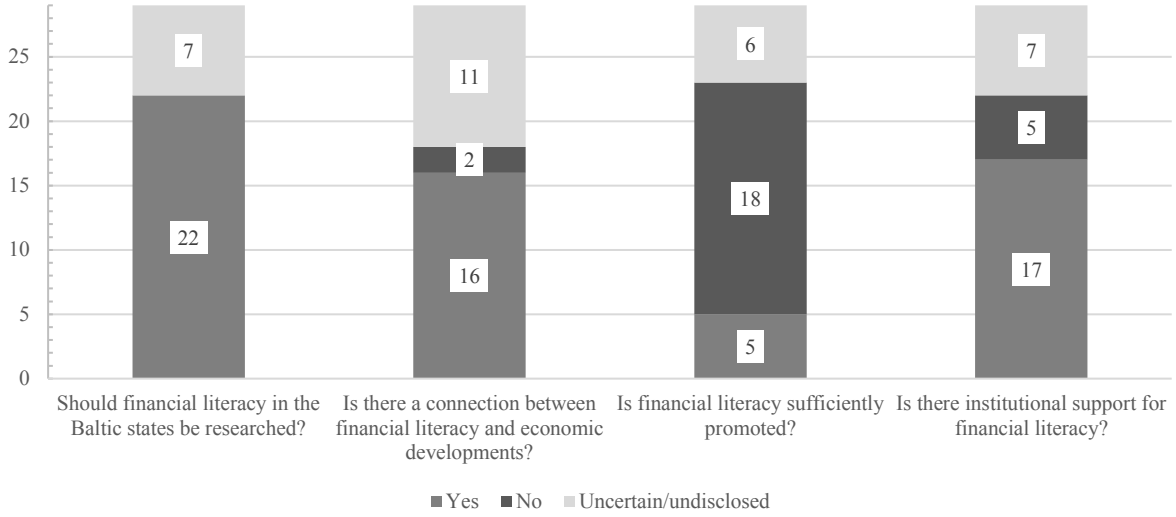
Source: Google Trends

Figure 6. **Financial literacy: interest over time, Google Trends (2004-2017)**

Google Trends provides an index based on time series of the volume of queries users search *Google* for in a specified area. As researchers like Choi and Varian argue (Choi, Varian, 2012), the query index is based on query share: the total query volume for the search term in question within a particular geographic region divided by the total number of queries in that region during the time period being examined. Researchers also note that the maximum query share in the time period specified is normalised to be 100, and the query share at the initial date being examined is normalised to be zero. The queries are 'broad matched' in the sense that queries are counted in the calculation of the query index, researchers note.

In this case, the index is at the maximum level of 100 (as of May 2017, the circle in Figure 6), therefore it indicates that worldwide the term "Financial literacy" is at the height of interest, at least as part of online search. Since January 2014, the overall interest in the term has increased, with previous peaks observed in May 2004 (71), April 2008 (76), 2015 (86) and 2016 (92), that allow to make two conclusions. First, there is an increased seasonal facet in the trend. Second, there is limited evidence that the interest in the search term relates to events in the economy, as seen in the 2007-2009 data, which seems not to be strictly connected with the events of the global financial crisis.

Moving on to the analysis of financial literacy, there are several points worth noting. As can be observed in Figure 7, all research questions are answered with one answer clearly dominating over other answers.



Source: Author's own calculations

Figure 7. **Research questions addressed (number of articles)**

The majority of articles (22 articles, 76%) included in the review suggest that financial literacy in the Baltic states should experience more research. Indeed, there were no denying answers to this research question. Out of the 29 articles included in this review, 7 articles (24%) showed signs of uncertainty regarding this research question.

The question about connection between financial literacy and economic developments is somewhat more contested than others. Figure 7 demonstrates that a positive affirmation can be observed in 16 articles (55 %). A negative answer is found in 2 articles (7 %). There are also uncertain or undisclosed answers – namely, 11 (38 %). This suggests that there is little consensus among researchers about the connection of levels of financial literacy and economic developments in the Baltic states, although the ratio of articles containing uncertainty is exceedingly high and allows to make a notion about further research necessity.

Figure 7 also describes if the articles contain information about the attitudes of articles towards promotion of financial literacy. The majority of articles (18 articles, 62%) point out that financial literacy is insufficiently promoted. Only 5 articles (17%) argue that the promotion is at a sufficient level, yet 6 articles (21%) contain no direct attitude towards this research question.

The analysis of articles also shows evidence of a varying degree of institutional involvement and support. Out of articles reviewed, 17 articles (59%) suggest that the institutional support is sufficient, as seen in Figure 7. Such institutions as central banks, governmental agencies and other bodies demonstrate great variability of support towards research of financial literacy, as well as implementing the research suggestions. 5 articles (17%) are negative about the levels of support, and 7 articles (24%) contain little to none indication, as Figure 7 indicates.

Nevertheless, articles also allow for certain similarities to be encountered. Almost all articles agree about importance of financial literacy and its research. Also, the impact of financial literacy on the economy is emphasized as an important evidence of positive effects of sound financial behaviour. Articles mention the evolution of the concept as a valuable asset. Many articles propose definitions and amend existing explanations about financial literacy; by doing so they contribute to the growing body of research available.

But the most important contribution of the articles is the developments of theoretical and practical framework definition. As research on financial literacy is carried out world-wide, the region-specific approach is invaluable in promoting a balanced, all-encompassing research that not only excels in bringing the important determinants and

contributors of financial literacy to the surface, but also exploring the mechanisms of behavioural economics in a multidisciplinary setting. As the concept of financial literacy encompasses the concept of economics, finance, education and management, the research then contributes to all these fields, albeit in an asymmetrical way.

Authors such as Peleckis, et.al. (Peleckis, et al., 2016) argue that insurance contributes significantly to economic growth by improving the investment climate and promoting efficient mix of activities of economy than would be undertaken in the absence of risk management instruments. Peleckis, et.al. note that from other side economic growth and wealth are the most important determinants for insurance market growth and penetration (Peleckis, et al., 2016).

A cross disciplinary approach is presented by Sarnovics, et. al. (Sarnovics, et. al, 2014). Their research focused on co-operation opportunities in order to improve financial literacy among youngsters, concluding that one of the most important issue is to promote the cooperation between secondary school teachers and the experts in the field of finance.

Authors like Titko, Ciemleja and Lace (Titko, et.al., 2013, 2014 and 2015), Dunska, Kravinskis (Dunska and Kravinskis, 2016) and others have tried to assess the levels of financial literacy and compare them with other countries and regions, noting, that the results in some cases are similar to the average levels of other countries.

Ijevleva and Arefjevs suggest that there is potential for content improvement in open web resources to achieve a broader coverage of financial literacy items as well as include the price literacy perspective (Ijevleva, Arefjevs, 2014). Authors like Saksonova and Orlova argue that low levels of financial literacy may be one of the contributing factors to the low level of long-term savings along with low levels of disposable income and the demographic situation (Saksonova, Orlova 2013).

Researchers like Riitsalu and Poder (Riitsalu, Poder, 2016) analyse the factors behind the differences in financial literacy when financial education is not provided. Their research also offers insight into how students in a similar education system in two different cultural and language frameworks achieve different financial literacy scores. Moreover, the results of their research demonstrate how indicators, such as family background can work through different channels as opposed to the usual parental education or occupation based socio-economic indicators.

Brige (Brige, 2016) provides an analysis of information technology and communications development in banking, that side-effects provides useful information not only for transitional countries but also for developing countries.

The factors affecting the low level of financial literacy in Lithuania and other countries are examined in the research undertaken by Navickas, Gudaitis and Krajnakova (Navickas, Gudaitis, Krajnakova, 2014). Results of the survey of Lithuanian residents are compared to results of similar foreign researches in the research of respective authors.

Opletalova (Opletalova, 2014) argues that the research findings in the Czech Republic and from the World Bank have shown high levels of household debt while also indicating the need for higher levels of financial education. She argues that financial literacy and financial instruction in schools would be an effective tool to prevent such developments. Latvia is mentioned in this article as a country at an advanced stage of design of a national financial literacy strategy in comparison.

A more general approach is evident in the research of Mihalčova, Csikosova and Antošova (Mihalčova, Csikosova and Antošova, 2013). These researchers note that a key element in the decision making in all areas of our lives is financial literacy. They suggest that ability to understand financial products which normally people come into a contact is a reflection of financial literacy everyone. Global problem is inadequate level of financial literacy, therefore it is appropriate to research this issue in depth, as the authors conclude.

An important conclusion is drawn in the research of Ishmuhametov and Kuzmina-Merlino, as they discover that striving for attainment is one of the main motivational factors for the achievement of financial literacy and development of financial management skills.

Despite Estonia's advanced adoption and progressive policies and practices toward the Internet, Americans are more willing to disclose, and less concerned about perceived risks, argues Robinson (Robinson, 2016). The findings of the author suggest willingness to disclose and risk aversion can and should be analysed empirically together, including the lack of or awareness of financial literacy.

Giofre has discovered that higher investor financial education fosters international diversification, and that its role is particularly pronounced where information problems and monitoring costs are likely to be more severe, that is, in countries where protection of minority shareholders' rights is weaker. The author then interprets this evidence as supportive of the conjecture that financial education lessens the informational constraints binding foreign investors.

Jappelli and Padula 2013 argue that present an intertemporal consumption model of investment in financial literacy. Authors believe that consumers benefit from such investment because financial literacy allows them to increase the returns on wealth. Since literacy depreciates over time and has a cost in terms of current consumption, as the authors suggest, the model delivers an optimal investment in literacy. Furthermore, literacy and wealth are determined jointly, and are positively correlated over the life-cycle, as described by the authors. Their research indicates that the stock of financial literacy early in life is a valid instrument in the regression of wealth on financial literacy. Using microeconomic and aggregate data, the authors find strong support for the model's predictions, which is still to be time-tested.

Four major transformational challenges (strategic reorientation, shifts in resource acquisition logic, workforce rationalization and renewal, and changing organizational configuration) are identified and discussed in the research by Baliga and Santalainen. The relative influence of culture in meeting these state-owned enterprise transformational challenges along with formulating and implementing policies for economic reforms are discussed in the research undertaken by the authors.

The last research question to be answered concerns the national strategies of financial literacy in the Baltic states. As of 2017, Estonia and Latvia have an active and ongoing implementation phase of a broad-reaching national financial literacy strategy (OECD, 2015). Lithuania has no active financial literacy strategy in place. In 2015, Lithuania has participated in the PISA study, which is a welcomed step towards obtaining necessary data for a strategy to be introduced.

Conclusions, proposals, recommendations

After a thorough analysis of research related to the research questions, the main conclusion is that financial literacy allows for sound financial decisions to be made. A broader public and private involvement fosters development of new tools for promotion of financial literacy.

This allows to conclude that behavioural economics should be viewed as the theoretical framework for further research into the field of financial literacy. There are many cases evident throughout the literature where behavioural economics approaches were used (but sometimes not explicitly named), therefore as a constantly evolving field of science, there is certainly place for more concrete evidence to arise.

Surveys and expert panels for applied research are again an invaluable proposal as a tool for further research. Data collected via surveys was, is and will be instrumental for continued research in the topic.

There is evidence among the articles reviewed about the positive impact of financial literacy on overall economic developments in the respective countries, especially when such behavior as saving and investing is concerned. Especially regarding the recent economic developments in the Baltic states and the past full of struggle, financial literacy promotion is an often-overlooked branch of economics.

A systematic review approach towards financial literacy helped to consolidate existing research in a solid manner; being based on life-science methods and evaluated through numerous examples, the method is yet to be fully adapted in the research of economics. Although the method has its flaws, we hope to see more research carried out in this trans-sectoral method

Most of the 29 articles selected for systematic review state that there is a need for a lasting and thorough promotion of financial literacy topics. Impact on policymakers, of course, is determined by the degree of institutional support financial literacy enjoys in respective countries and environments. Although there is great variability towards the support of institutions, most articles analyzed in this review show that the support is sufficient.

Most articles included in this systematic review suggest that there should be more research devoted to the topic of financial literacy and that is a suggestion that we cannot oppose.

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INDICATORS OF THE INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) SECTOR ACTIVITY IN LATVIA AND THE EU

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Abstract. IT businesses currently occupy the first five places of the world's top 10 most valuable companies. Digitization is developing rapidly and convincingly all over the world. Information exchange and electronic products have become an essential part of our lives. The aggressive entry of the digital economy into the fields of engineering industry, finance, consumption, services, and others has facilitated a more efficient evolution of services and products. The digital economy has a substantial effect on our lifestyle: the costs of information dissemination, communication, and various other processes have vanished entirely, increasing the pressure on deflation. The digital technologies play a decisive role in the growth of the European economy. One of the goals of the European Union is to create a common digital market. Whereas at the beginning of 2000s it was considered that the digital economy consists mainly in e-business infrastructure (hardware, software, telecommunications, networks, human capital, etc.), e-business (form of entrepreneurship), and e-commerce (Mesenbourg, 2001), now their borders are blurred and the concept itself has acquired a more complex meaning (Imlah, 2013). The digital economy comprises all goods and services which include digital technologies as an essential component, which is in turn ensured by the information and communication technology (ICT) sector of economy. The study aims to analyze the main business activity indicators of ICT businesses in Latvia in comparison to other EU countries and in the EU for the period of 2008 to 2015. The study uses methods of statistical analysis, the data sources being the data bases of the Central Statistics Bureau of the Republic of Latvia, and Eurostat.

Key words: *digital economy, information and communication technology*

JEL code: M15, M21,014

Introduction

ICT businesses currently claim the top five places among the world's most valuable ten companies. Digitization is developing rapidly throughout the world. Information exchange and electronic goods have become an essential part of our daily lives. The aggressive entry of the digital economy into the sectors of machine-building, finance, consumption, services, and others has encouraged a much more efficient development of services and products. The digital economy has a significant impact on our lifestyle: the costs of information distribution, communication, and various processes have completely disappeared, putting more pressure on deflation. The digital technologies are decisive in the growth of the European economy. One of the goals of the European Union is to form a common digital market (EPP Group Position Papers on the Digital Economy).

At the beginning of 2000s, it was considered that the digital economy consists in the e-business infrastructure (hardware, software, communications, networks, human resources, etc.), e-business (business form) and e-commerce (Mesenbourg, 2001), but today the borders between these have blurred and the concept itself has become more complex (Imlah, 2013). The benefits of ICT in terms of innovation, productivity, inter- nationalization and growth have been well recorded in all firms in general and SMEs (Giotopoulos, I., Kontolaimou, A., Korra, E., Tsakanikas, A., 2017).

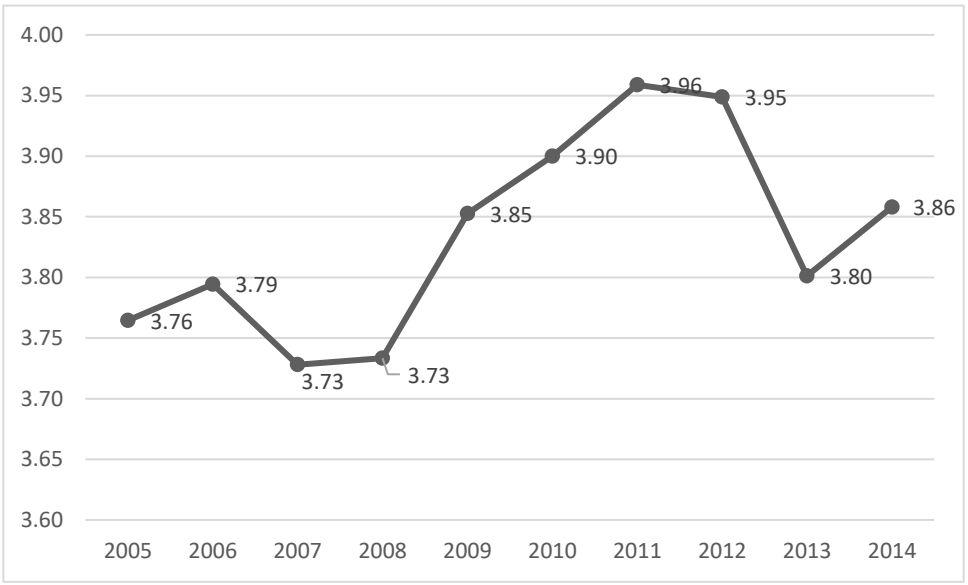
European Commission services selected more than 100 indicators, divided into thematic groups, which illustrate some key dimensions of the European information society, one of which is the ICT sector's activity indicators. These indicators allow a comparison of progress across European countries as well as over time (European Commission Digital economy). Since 2014, The Digital Economy and Society Index (DESI) has been published, a composite index developed by the European Commission (DG CNECT) to assess the development of EU countries towards a digital economy and society. It aggregates a set of relevant indicators structured around 5 dimensions: Connectivity, Human Capital, Use of Internet, Integration of Digital Technology and Digital Public Services (European Commission, DESI)

In summary, it can be said that the digital economy encompasses all goods and services containing digital technologies as an essential component, which are in turn ensured by the ICT sector of the economy.

The study put forth the question of what the role of the ICT sector is in the Latvian economy and what trends of ICT development could be observed between 2008 and 2015. The purpose of this article is to analyze the main business activity indicators of ICT businesses in Latvia, comparing them against the other EU countries, for the period of 2008-2015. The study uses statistical analysis methods and the data sources are the databases of the CSB of the Republic of Latvia and Eurostat, various documents of the EU institutions, scientific literature.

Research Results and Discussion

One of the indicators characterizing the sector's importance in economy is the ICT sector's ratio in the GDP and its change trends (Figure 1).



Source: author's construction based on Eurostat, Digital economy and society Database

Fig. 1. **Percentage of the ICT sector (total) in GDP, in EU**

According to the data, an average EU ICT ratio in GDP grows fastest during an economic crisis (2009-2011), although the data differs vastly by country (Table 1). The greatest decrease has been seen in Finland, Spain, Greece.

Table 1

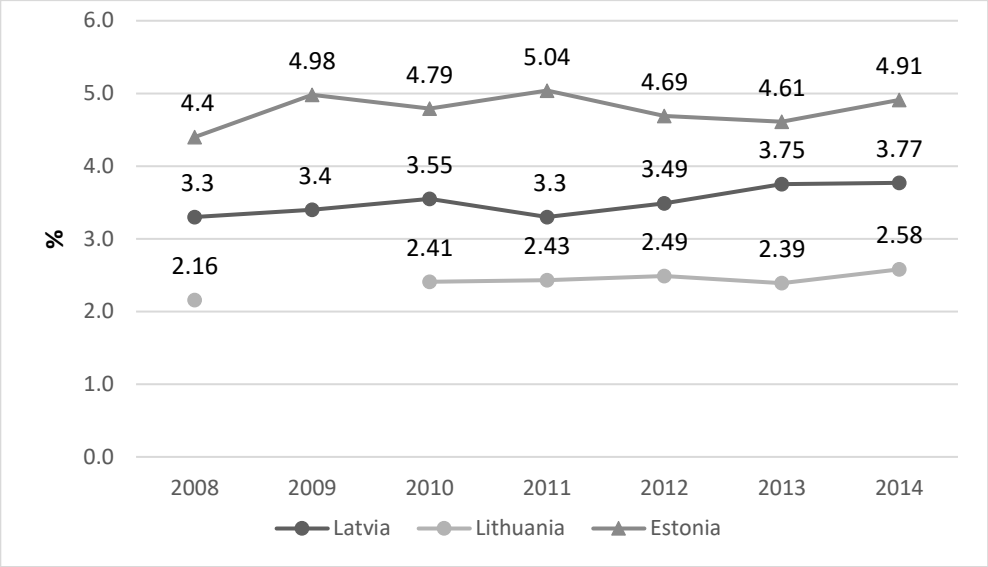
Percentage of the ICT sector (total) in GDP

Country	2008	2009	2010	2011	2012	2013	2014	2014/2008, %
Belgium	…	4.4	4.48	4.09	4.11	4.04	3.84	87.3*
Bulgaria	5.02	4.86	4.83	4.64	4.58	4.69	4.9	97.6
Czech Republic	…	4.47	4.43	4.38	4.38	4.4	4.31	96.4*
Denmark	4.63	4.83	4.62	4.62	…	…	…	…
Germany	3.96	4.12	3.88	4.02	3.98	4.05	4.18	105.6
Estonia	4.4	4.98	4.79	5.04	4.69	4.61	4.91	111.6
Greece	2.61	…	2.13	2.06	2.04	1.98	1.84	70.5
Spain	3.52	3.49	3.42	3.39	3.35	3.3	3.18	90.3
France	4.03	3.99	4.03	4.06	4.02	…	3.85	95.5
Croatia	4.16	4.09	4.64	4.07	3.91	4.13	4.1	98.6
Italy	3.4	…	…	3.43	3.49	3.26	3.23	95.0
Latvia	3.3	3.4	3.55	3.3	3.49	3.75	3.77	114.2
Lithuania	2.16		2.41	2.43	2.49	2.39	2.58	119.4
Hungary	5.83	5.75	5.71	5.99	5.82	5.87	5.69	97.6
Malta	6.77	6.05	7.43	9.02	8.71	6.85	7.2	106.4
Austria	3.21	3.16	3.13	3.26	3.16	3.24	…	…
Poland	…	3.06	3.19	3.27	3.12	3.01	3.05	99.7*
Portugal	3.5	3.43	3.46	3.32	3.32	…	…	…
Romania	3.27	3.27	3.09	3.07	3.17	3.12	3.31	101.2
Slovenia	3.34	…	3.51	3.49	3.57	3.62	3.62	108.4
Slovakia	4.41	3.69	4.67	4.48	4.73	…	4.13	93.7
Finland	6.68	5.03	5.2	4.35	3.65	4.34	…	…
Sweden	…	6.27	6.4	…	…	…	6.41	102.2*
United Kingdom	5.88	…	5.5	…	…	…	5.79	98.5

*2014/2009

Source: author's calculations based on European Commission, Eurostat, Digital economy and society Database

For instance, the ICT sector's ratio in GDP in 2014 grew in 9 EU countries of the 20 referenced when compared to 2008 (in 4 when compared to 2009), which includes Latvia (114.2%). The greatest contribution to the GDP in 2014 was demonstrated in Malta, Sweden, the United Kingdom, Hungary, Estonia, with Latvia ranking 13. Since 2008, the total ICT sector contribution to the total GDP has been equal to 3.30 - 3.77% (Figure 2), and among the Baltic States Latvia is second to Estonia's indicators.



Source: author's construction based on Eurostat (http://ec.europa.eu/eurostat/web/digital-economy-and-society/data/main-tables)

Fig.2. **Percentage of the ICT sector (total) in GDP in Latvia 2008-2014**

The change in ICT sector's contribution to the GDP from 2008 (benchmark) to 2014 attests to the conclusion that Lithuania, Latvia, and Estonia showed the highest increase rate, 19,4%, 14,2% and 11,6% respectively. The list is supplemented by Malta, Germany, Romania, while other countries showed negative growth. The list of the countries where the crisis did not bring increased ICT sector's ratio in the GDP contains the United Kingdom, France, Italy, Spain, Greece, Denmark, Finland. The comparatively stable growth of the Latvian ICT sector's ratio in the total GDP even during the economic crisis shows that the sector has the potential for development, since in the 2016 Digital Economy and Society Index (DESI) Latvia falls into the cluster of catching up countries, scoring below the EU average and with an above average growth from previous year. (Europe's Digital Progress Report, 2016) High speed broadband infrastructure is a precondition for digitalisation and Latvia performs well in this respect with 91% of homes having access to high speed broadband connections. In 2013, the Government approved Information Society Development Guidelines for 2014 - 2020, which is the current national strategy for digitisation. The goal of the Guidelines is to provide the opportunity for anyone to use ICT, to create a knowledge-based economy and to improve the overall quality of life by contributing to national competitiveness, and increasing economic growth and job creation.

In the EU countries, most the ICT sector's contribution to the GDP is provided by ICT services – from 70.8% in Hungary to 97.8% in Spain, with Latvia coming up to 92.3% (Estonia – 83.3%, Lithuania – 97.7%). The proportion of ICT manufacturing in the GDP is significantly smaller in the EU, in some countries even minuscule, e.g. Spain – 2.2, Lithuania – 2.3% (Table 2), of which the highest it is in Hungary – 29.2%.

Table 2

Percentage of the ICT sector in GDP, 2014

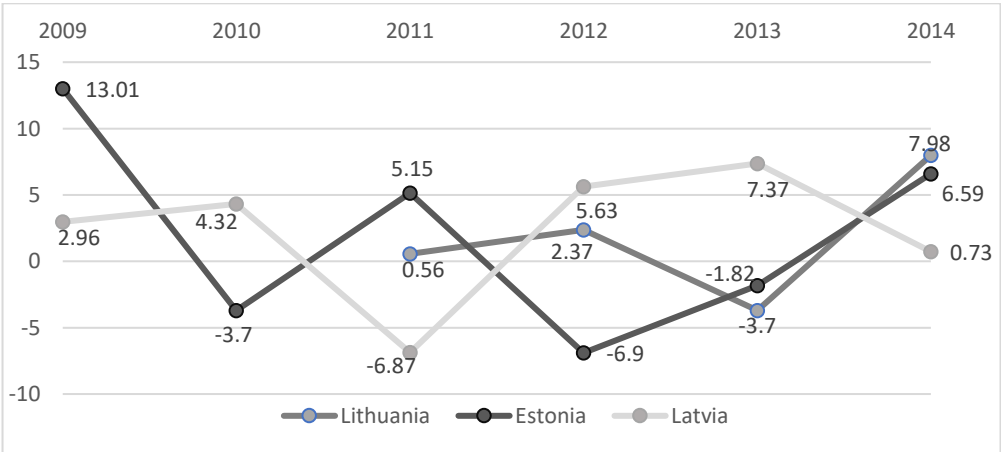
	Country	ICT Total	ICT manufacturing	ICT services	ICT services of Total, %
1	Malta	7.2	…	…	…
2	Spain	3.18	0.07	3.11	97.8
3	Lithuania	2.58	0.06	2.52	97.7
4	Greece	1.84	0.04	1.79	97.3
5	United Kingdom	5.79	0.2	5.59	96.5
6	Bulgaria	4.9	0.22	4.68	95.5

7	Belgium	3.84	0.24	3.6	93.8
8	Romania	3.31	0.21	3.1	93.7
9	France	3.85	0.26	3.6	93.5
10	Italy	3.23	0.24	2.99	92.6
11	Latvia	3.77	0.29	3.48	92.3
12	Poland	3.05	0.27	2.79	91.5
13	Croatia	4.1	0.37	3.73	91.0
14	Slovenia	3.62	0.33	3.29	90.9
15	Germany	4.18	0.38	3.79	90.7
16	Czech Republic	4.31	0.44	3.87	89.8
17	Estonia	4.91	0.82	4.09	83.3
18	Slovakia	4.13	0.75	3.38	81.8
19	Sweden	6.41	1.19	5.22	81.4
20	Hungary	5.69	1.66	4.03	70.8

Source: Author's calculations based on Eurostat

The value added

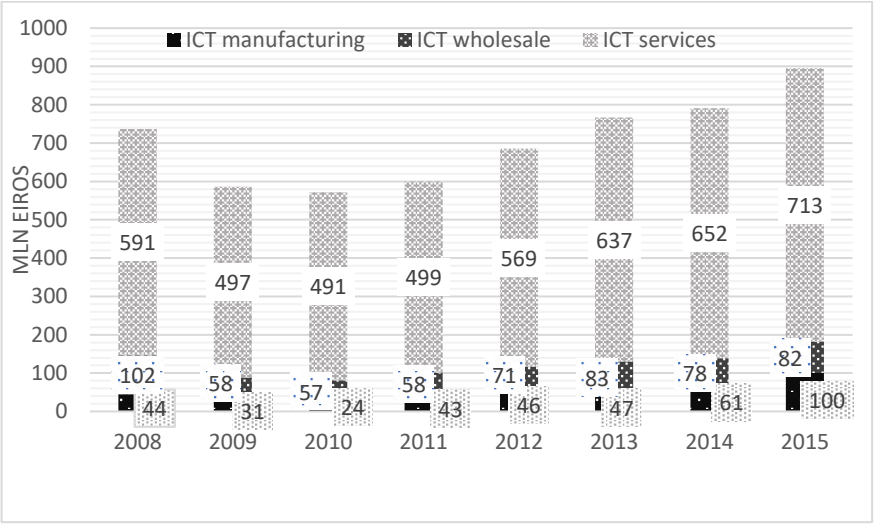
Over the period of 2008-2015, the most rapid year-on-year percentage change of the value added (at factor cost of the ICT sector at current prices) was in Malta (from -21.3% to +23.9%), Slovakia (from -16.3% to + 26.5%), Finland (from -24.7% to + 19.1%) and Croatia (from -12.3% to 13.6%). The smallest year-on-year fluctuation was observed in France (-1.13 to 0,91), Slovenia (-0.72 to 2.43), Czech Republic (-2.0 to 0.34), Austria (-2.7 to 4.0). a stable albeit negative year-on-year percentage change of the value added was in Spain, even though it did not exceed -3.56% (Eurostat). In other countries, the year-on-year percentage change of the value added has an average rate of fluctuation, which also refers to the Baltic States (Figure 3).



Source: author's construction based on Eurostat

Fig. 3. **Year-on-year percentage change of the value added at factor cost of the ICT sector at current prices in Baltic States**

The Latvian ICT sector's value added (entrepreneurship indicators) in 2015 was 896 m euro, i.e. 121.6% when compared to 2008 (Figure 4).

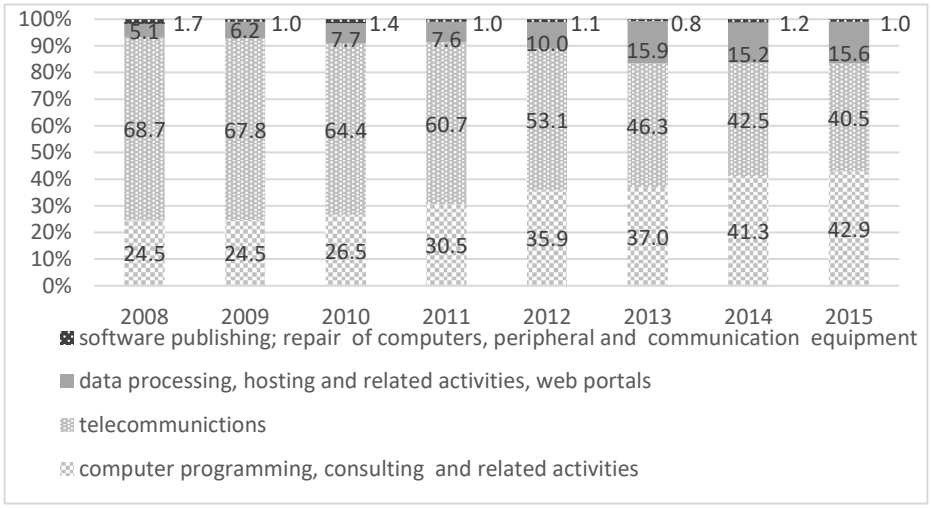


Source: author's construction based on Central Statistical Bureau of Latvia, Database

Fig. 4. **ICT sector's value added in Latvia, million euro**

Most of the value added comes from ICT services companies – 79.6% in 2015, followed by ICT manufacturing – 11.2 %, and ICT wholesale – 9.2%.

The added value proportion of the ICT sector in Latvia's GDP formed 3.8% in 2005 (Percentage of the ICT sector on GDP, value added at factor cost). From the changes in the added value of the Latvian ICT services businesses (Figure 5) since 2008 it follows that the share of telecommunications has considerably decreased (-28.2 %p), which can be explained by the increasing popularity of internet-based services and the growing demand that follows it; in addition, the number of businesses in software development is growing, which results in an increased value of other operations in the ICT sector.



Source: author's construction based on Central Statistical Bureau of Latvia, Database

Fig.5. **Added value of the Latvian ICT services businesses**

A tendency for increased value added has also been shown by computer programming, consulting, and related activities (+18,4%p) and data processing, hosting and related activities, web portals (+10,5%p).

ICT sector turnover in Latvia

The turnover of ICT businesses in Latvia reached 3462 million euro in 2015, i.e. an increase of 1.31 times compared to 2008 (Table 3). Most of the turnover was provided by ICT wholesale (47.9%) and ICT services (44.6%).

Table 3

Financial indicator - turnover - of the ICT sector enterprises; 2010-2014 (mln euros)

	2008	2009	2010	2011	2012	2013	2014	2015	2015/ 2008(%)
ICT Total	2625	1820	2067	2275	2897	3099	3063	3462	131.9
ICT manufacturing	77	74	87	102	123	147	182	258	335.1
ICT wholesale	1258	659	885	1010	1428	1524	1457	1659	131.9
ICT services	1291	1087	1096	1163	1346	1428	1424	1545	119.7

Source: author's calculations based on Central Statistical Bureau of Latvia, Database

The dynamics of the ITC sector turnover changes leads to the conclusion that the return to pre-crisis levels happened in 2012. During the crisis (2009-2011) the ICT turnover structure saw an increase of ICT services, which exceeded 50%, while the amounts and ratio of ICT wholesale decreased respectively. ICT manufacturing turnover has been growing recently, and in 2015 it reached 3.35 times the volume of 2008, which resulted in its total turnover achieving 7.5% of the total turnover in 2015.

Number of businesses in Latvia

Since 2008, the number of ICT enterprises in Latvia has grown by 2.4 times, and in 2015 it was 6180, most of which (in 2015), 87.8%, were ICT service providers, 10.4 % were in ICT wholesale, and only 1.8 % in manufacturing (Table 4).

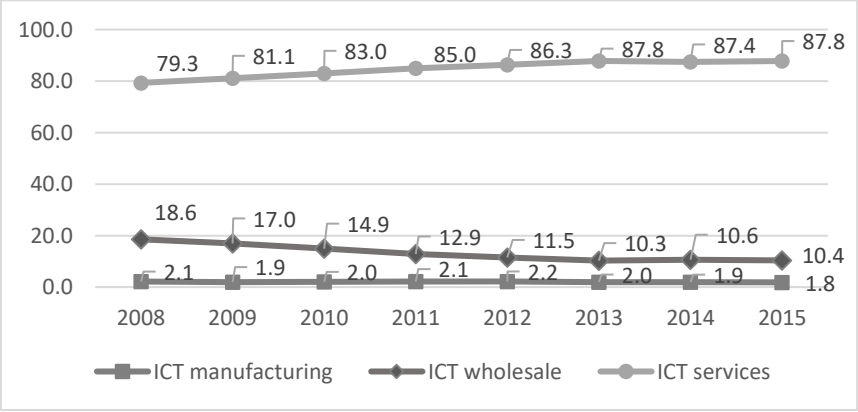
Table 4

Number of ICT enterprises in Latvia

	2008	2009	2010	2011	2012	2013	2014	2015	2015/ 2008, %
ICT Total	2560	2781	3151	3373	4390	5064	5432	6180	241.4
ICT manufacturing	55	54	64	72	96	99	104	114	207.3
ICT wholesale	475	472	471	434	506	521	578	641	134.9
ICT services	2030	2255	2616	2867	3788	4444	4750	5425	267.2

Source: Central Statistical Bureau of Latvia, Database, author`s calculations

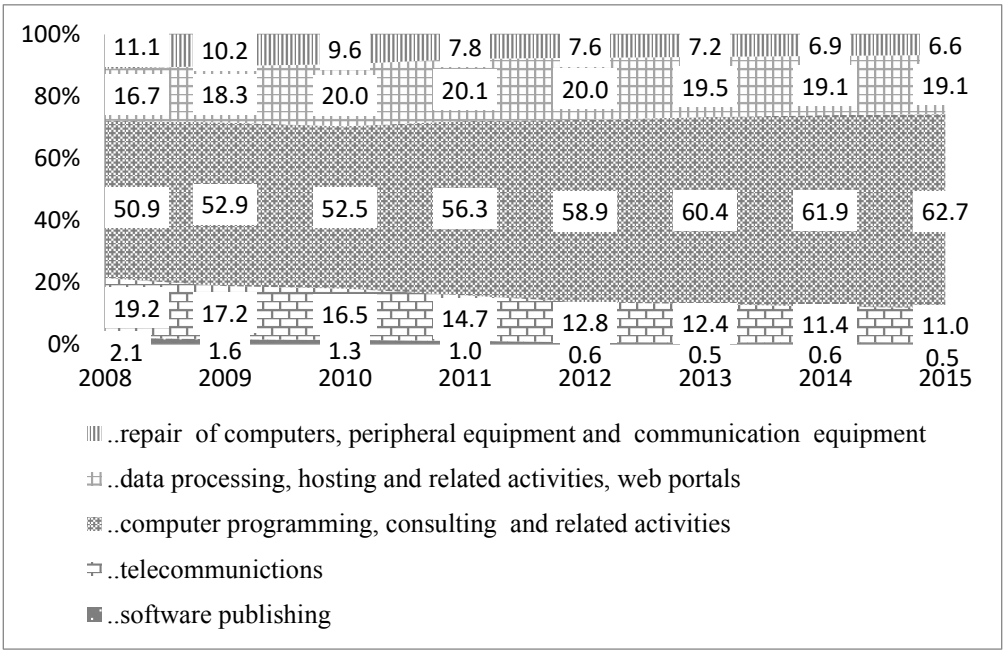
The most rapid increase in the numbers of companies was shown by ICT service providers (2.7 times), while it was the lowest in ICT manufacturing (1.3 times). Dynamics-wise, the most essential changes were in ICT wholesale and ICT services group (Figure 6), i.e. ICT manufacturing companies constituted 2% of all, the total number of ICT services enterprises grew and the number of businesses in ICT wholesale decreased.



Source: author's construction based on Central Statistical Bureau of Latvia, Database

Fig.6. **ICT services group, Latvia 2008-2015**

This indicates that the dominant form of operation in the ICT sector is ICT services, where 62.7% of the enterprises are in computer programming, consulting and related activities, and 19.1% in data processing, hosting and related activities, web portals (Figure 7).



Source: author's construction based on Central Statistical Bureau of Latvia, Database

Fig.7. **Operation in the ICT sector is ICT services, Latvia 2008-2015)**

Since 2008, the Latvian ICT structure has seen a decrease in the companies in repair of computers, peripheral equipment and communication equipment, telecommunications and software publishing.

In 2015, 94.9 % ICT sector businesses employ 0-9 of the employees, i.e. micro-businesses are predominant. Only 4.1% of those are small businesses (10-49 employees), and 1% large businesses (50 or more employees). Since 2008, the proportion of micro-businesses has grown by 7.3%, with the other two groups decreasing respectively.

Number of employees

The ICT sector in the EU employed 7734.4 thousand people in 2015; the EU average is 3.5% of the employed totals. The number of people employed by the ICT sector in the EU is between 1.2% and 6.5%, registered in Finland. The ICT sector of the United Kingdom, Netherlands employs 5.0%, Luxembourg – 4.6%, Estonia – 4.4%. In 12 of the EU countries, the ICT sector's share in the totals of the employed is lower than the EU average, including Latvia, where the ICT sector employs 2.2% or 19.2 thousand people, and Lithuania – 2,1%. Less than 2% of those employed by the ICT sector work in Romania – 1.9% and in Greece – 1.2%. It must be noted that a comparatively high contribution of ICT sector to the totals is also in Switzerland (4.8%) and Norway (4.3%), which do not belong to the EU (Eurostat). An assessment of the employment changes in the ICT sector shows that from 2008 to 2010 it was unchanged and began to grow in 2011. In Latvia, their numbers grew from 2010 to 2011 by 25.5%.

Calculations lead to the conclusion that out of 1000 employed aged between 15 and 64, in 2015, the EU ICT sector employed an average of 32.5, and the number has grown by 6 since 2008. The highest intensity of employment in the ICT sector was registered in Finland (60.2), followed by Sweden (58.2), the United Kingdom (48.6), Netherlands (47.3) and Luxembourg (43.8). Of the Baltic States, the most employed by ICT per 1000 of the total are registered in Estonia, which places it 6th among the EU countries, leaving behind a number of EU-15 countries. The indicator is similar for Latvia

and Lithuania, 20.1 and 19.5 respectively, ahead of Cyprus (19.1), Spain (18.7), Romania (18.2) and Greece (9.2). A generally lower intensity of ICT employment can be observed in the EU countries which joined after 2004.

Most of the ICT employees in the EU are male, i.e. in 2015, on average 84% of the employed, where the highest share of male employment was in the Czech Republic (90.1%). In Latvia, this ratio is one of the lowest (75.3%), only challenged by Romania (72.8%) and Bulgaria (72.3%). Since 2008, the proportion of male employees in the EU ICT sector has grown by 6.1%. The situation is similar in Latvia (from 69.4% to 75.3%), Estonia (61.7% to 79.7%) and Lithuania (from 56.0 to 79.9%).

Due to the specifics of the sector, ICT employs mostly people with tertiary education level – an average of 60.5% in the EU, and since 2008 the number has grown by 5.6%. Italy and Germany are the only countries where the ICT specialists by level of education non-tertiary do not exceed 50%. ICT specialists with tertiary level of education in Latvia - 65.0%, in Estonia – 58.0% and Lithuania – 79.8%, which is the highest in the EU. The number has grown in Latvia since 2008 by 7.1%.

On average, the proportion of EU ICT specialists aged up to 34 in the totals is (15 to 34 years, percentage) - 36.4%, while the greatest number of specialists of this age can be observed in Malta– 58.0%, followed by Lithuania - 55.3%, Bulgaria -54.6%, Latvia – 52.2%, Estonia – 52.0%. The fewest specialists aged up to 34 are employed by Finland (30.3%), Sweden (30.1%), Denmark (28.6%) and Italy (25.4%). Overall, the age of ICT sector's employees is lower in the EU countries which joined after 2004.

Conclusions, Proposals, Recommendations

The ICT sector development was the most rapid both in the EU and Latvia during the economic crisis. According to Eurostat, the greatest ICT contribution to the GDP was in 2014 in Malta, Sweden, the United Kingdom, Hungary, and Estonia. The data for 2013 shows that this group included also Finland and Denmark. Among the Baltic States, Latvia's indicators are lower than those of Estonia but exceed those of Lithuania. Between 2008 and 2014, the increase of the ICT sector in GDP in Lithuania, Latvia, and Estonia was the fastest in the EU. The fact that the growth of ICT in the total GDP of Latvia was relatively stable even during the economic crisis is a testimony to the ICT sector's potential for development and reaching the average level of the EU.

In the European Union countries, the greatest part (no less than 70%) of the ICT contribution to GDP is formed by ICT services. ICT manufacturing in the EU constitutes a much smaller portion, in some countries almost insignificant. This structure can be expected to persist, as the leading ICT business of the world are in the EU.

The added value (entrepreneurship indicators) produced by the ICT businesses in Latvia consist of 80% ICT services, 11% ICT manufacturing, and 9% ICT wholesale. Since 2008, the amount of telecommunications services in the ICT services sector has decreased noticeably because of growing popularity of internet services, as well as increase in the numbers of businesses developing new software, which causes other operations in the ICT sector to have higher value added. The areas showing a trend for increase in the value added structure in Latvia are computer programming, consulting and related activities, along with data processing, hosting and related activities, and web portals.

The number of ICT enterprises in Latvia is now 2.4 times that of 2008. 88% of that is constituted by ICT service providers, 10% are ICT wholesale companies, and only 2% are in manufacturing. The most rapid increase of the number of businesses is observed among the ICT service providers. ICT manufacturing claims around 2% of all businesses, the number of ICT service providers has grown, whereas that of ICT wholesale businesses has decreased. The dominant ICT

operations in Latvia are thus ICT services, with 62.7% of its businesses in computer programming, consulting and related activities, and 19.1% in data processing, hosting and related activities, web portals.

Since 2008, the structure of Latvia's ICT companies has seen reduced numbers of businesses operating in repair of computers, peripheral equipment and communication equipment, telecommunications and software publishing, and their numbers are likely to keep falling in the future, following the global ICT development trends. In terms of employment numbers, Latvia's ICT sector is composed of 95% microbusinesses, 4% small and 1% large businesses. In comparison to 2008, the numbers of microbusinesses have grown proportionally, whereas the next two groups largest in terms of the number of people employed have shrunk respectively.

The ICT sector of the EU countries employs on average 3.5% of the total numbers of the employed, ranging from 1.2% to 6.5%. In Latvia and Lithuania, the proportion of the employment by ICT sector in the total is twice as low as that of Estonia.

Both in the EU and Latvia, the numbers of employment in the ICT sector have been growing since 2011. On average, the EU ICT sector employs 32.5 per every 1000 of the employed. Among the Baltic States, the highest number of people employed by ICT per 1000 employed is in Estonia, the 6th highest in the EU, leaving behind even some of the EU-15 countries and far ahead of Latvia and Lithuania. The rate of the ICT employed is generally lower in the EU countries which joined later than 2004.

An average of 84% of those employed by the ICT sector in the EU are male. This rate is one of the lowest in Latvia, Lithuania, and Estonia (75-79 %). In line with the sector's specifics, 61% of the employed have tertiary education, in Latvia slightly more than the EU average - 65%.

An average ICT specialist in the EU is aged above 34, especially in the so-called old Europe, whereas in several countries, especially those that joined after 2004, the sector is dominated by younger employees, up to the age of 34, which also applies to Latvia, Lithuania, and Estonia.

The growth of the ICT sector in Latvia is an indication of the country's digital development in response to the challenges presented by the 21st century, and its rise as an economics sector, one whose importance in economy will only increase.

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DEMOGRAPHIC IMPLICATIONS OF THE RECENT REGIONAL AND COHESION POLICY DEVELOPMENTS IN LATVIA

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Abstract. Latvia has been characterised by low GDP per capita relative to the EU average, as well as large territorial disparities, notably between the capital Riga, central part and the rest of the country. Territorial differentiation is mirrored by the main demographic characteristics. Considering the shortage of national funding, national authorities, with the help of Integrated Territorial Investment principle, are channelling cohesion policy funding towards the development needs of weaker regions and specific local municipalities. With this in mind, the aim of the study is to analyse demographic implications in the course of recent regional and cohesion policy initiatives. Study results indicate that the revised regional and cohesion policy approach in 2014-2020 appear to be only partially in agreement with the general population views on the regional demographic challenges. According to the reviewed econometric model results, the cohesion policy activities planned for 2014-2020 period have a potential of bringing limited positive demographic change to the target areas, but fail to account for the possible spatial spillover effects of the investment.

Key words: *cohesion policy, regional demographic development*

JEL code: J11, J18, R11

Introduction

From the regional development perspective, Latvia can be characterised by strong inter-regional disparities, notably between the greater Riga region and the rest of the country. Similar situation is mirrored by the main demographic indicators of the entire country and its regions. Key socioeconomic concerns from a demographic development perspective, are low levels of private income per capita, high unemployment rates, intensive out-migration of economically active inhabitants and a rapidly ageing population (CSB, 2017).

An improved domestic legal framework and new regional aid measures intended to support structurally weaker areas have been introduced for the 2014-2020 cohesion policy planning period. Among many other issues, the new cohesion policy (CP) Operational programme (OP) “Growth and Employment” specifically identifies the current regional demographic challenges which Latvia faces on the regional level, and indicates various applications of the cohesion policy funding for either the alleviating some of these problems, or at least helping the regions to cope with the negative socioeconomic consequences of the demographic downturn. To better facilitate the needs of needs of weaker regions and specific local municipalities, national authorities are channelling substantial parts of the cohesion policy funding to the local administrative units using the new Integrated Territorial Investment principle.

Furthermore, in 2016, besides the new activities supported by the cohesion policy funding, several amendments to the national Municipal financial equalisation scheme were announced, along with the law establishing the new Latgale Special Economic Area.

Although the presence of some causal links between the regional aid measures and the local demographic dynamics have been previously theorised by many scholars (e.g. see Zvidrins, 2009; Klusener et al, 2012 or Dahs, 2016), the

formation and extent of these links have not been sufficiently researched. The pressing need to better understand relations between local socio-economic and demographic dynamics and account for it in the national and EU-wide regional policy response was repeatedly underlined by many recent studies, including those carried out by the European Commission (e.g. see Fesus et al, 2008). It is well known, that there is a limited amount of factors capable of influencing the socio-economic conditions on a regional level, and the direct policy actions carried out by the national or local government within the framework of the regional or cohesion policy are among the most important of these factors, and the only ones, which can be adjusted on a relatively short notice.

However, as it was demonstrated in the previously mentioned high-level reports produced by the European commission or the EPRC, in recent years such political reluctance to address the demographic issues is now largely disappearing as the alternative costs of inaction becomes increasingly evident. However, despite the hopes of political leaders for the quick and decisive effects of directed demographic policy interventions, individual studies carried out around the world show that all forms of demographic policy measures could have different effects in different institutional, cultural, or economic environments (e.g. see Boccuzzo et al, 2008). This realisation emphasises the role of regional demographic studies as the mandatory tools for tailored policy planning on the sub-national territorial levels.

The review of the limited amount of literature sources addressing the topic of corrective policy measures (e.g. Pol & Thomas, 2013; Gauthier, 2007 or McDonald, 2006) provides some basic understanding of the possible directions and scope of such policy activities. Furthermore, crude partition of the policy effects can be made along the lines of their temporal direction:

- Reactive policy measures, addressing those regional demographic problems, which have already manifested themselves;
- Proactive policy measures, attempting to strengthen or improve the existing regional demographic situation and / or avoid the predicted future challenges.

Both kinds of policy effects can focus on a variety of demographic processes ranging from fertility to family formation, or from economic activity to ethnic segregation. Of course, the spatial characteristics of the policy actions and their effects must also be taken into account, because such measures can be applied either in a nationwide context or on the regional level, targeting specific demographically challenged territorial units.

With this in mind, authors of this paper aim to evaluate the possible demographic implications of the previously mentioned innovations in the national regional and cohesion policy response. This is achieved by reviewing these changes in context of the population opinion survey results, as well as analysing the new support measures through the prism of econometric model estimations presented in recent publications on the demographic impact of regional and cohesion policy.

Research Results and Discussion

Considering the current state of play presented in the introduction, the following sub-sections of this paper contain the authors' interdisciplinary evaluation of the latest regional and cohesion policy activities in Latvia, using different tools and perspectives.

First, we briefly review the latest political inclinations concerning the regional demographic developments in Latvia by studying the contents of most relevant political debates at the national Parliament (Saeima). This is followed by a detailed review of the Integrated Territorial Investment approach of the national cohesion policy, as well as the overview of recent changes in the regional policy tools funded from the national budget.

Second, we attempt to evaluate these policy innovations through the prism of public opinion, by studying the results of a recently conducted survey on the inhabitants' perception of the demographic problems in the country, while paying particular attention to the indicate variance of opinions on the demographic problems and their possible solutions between the residents of different regions.

Third, using the results of the available econometric studies, authors demonstrate and discuss the complex picture of direct, indirect and spatially distributed demographic effects of the different types of socioeconomic factors and associated regional policy tools.

1. Policy Developments

Considering the above, we start by performing a content analysis of the meeting proceedings of the Latvian national Parliament (Saeima), accumulated during the 2013-2016 period. A recently developed search tool and repository of the Saeima debate records "Saeima Debate Corpus" was used for this particular part of the study (see Dargis et al, 2016). Using the aforementioned tool, authors were able to identify numerous occasions, when the regional demographic issues were referred to by the Members of Parliament (MP) and experts participating in the Saeima debates. By conducting the follow-up review of these debates, we associate them with two specific groups of demography-related issues having the inadvertent regional policy implications. Consolidated results of this analysis are provided in the Table below.

Table 1

Content analysis of the Saeima proceedings on population-related issues during 2011-2016

Event	**Year (approx.)**	**Notable references in the Saeima debates** *(Who? & When? / Topic / Context / Conclusions)*
Negative effects of depopulation, raise issues on demographic security and sustainability	2013-2016	J. Viļums [Latvian Association of Regions MP], January 2016/ - Depopulation as risk to national security/ - Regional policy should be focused on inhabitants/ - Dismissive reception by audience, emphasis on international cooperation for security and development.
		I. Parādnieks [All to Latvia - FF/LNNK MP], October 2016/ - Debate on 2017 state budget/ - Emphasis on links between personal income and family planning/ - Positive view of the newly-established Demographic Affairs Council activities/ - General support for the 2017 state budget proposal.
Development and introduction of the new regional and cohesion policy instruments for the 2014-2020 planning period	2014-2016	S. Šimfa [For Latvia from the Heart party MP], October 2015/ - Population structure and economic activity in the regions/ - Need for a "sustainable habitation policy"/ - Critics of the current "smart contraction" approach - Agreement on the need to strengthen the **role of local municipalities and businesses** for the sustainable regional population development.
		J. Viļums [Latvian Association of Regions MP], March 2016/ - Support to the creation of **Latgale Special Economic Area**/ - Emphasis on economic out-migration from Latgale region/ - Legal proposal accepted by majority.
		M. Kučinskis [Prime Minister], November 2016/ - Presentation of the new Government action programme/ - Focus on the links between socioeconomic factors, policy actions and demographic development/ - New view of demography – "natural process influenced by external factors and policy interventions"/ - Restrained positive reception by MPs.

Source: authors' elaboration based on Dargis et al, 2016.

The content analysis results indicate a growing political acceptance of the regional policy tools as viable instruments in addressing the regional demographic problems. However, the general understanding of these problems is still insufficient, as many MPs refuse to address them on par with other national security and sustainability challenges.

It has been already established that on the practical level, regional policy in general, and the schemes dealing with the regional demographic conditions specifically, remain largely reliant on EU cohesion policy co-financing. Since 2014, apart from the Financial Equalisation Mechanism and State budget transfers to local authorities, the biggest instruments funded solely from domestic budgets are tax relief in free-ports and special economic areas.

In order to align the available cohesion policy funding with the national and local regional policy needs in 2014-20, several innovative policy tools have been used. Most notably, these involve the Integrated Territorial Investments principle, as well as the use of cohesion policy funding in combination with other foreign aid instruments for the regional capacity-building schemes in the areas of entrepreneurship support and local infrastructure development. From the spatial perspective, according to the national guidelines territories of Latvia are no longer divided into more and less developed. Instead, it is set out that development opportunities should be available to every territory of Latvia and a joined approach to regional development must be applied. Nevertheless, it should be noted that within the framework of strategy "Latvia 2030", special attention is devoted to the investment support for so called "Spaces of National Interest", which, in the context of regional policy, are the national / regional development centres, rural development areas, Riga metropolitan area, and the Baltic sea coast alongside with the eastern frontier (see MoEPRD, 2013a).

In line with this strategic vision, the following two groups of municipalities are highlighted in the current regional policy response: "Development centres of national or regional importance" (9 cities and 21 town) and three "Target areas" (Coastal area, Eastern border area and Riga city area). In order to incorporate and prioritise support for the abovementioned areas in the regional policy response, the new "Integrated Territorial Investment" (ITI) approach was introduced. It allows the responsible government bodies to allocate the available cohesion policy funding for the selected projects of chosen municipalities, which are selected in accordance with the development needs and capabilities of the particular territories. In turn, these needs and capabilities are identified by analysing the local municipal development programmes (see MoEPRD, 2013b). Several Special Support Objectives (SSO) have been introduced under the OP "Growth and Employment" (most notably – SSO 3.3.1. and SSO 5.6.2.), aiming specifically at providing aid specifically for improving the socio-economic environment and infrastructure in the supported areas:

- For the cities and towns designated as the development centres of national or regional importance, ITI approach mainly provides opportunities for obtaining the cohesion policy funding for urban development.
- For the three Target areas, ITI framework outlines individual priorities for granting the cohesion policy funding:
  - Coastal areas: public infrastructure facilitating business development;
  - Eastern border area: infrastructure for accessibility, promoting economic activity, transit & logistics;
  - Riga city area: support for projects of national significance.

The main difference between the two ITI target groups is that the Development centres of national or regional importance can submit project proposals based directly on their own development programmes, while municipalities in the three Target areas have to meet the project objectives set for them by the national authorities (although, these objectives are defined for each of the Target areas on the basis of the municipal development programmes prepared by the local municipalities of the particular area and time period).

In addition to the changes in the cohesion policy approach, two particular novelties in the national regional policy framework should be mentioned – the improved Financial Equalisation Fund scheme and the Latgale Special Economic

Area. Under the 2015 law (see Municipal Financial Equalisation Law, 2016), a new calculation model was introduced to the Financial Equalisation Fund scheme, using new 'fiscal equalisation units' which base fiscal equalisation on average revenue (rather than financial necessity as in earlier years). In each fiscal year, the richest municipality is identified and set as a benchmark for all other municipalities. The closer municipality is to the benchmark, the smaller is the amount of financial aid for that municipality.

Aside from the financial equalisation scheme, the main domestically-funded instrument for specific areas is the Tax regime in Free Ports and Special Economic Areas which was most recently amended in May 2014. Enterprises in these areas (previously located only in Riga, Ventspils, Rezekne and Liepaja cities) benefit from various forms of tax relief on investment or income. A new Special Economic Area has been created in Latgale region in 2016, with the adoption of the relevant by-laws in June 2016. Contrary to the provisional estimates, the law does not define municipalities, whose specific areas would be set for special status. Instead, Latgale Planning Region Development Council is granted the decision-making authority on this matter (see Law on Latgale Special Economic Area, 2016).

2. Public Views

Having grasped the recent developments in the Latvian regional and cohesion policy actions, we can proceed by analysing the inhabitants' perceptions of the regional demographic problems and trying to learn how these correlate with the policy changes.

In 2016, within the framework of the Latvian National Research Programme project 5.2.4. "Economic Transformation, Smart Growth, Governance and Legal Framework for the State and Society for Sustainable Development: A - a New Approach to the Creation of a Sustainable Learning Community", a representative survey of the inhabitants' perceptions of current demographic challenges has been carried out. Survey included inhabitants of all Latvia's NUTS 3 regions and incorporated questions on migration and population growth. 2049 permanent residents of Latvia participated in this survey (667 respondents from Riga region, 357 from Pieriga region, 281 from Kurzeme region, 235 from Zemgale region, 208 from Vidzeme region and 301 from Latgale region). The obtained responses have been weighted in order to represent the actual population composition by gender, age and ethnicity in line with the Central Statistics Bureau estimations. Survey was conducted using direct interviews with residents aged 18-74 at 216 locations chosen throughout the country (up to 10 respondents at each location). Stratified random sampling method was applied in accordance with the regional population composition by gender, age and ethnicity. Findings of the survey concerning the inhabitant's views on the major factors contributing to solving the forthcoming demographic problems in Latvia are presented in Table 2 below.

Table 2

Major contributors to solving forthcoming demographic problems in Latvia (% proportion of answers)

	Region						All population
	Rīga	**Pierīga**	**Vidzeme**	**Kurzeme**	**Zemgale**	**Latgale**	
Family / Household	55.0	64.9	60.2	38.1	42.7	53.4	53.4
Government	52.9	39.3	30.8	71.0	40.6	72.8***	52.0
Self comes first	47.0	58.3	71.1	26.8	69.1	34.5***	49.7
Municipality	30.9	35.5	32.4	28.5	27.2	29.7	30.9
Attitude in working place	36.1***	27.3	20.4	13.5	22.6	11.7***	24.8
Parliament (Saeima)	21.1	14.7***	10.7***	13.7***	24.4	46.8***	22.1
Political parties	12.1**	3.7***	2.7**	3.4**	8.5	18.0***	9.0
NGOs	11.0**	7.9	8.8	3.5*	4.2	1.8***	7.1

Notes: n=2049, up to three answers are provided by each respondent. Significance codes: 0 ' *** ' 0.001 ' ** ' 0.01 ' * ' 0.05

Source: EKOSOC-LV Migration and Population Policy Survey – 2016.

From the survey results one can observe significant variation in perceptions among the inhabitants of different regions. Particularly interesting observations can be drawn from the different opinions on the role of the Government, Municipality and Self-reliance.

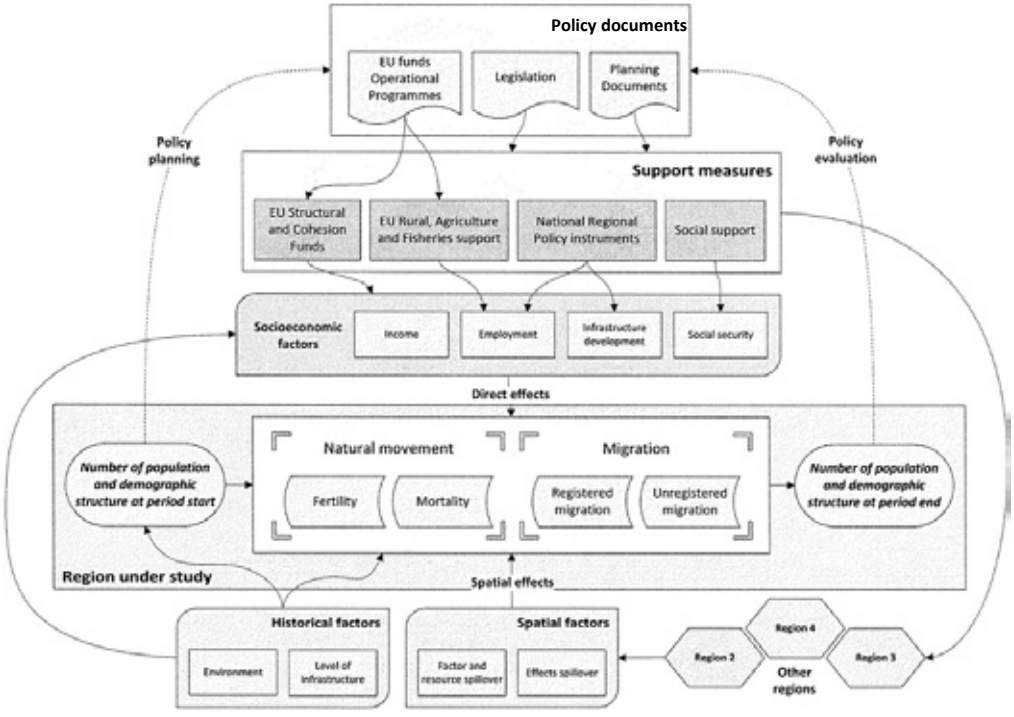
Residents of the Latgale region, lagging behind the national average in terms of socioeconomic development, consider the direct interventions and support by the national government and Parliament, along with the family support, to be the most significant drivers of positive demographic change, while placing little trust in municipalities or NGO's. Self-reliance indicators are also below average. This situation corresponds with the views expressed by some Parliament members outlined in Table 1. The establishment of the Latgale Special Economic Area may prove to be a popular idea among the local population, as this action fits with the public expectation of direct government actions.

On the other hand, inhabitants of the comparatively wealthier and more urbanised Riga and Pieriga regions rely more on themselves, their workplaces and households, as well as show comparatively higher level of trust in the actions carried out by their local municipalities. These views correlate well with the current cohesion policy actions aimed at improving the business-support infrastructure, raising employment and aiding local municipalities in implementing their own development programmes.

Other noticeable observations include an unusually high level of self-reliance among the inhabitants of mostly rural Kurzeme and Vidzeme regions as well as extremely low trust in the actions of NGO's and Political parties throughout the country.

3. Model-Based Evaluation

Considering the complex inter-relations of policy factors, support measures, spatio-temporal context and regional demographic development, which can be theorised based on the information presented in the previous sub-sections of this paper, as well as the studies on this topic (see Rivza, 1997 or Krisjane, 2005), authors propose building a schematic representation of the policy cycle model, highlighting the complexity and multi-layered nature of the demographic development process within one region (see Figure 1 below).



Source: authors' construction

Fig. 1. **Policy determinants of the regional demographic development – schematic representation**

Considering the multi-level structure of the interactions between the regional policy and regional demographic processes (see Figure 1), and the necessity to control for the inter-regional spillover effects between the local municipalities, the intended model-based assessment should employ a sufficiently complex econometric model, incorporating both direct and spatially-distributed effects of the factors under study. With this in mind, in order to draw further conclusions about the potential regional demographic implications of the new cohesion policy tools, authors use the results of Spatial Durbin Model (SDM) previously developed and estimated for similar purposes at the University of Latvia (see Dahs, 2016).

In general, SDM model incorporates the properties of more classical Spatial Lag and Spatial Error models; and therefore, fully captures spatially distributed effects of the processes ongoing in the neighbouring municipalities. The main difference about it is the replacement of the "unknown" spatial factors assumed by the SEM with the spatially weighted effects of the "known" impact factors. The classical spatial connectivity matrix (k=1) has been employed to capture the geographical structure of local municipalities.

The pool of independent variables comprise the average annual per-capita values of the EU Structural and Cohesion funds (CF, ESF, ERDF) including national co-funding, other EU funds (EFF, EAFRD, EAGF) including national co-funding, Foreign Direct Investment and municipal spending on social support and social security, as well as the average annual local unemployment rate in each municipality. Subject to the data availability, all figures are used for the period 2009-2013. The dependant parameters represent the change rates of the four regional demographic indicators (total population change, change in number of children (0-14), change of the Missing Registered Population share (representing the gap between declared population count and the actual estimated number of inhabitants) and change of the number of population due to registered migration in each municipality over the same period of 2009-2013.

The model estimation results relevant for this particular study are presented in the Table 3 below.

Table 3

Effects of regional investment / policy instruments on selected demographic indicators in 2009-2013

		Total pop. change	***<15 pop. change***	***MRP change***	***Pop. change due to reg. migration***
Direct effects	*Structural and Cohesion funds*	-0.00269 ‘	-0.00271	-0.00191 *	0.00033 ‘
	Other EU funds	0.00221 *	-0.00103	0.00045	0.00009
	Foreign Direct investment	-0.00014	-0.00044	0.00019	-0.00006
	Municipal social support spending per capita	-0.01354	-0.02827	0.00934	-0.00546 *
	Collected income tax per Capita	0.03456 ***	0.08428 ***	-0.00370 ‘	0.00153 **
	Unemployment	0.19273 ‘	0.70316 **	-0.03733	0.02908 ‘
Spatial effects	*Structural and Cohesion funds*	0.00161	-0.01102	0.00205 ‘	0.00041 ‘
	Other EU funds	-0.00338	0.00174	-0.00156	-0.00002
	Foreign Direct Investment	0.00123	0.00372	-0.00074 ‘	0.00000
	Municipal social support spending per capita	0.05663	0.07473	0.04897 ‘	0.01356 ‘
	Collected income tax per Capita	0.00054	0.00527	0.00063	-0.00007
	Unemployment	-0.12681	-0.32300	-0.06214	-0.02845

Significance codes: 0 ‘ *** ’ 0.001 ‘ ** ’ 0.01 ‘ * ’ 0.05 ‘ ’ ’ 0.1 ‘ ’ 1.

Source: Dahs, 2016.

Model estimation results support the "Self comes first" assumption expressed by many of the survey respondents and clearly indicate, that personal income and employment are the principal factors for the regional population development in Latvia, as high personal income level and stable work conditions are crucial for ensuring the necessary level of healthcare, quality of life and other conditions facilitating positive demographic dynamics. Further, model estimations help determining that in terms of regional demographic change, European Structural and Cohesion funds may have moderately significant direct and partly significant spatially distributed impact on the migration-related demographic processes. The per capita spending of rural development and agriculture-related funds (EFF, EAFRD, EAGF) has some

limited impact on the total population change, due to the role of these investments in the development of rural or coastal areas.

The analysis of spatial interactions indicates noticeable spatial spillovers of the EU Structural and Cohesion funds in relation to the population change due to registered migration. Similar conclusion may be drawn concerning positive spatially distributed effect of the EU Structural and Cohesion funds on the reduction of missing registered population. These observations are particularly important in the context of the new cohesion policy ITI approach, as it does not anticipate the estimated spatial spillovers of the investments and their resulting demographic effects between the neighbouring municipalities. However, this particular issue could be addressed with relative ease by introducing more elaborate requirements or plans for the municipalities' social and economic integration with the relevant local or national development centres.

Municipal social support spending per capita has demonstrated mixed results, which was expected, considering the complex nature of the social protection issues and various reaction of the regional populations to the deviations of the social support policy models (e.g. see Athanasenas et. al., 2015).

One can also observe a positive spatially distributed effect of the Foreign Direct Investment, which may be linked with the development of the local business infrastructure and particularly – the Special Economic Zones. The presence of spatial component is not surprising as the level of complexity and completeness of business infrastructure has been previously linked with the quality and living standards of regions' population in post-Soviet countries (see Sibirskaya et. al. 2015).

Conclusions

1. In recent years, in terms of the regional demographic development, the national regional policy response has become much more pragmatic and goal-oriented. A much greater emphasis is placed on the role of the individual municipalities and their own development programmes, while the cohesion policy funds are identified as the main sources of funding for regional change and / or adaptation.
2. It is possible to conclude that Latvian national regional and cohesion policy still lacks a unified approach towards the regional demographic issues. Although, insufficiently recognised at the legislative level, demography is considered among the main regional development challenges at the regional and cohesion policy implementation level. Both proactive and reactive measures can be identified in the policy programmes. Growing role of individual municipalities in the decision-making processes facilitates a more tailored approach, allowing the demographically challenged regions to plan their own means of dealing with the situation, by adapting and restructuring their internal socioeconomic environment.
3. Study results indicate that the revised regional and cohesion policy approach appear to be only partially in agreement with the general population views on the regional demographic challenges. Most noticeable disagreement can be observed between policy-makers' and public views on the role of local municipalities in addressing the regional development problems. However, some of the new aid measures seem to be more in line with the opinions expressed by the representatives of Riga and Pieriga regions. The establishment of the Latgale Special Economic Area could prove to be a popular idea among the population of this region, because this scheme corresponds with the high public expectation of direct government actions.
4. According to the reviewed econometric model results, the cohesion policy activities planned for 2014-2020 period under the Integrated Territorial Investment approach, have a potential of bringing limited positive demographic

change to the target areas, but fail to fully account for the possible spatial spillover effects of the investment, which could be achieved by greater focus on territorial integration with the local or national development centres.

Acknowledgments

Materials on the Latvian regional and cohesion policy change provided in this paper were produced over the 2014-2017 period by the researchers of the Centre for European and Transition Studies at the University of Latvia: Tatjana Muravska, Jānis Aprāns, Aleksandrs Dahs and Jelena Malikova, within the framework of the international research project "The Objective of Economic Cohesion in the Economic Policies of EU Member States" managed by the European Policies Research Centre (EPRC).

This paper was supported by the Latvian National Research Programme project 5.2.4. "'Economic Transformation, Smart Growth, Governance and Legal Framework for the State and Society for Sustainable Development: A - a New Approach to the Creation of a Sustainable Learning Community"' (EKOSOC-LV).

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POST-CRISIS EVOLUTION AND CHALLENGES OF THE BANKING SECTOR: THE CASE OF LATVIA

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Abstract. The economic crisis revealed a number of problems in the banking risk management. The Basel III Agreement calls for the strengthening of bank's capitals, the increase of liquid assets, and the reduction of overall level of risk of the banking activities. Because of that many authors believe that a full adoption of Basel III will contribute to a greater financial stability of banks and reduce bank profits, as well as their profitability. However, in Latvia, in the post-crisis years, an increase of banks' profits has been observed.

In this article, the development of Latvian banking system in the post-crisis period in comparison with pre-crisis tendencies is analysed. The bank profitability indicators, the level of bank capital adequacy, liquidity and the credit activity are assessed. The author evaluates the reasons for bank profits and profitability increase, and appraises the sustainability of this tendency.

The purpose of this research is the evaluation of the post-crisis development of the Latvian banking system and the impact of the Basel III Accord on the further development of the banking sector in Latvia.

In order to establish a causal link between the profitability of banking activities and the level of bank capital adequacy, liquidity and lending rates of growth, the author constructs a VAR model. The author also assesses the sensitivity of key bank profitability indicators, using the analysis of impulse responses.

The analysis reveals that profitability increase has short-term character, but full implementation of the Basel III Accord will be associated with the reduction in the bank profitability.

Keywords: *bank profitability factors; Basel III, Financial crisis.*

JEL code: G210

Introduction

The events originating in 2007 missed no country and revealed those risks and problems which had not been paid due attention before the crisis. The crisis proved that risk management in commercial banking sectors in almost every country of the world requires improvement: in the pre-crisis period aggressive bank activities were occurring in the credit and financial instrument markets, banks were overly optimistic and careless in analyses of the future of debtors.

The financial crisis of 2007-2009 was analyzed by many researchers all over the globe: Calluzzo P. and Dong G.N., (2015) find that while financial institutions have become less risky individually after the crisis, the financial market has become more vulnerable to systemic contagion; Wehinger G., (2014) examined provisioning policies during the recent financial crisis; Steven, (2009) asserted that one of the reasons for the global financial crisis was the inadequate bank capital; Davis K., (2010) noted the number of the deficiencies in the capital adequacy regime, revealed by the global financial crisis; Kudinska M. at al, (2008) assessed liquidity of the Latvian banking system in the pre-crisis period; Kudinska M., (2012) assessed changes in financial leverage level in banks of Baltic countries, clarified mechanisms of banks financial leverage impact upon stability of the banks themselves and upon economy in general, as well as developed recommendations for financial leverage management in order to dampen adverse economic changes.

In December 2010, the Basel III Accord was endorsed - a comprehensive set of reform measures in banking prudential regulation developed by the Basel Committee on Banking Supervision to strengthen the regulation, supervision and risk management of the banking sector. Basel III's focus is on capital and funding. Many authors believe that a full adoption of Basel III will contribute to a greater financial stability of banks and reduce bank profits, as well as their profitability (Härle P.at al, 2010; Prado S.M. and Zhao S., 2014; Gual J., 2011; Edvards J. at al, 2010). For example Prado S. M. and Zhao S., (2014) showed, that banks will experience higher pressure on their return on equity (ROE) due to increased capital and liquidity costs. (Bandt O., 2014) recognized that Basel III imposes an increase in capital quality by requiring higher levels of common equity. Such capital requirements could, however, create tradeoffs for the economy. Banks often argue that higher capital requirements will jeopardize their performance. This could occur, for example, if banks' cost of financing were to increase significantly due to more capital holding. These higher funding costs could result in lower ROE for banks and have a disruptive effect on lending. Gavalas D. (2015) considers that assuming a 1.3 percentage point increase in the equity-to-asset ratio to meet the Basel III regulations, the country-by-country estimations imply a reduction in the volume of loans by an average 4.97 percent in the long run for the banks in countries that experienced a crisis and by 18.67 percent for the banks in countries that did not experience a crisis. Sutorova B. (2013) assumes that the impact of a one percentage point increase in the common equity ratio should lead to an increase in lending rates of only 18.8 basis points, and the elasticity of demand for loans in the EU is reported to be relatively low.

Basel III will have significant impact on the European banking sector. Based on Q2 2010 balance sheets, by 2019 the industry will need about €1.1 trillion of additional Tier 1 capital[1], €1.3 trillion of short-term liquidity, and about €2.3 trillion of long-term funding, absent any mitigating actions. The capital need is equivalent to almost 60 percent of all European and US Tier 1 capital outstanding, and the liquidity gap equivalent to roughly 50 percent of all outstanding short-term liquidity. Basel III would reduce return on equity (ROE) for the average bank by about 4 percentage points (Härle P. at al, 2010).

However, in Latvia, in the post-crisis years, an increase of bank profits has been observed. It is necessary to evaluate the reasons for bank profits and profitability increase, as well as to appraise the sustainability of this tendency.

The purpose of this research is to evaluate the post-crisis development of the Latvian banking system and the impact of the Basel III Agreement on the further development of the banking sector in Latvia.

1. Evaluation of The Main Bank Activity Indicators

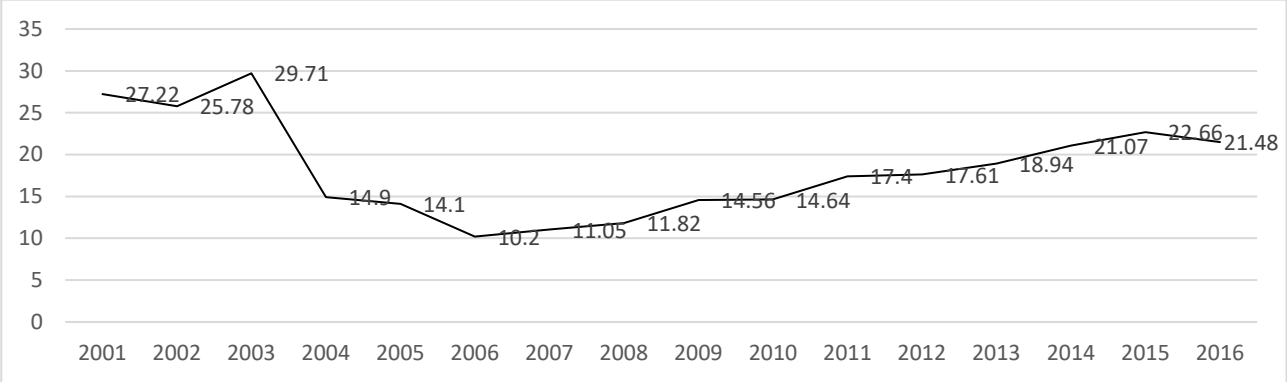
At first, the author analyzes the dynamics of the main bank activity indicators, evaluating the changes between the pre-crisis and post-crisis periods.

Capital adequacy. The main indicator of bank reliability is capital adequacy. On the capital side, banks must have a certain amount and the type of capital which is categorized based on its ability to absorb all of bank's losses.

Dynamic of bank capital adequacy at Latvian banks in 2001 to 2016 is shown in chart in Fig. 1.

In pre-crises period, from 2001 to 2006, the standard deviation of capital adequacy ratio was economical insignificant – 1.6%, banks worked with small capital strength.

[1] Tier 1 capital is the core measure of a bank's financial strength from a regulator's point of view.



Source: author's construction based on FCMC[2] data

Fig.1. **Dynamic of bank's capital adequacy of the Latvian banking system in 2001 to 2016, per cent.**

Since within crisis period the commercial banks restricted their risky transactions, also tightening their crediting policies, while carried out the loan provisions at the expense increase in equity capital, a slight growth in capital adequacy took place in banking system.

Table 1.

Summary statistics for bank capital adequacy at Latvian banks for the period from 2001 to 2016, (in %).

Statistical value	**Before crisis time (2001-2006)**	**Crisis time (2007-2009)**	**After crisis time (2010-2016)**
Average	15.41	14.93	20.80
Min	8.06	8.30	8.37
Max	31.00	58.94	75.1
Mode	19.00	12.00	13.8

Source: author's calculations based on Bank's Annual Reports.

The minimum value 8.06 of the capital adequacy ratio in the pre-crisis period (Table 1) evidences that some banks have been working at the edge of the capital adequacy limit. At the same time, the capital adequacy is one of business growth sources (Borio C., Furfine C., Lowe P., 2001).

Statistical values of bank capital adequacy allow concluding that during the pre-crisis period the capital adequacy had procyclical nature: the capital adequacy was higher during the economic growth periods and lower during the economic slump. The procyclicality of capital adequacy in the pre-crisis and crisis period was observed in many countries. This is the subject on numerous studies (Rosenberg J. and Schuermann T, 2006; Athanasoglou P. and Daniilidis I., 2011; Neville A., 2009; Repullo R. and Suarez, J., 2013; Kashyap A. and Stein J., 2004; Gordy M.B. and Howells B., 2006).

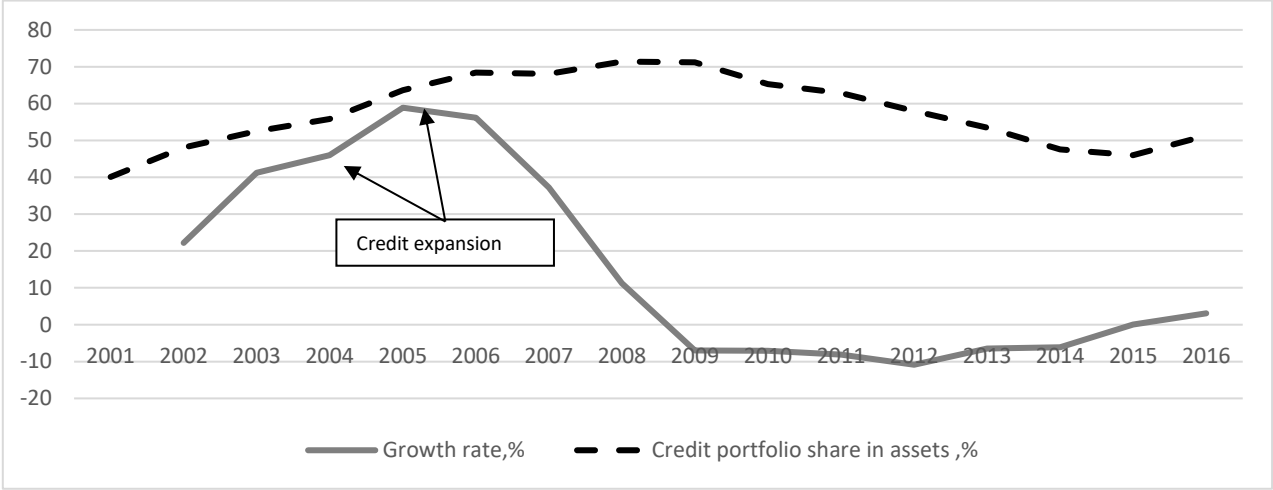
Following the financial crisis, the Basel Committee on Banking Supervision was working in order to improve the overall quality of bank capital through a set of changes in the capital adequacy framework (BIS, 2011), also addressing the pro-cyclicality issue. Right now the procyclical nature has not been observed, as the capital adequacy is increasing in accordance with the higher requirements for capital stipulated by Basel III.

Lending activity. In Latvia, the main cause of the crisis was the overheating of economy associated with excessive lending and over-reliance on the real estate market. Development of credit portfolio share in assets of banks is shown in chart on Fig. 2. In periods of time, such as during the period of credit expansion 2004-2006, the specific weight of loans

[2] FCMC – The Financial and Capital Market Commission is an institution, which carries out the supervision of Latvian banks.

in banks' assets was above 70%. Loan portfolio of Latvian commercial banks was in the rice at a speed of +49% per year in 2004, +58% per year in 2005 and +59% per year in 2006 (see Fig.2).

Nowadays, the bank's credit portfolio has a pronounced downward trend. At the end of the 2016 the credit portfolio of Latvian banks was 38% smaller than at the end of 2008. Credit portfolio growth rates started increasing tendency. It could be said with fair amount of certainty that also in the near future this trend will continue.



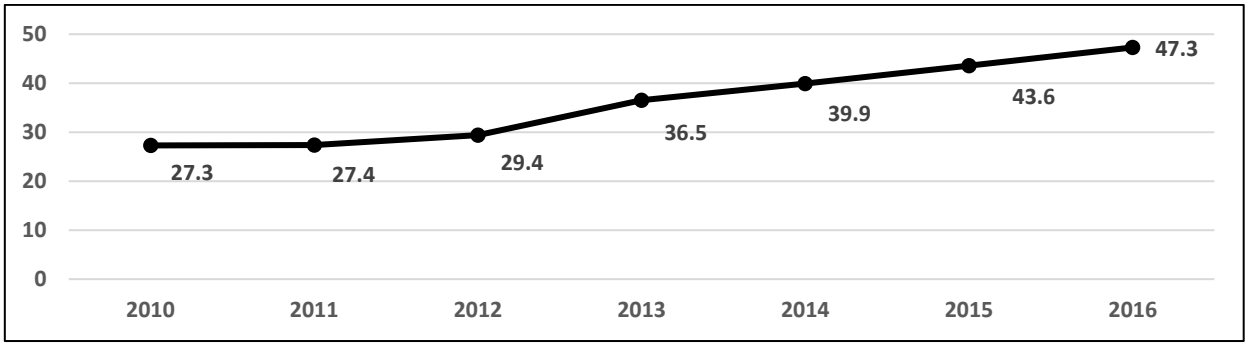
Source: author's construction based on FCMC data

Fig.2. **Credit activity indicators of Latvian commercial banks in 2001-2016, per cent**

It should be noted that the low growth rates of residents' loans do not contribute to the growth of investments and long-term development of national economy. In the segment of crediting the non-residents influenced by external political and economic factors an increase in credit risks is expected. These risks are vital for banks that have a significant percentage of capital as foreign investments. That is why banks serving the non-residents the Financial Market regulator - Financial and capital market commission (FCMC) has set higher requirements for bank capital adequacy.

Liquidity. Liquidity of the global banking sector has also undergone a major negative impact during the crisis. Decline in liquidity contributed to deterioration of asset quality, rising distrust of credit institutions from creditors – both private and corporate. In order to ensure the availability of funds for credit institutions the refinancing rate has been unprecedentedly lowered in many countries. Extremely low loan interest rates of central banks still persist today. The same level of interest rates is apparently expected in the short term, as well.

In the post-crisis period there Latvian commercial banks have experienced a steady upward trend in the increased share of liquid assets in the total bank assets (see Fig.3.). This is facilitated by several factors: firstly, strict credit conditions and as a result - a decline in demand for loans; secondly, the political and economic instability in the region of debtor activities (for non-resident credits), higher requirements from supervising authorities to the bank liquidity level and stress – scenarios results implementation etc.

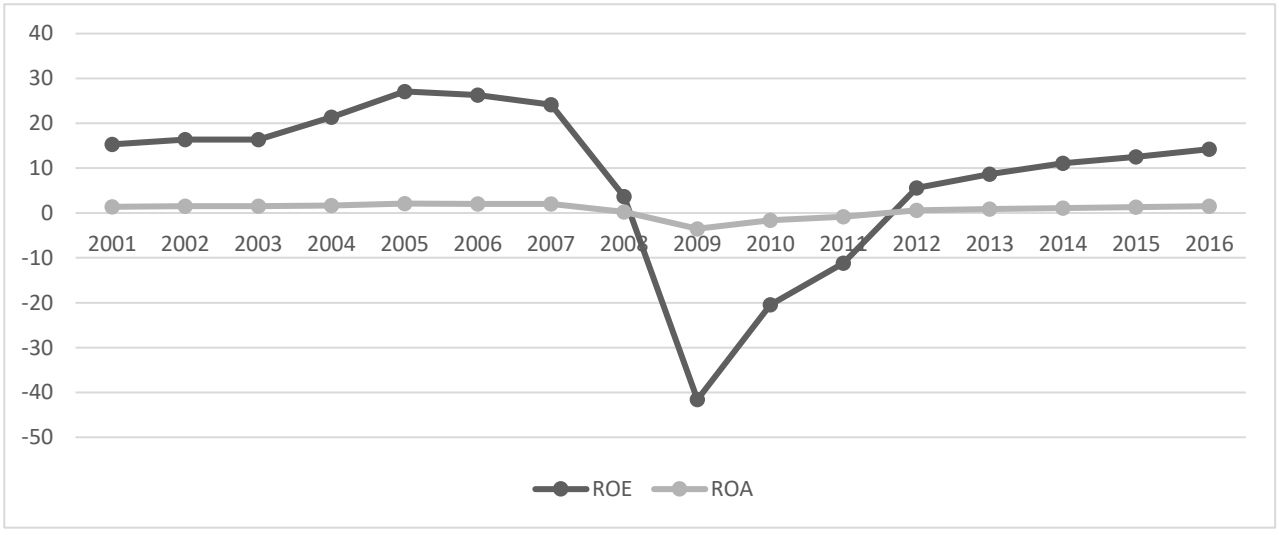


Source: author's construction based on FCMC data

Fig.3. **Share of liquid assets in total assets of Latvian banks in post-crisis period (2010-1016, in %).**

At the same time, some commercial banks also currently have a low level of liquid assets. Thus, according to the quarterly statistics of some commercial banks, in 2016 considerable variation was observed in the value of the liquidity ratio[3] in the industry, the standard deviation being 18.83%, the highest level - 108.01%, the minimum - 37.18%. Adopted agreement Basel III has proposed to introduce two new indicators regarding liquidity: *Liquidity Coverage Ratio* (LCR) – to provide short-term liquidity and *Net Stable Funding Ratio* (NSFR) – to regulate long-term stable funding (BIS, 2013, BIS 2014). The LCR ratio came into force on October 1, 2015, and currently stands at 70%. It is envisioned that by 2019 the figure will increase to 100%. Thus, even a greater growth is expected in the share of liquid assets in bank balance sheets. The NSFR indicator is the ratio of the required and available stable funding. Complete introduction of this indicator is expected by January 1, 2018. For Latvian banking sector the inconsistency problem of long-term available and required funding before the crisis was extremely relevant. The author of this article conducted a research in 2008 on the subject of unbalanced liquidityand found out that during the pre-crisis period 40(!)% of short-term deposits and deposits on demand of separate banks were funds for long-term loans. (Kudinska M. at al, 2008). To fulfil the requirements of NSFR that will be strategically focused on long-term investment funds, banks will be forced to think about borrowing long-term funds. The author assumes that more and more long-term and medium term debt financial instruments will appear in the financial market.

Profitability indicators. Another group of indicators, the changes in which are considered by the author in this article, is profitability ratios. All experts and researcher claim that full implementation of Basel III will lead to reduce bank profitability. In the mean time in the Latvian banking system the banks show a positive trend changes in profitability. By the end of 2015 only 2 banks out of 17 did not have a positive financial result of their activities, the most profitable banks were (AB.LV (27.76 – ROE, 1.49 – ROA), Latvijas Pasta banka (29.53 – ROE, 2.52- ROA), Rietumu banka (20.31- ROE, 2.05 – ROA). By the and of 2016 all of Latvian commercial banks had positive financial result of their activities. the most profitable banks were (Latvijas pasta banka (42.78-ROE, 5.19-ROA), AB.LV (27.26 – ROE, 1.85 – ROA), Rietumu banka (18.98- ROE, 2.44 – ROA).

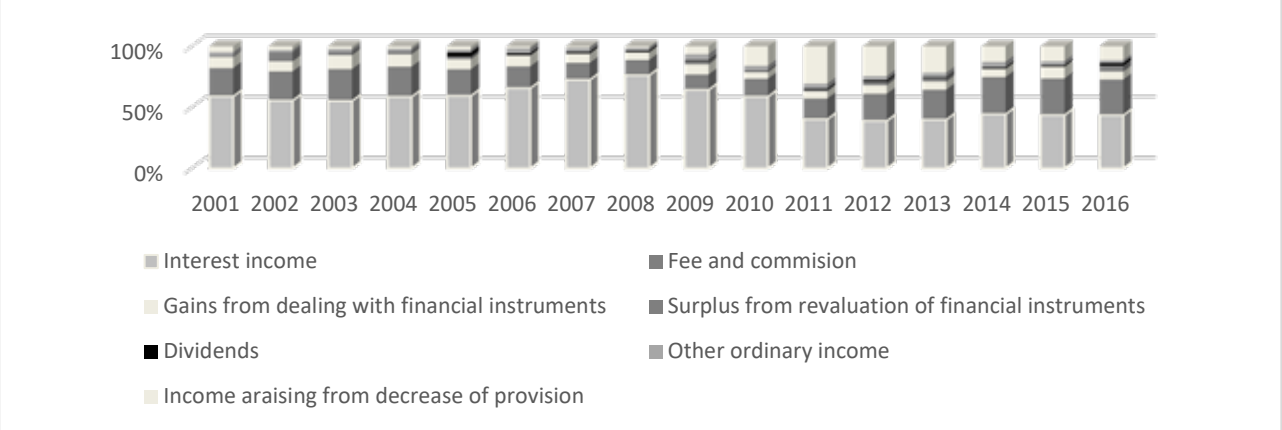


Source: author's construction based onFCMC data

Fig. 4. **ROE and ROA ratios of Latvian commercial banks in 2001 to 2016, per cent**

[3]Liquidity ratio is determined as the level of liquid assets against current liabilitiesofbanks;FCMC requires min 30%

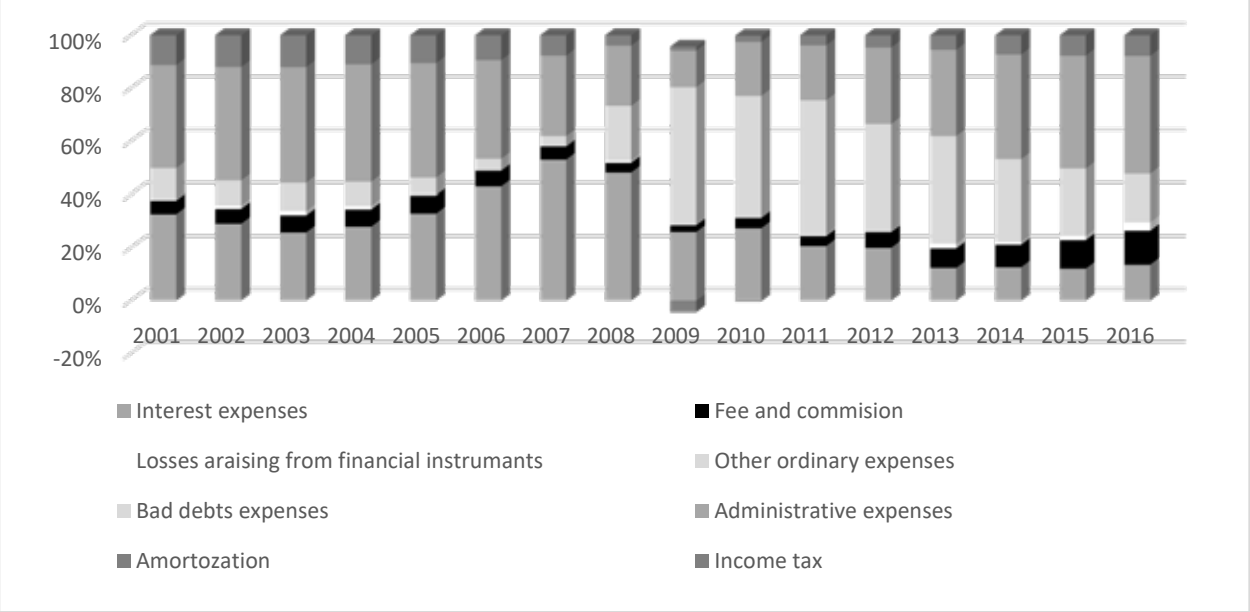
The previous analysis showed that lending rates are decreasing, liquidity level is decreasing, so the following question is more than logical: what kinds of factors determine the profitable growth of banks and how stable are these trends? The next two graphs illustrate the structure of incomes and expenses in the banking industry.



Source: author's construction based on FCMC data

Fig. 5. **Incomes structure of Latvian commercial banks in 2001 to 2015, per cent**

In the structure of incomes (see Fig.5), in addition to the interest income and commission fees received, it is necessary to note the growth in income from trade in financial instruments and incomes from reduction in loan provision. Growth in income from trade in financial instruments is associated with financial instruments portfolios increasing. The incomes from reduction in loan provision are associated with return loans written off in times of crisis. In 2015, 12% of all incomes were derived from reduction in loan provision. The expenses pattern of banks demonstrates growing administrative costs, reducing accumulations and slightly increasing commissions paid (see Fig.6).



Source: author's construction based on FCMC data

Fig. 6. **Expenses structure of Latvian commercial banks in 2001 to 2016, per cent**

Based on the previous analysis, the author assumes that the post-crisis development of the Latvian banking system is associated with capital straitening, credit activity and loan provision decreasing and liquidity assets increasing.

2. Causal link modeling between ROE and the level of bank capital adequacy, liquidity and lending activity

The author put forward the hypothesis that significant factors of bank ROE (roe) are: capital adequacy (*capad*), the share of loans in the total bank assets (*cred*), liquidity (*liq*) and reduction of provisions for bad loans (*prov*). The hypothesis checked by using multivariable regression analysis. In order to reduce the spread of values, were taken logarhythms of variables: *capadlog, credlog, liqlog* and *provlog*. There is an unlogarhythmic variable ROE, as there are negative values.

To establish the relationship between return on capital and the capital adequacy level, liquidity and share of loans in the total bank assets, the author constructs a VAR model. This model contains FCMC data for the period from 2001 to 2016 with a quarterly breakdown. To check stationarity of time series data the author made ADF test. P-value's for all variables are significant. On the table 2 are shown group unit root test results.

Table 2

Estimation of Augmented Dickey-Fuller Unit Root test (ADF)

Method	Statistic	Probability**	Cross-selections	Obs.
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-2.73157	0.0032	6	380
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-4.69735	0.0000	6	380
ADF - Fisher Chi-square	53.0788	0.0000	6	380
PP - Fisher Chi-square	58.8182	0.0000	6	380

Source: author's calculations

P-values for all variables are significant. With probability higher than 5% we can conclude that time series are stationary and we can use them for modelling. Residual tests (Normality, Hereroskedasticity, Correlograms) are made. Author assumes that capital adequacy (*capadlog*) influences the lending activity *(creditlog)*, and the lending activity *(creditlog)* has an impact on liquidity *(liqlog)* and bank return on capital *(roe).* Then for VAR modelling the time series were ranged in such order: *capadlog*, *creditlog,liqlog*, *roe*. Next table characterizes VAR Model coefficients (see Table 3).

Table 3

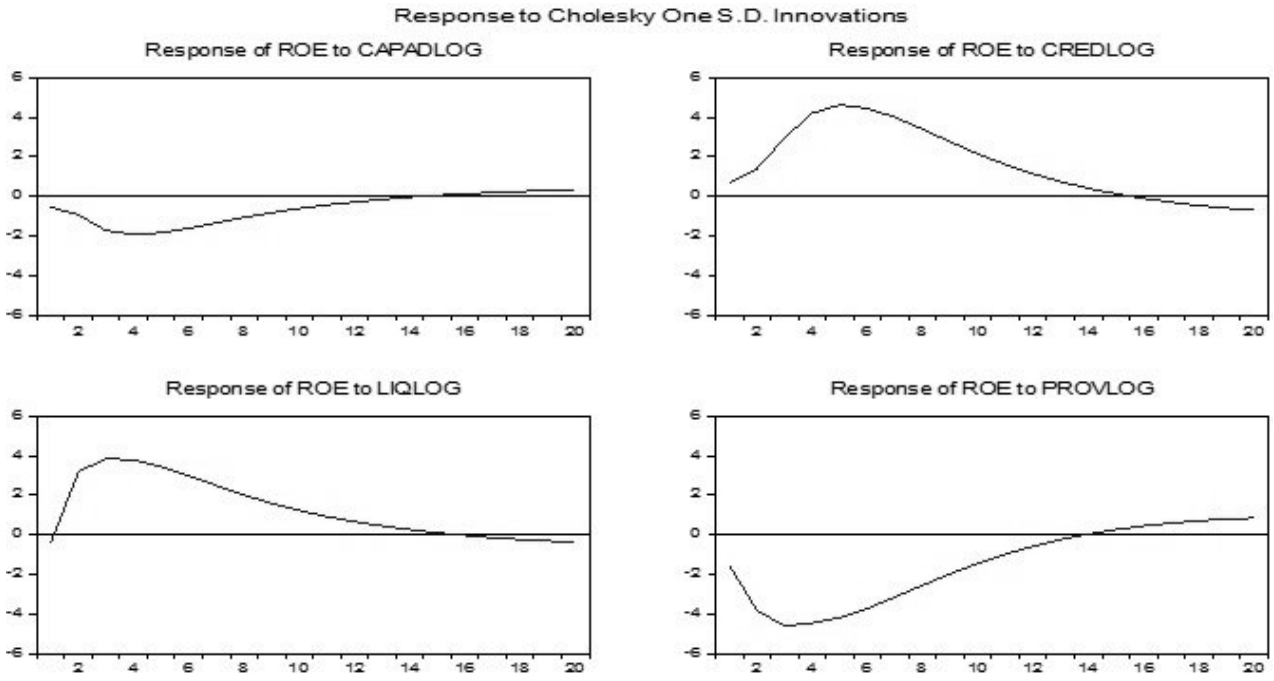
VAR Model coefficients

	VAR Model coefficients					
R-squared	0.882374	0.414522	0.877350	0.985872	0.916324	0.882374
Adj. R-squared	0.854368	0.275123	0.848148	0.982508	0.896401	0.854368
Sum sq. resids	0.358649	0.161530	0.063931	0.956858	1532.566	0.358649
S.E. equation	0.092408	0.062016	0.039015	0.150938	6.040668	0.092408
F-statistic	31.50641	2.973628	30.04390	293.0840	45.99334	31.50641
Log likelihood	57.18241	78.32023	102.8825	31.17766	-164.3605	57.18241
Akaike AIC	-1.742733	-2.540386	-3.467265	-0.761421	6.617378	-1.742733
Schwarz SC	-1.333804	-2.131458	-3.058337	-0.352493	7.026307	-1.333804
Mean dependent	2.638584	0.044324	4.056069	0.920429	9.181132	2.638584
S.D. dependent	0.242148	0.072840	0.100120	1.141256	18.76749	0.242148

Source: author's calculations

Author analyzed impulse response functions as a result of the VAR Model. The results of impulse response for 5 years are shown in Fig.6.

ROE response is substantial to all indicators shocks: loan portfolio shocks, provision shocks, capital adequacy shocks and liquidity shocks. The most significant changes in ROE created by lending activity shocks and liquidity shocks. The reversions to the starting levels of analysed indicators are observable more than one year after the shocks. Made research proved that all analyzed bank activity indicators are significant for the bank's profitability and since Basel III implies growth of capital adequacy, decrease of loan activities and growth of liquid assets, than full adoption of Basel III will reduce subsequently the bank profitability.



Source: author's construction

Fig.6. **Variables response functions**

The Latvian banks cannot ignore that the rise in profits due to reduction in provisions is not a long-term trend. Author considers that in light of the new regulations Latvian banks have to review the profitability of current businessesincluding rationalization of branch structures, as well as prepare to exit low-profit and low-growth business entities and review the risk politics and procedures.

Conclusions and Recommendations

1. Analysis of pre-crisis and post-crises evolution of the Latvian banking system has revealed thatduring the pre-crisis period the capital adequacy of Latvian commercial banks had procyclical nature. Right now the procyclical nature has not been observed. Banks demonstrate stable dynamic of capital ricing. Capital adequacy is increasing in accordance with the higher requirements for capital stipulated by Basel III.
2. In nowadays interest rates are extremely low. It means that incomes from lending activity are decreasing.
3. In the post-crisis period Latvian commercial banks have experienced a steady upward trend in the increased share of liquid assets in the total bank assets. Some commercial banks also currently have a low level of liquid assets.
4. In nowadays the Latvian banks show a positive trend changes in profitability. VAR analysis approved that capital adequacy, the share of loans in the total bank assets, liquidity and reduction of provisions for bad loans are the

significant factors of bank ROE . The most significant changes in ROE created lending activity shocks and liquidity shocks. Basel III imposes an increase in capital quality, lending decreasing and liquidity increasing. This means that full adoption of Basel III will reduce bank profits, as well as their profitability.

5. Latvian banks have to review the profitability of current businesses including rationalization of branch structures, as well as prepare to exit low-profit and low-growth businesses and review the risk politics and procedures.

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CUSTOMER PRIVACY CONCERNS AND PRIVACY PROTECTION PROBLEMS IN THE CHANGING NATURE OF CRM

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Abstract: In order to stay ahead of the competition companies are more and more forced to turn their attention to the real assets: their customers. Both, the value of the individual customer and the development of personalized relationships with them have made customer relationship management one of the emerging topics in the last years.

Companies increasingly collect and use data about their existing and potential clients with the purpose to improve their customer relationship management (CRM), productivity, and client service. That process helps companies' to build up their own customer data base with the purpose of strategic decisions making as well as customer relationship enhancing.

This paper briefly reviews the difficulties that privacy concerns are creating for the growth of small and medium-sized businesses and customer relationship management (CRM).

The paper introduces the concept that the changing nature of the consumer power is an essential element in ensuring the success of relationship building. This paper aims to increase the understanding of the necessity of data collection in order to keep strong relationships with the customer, on the same time keeping all available data save and protected what increases clients trust to the company.

The main results and findings of this report is the illustration of what should be done to leverage between the data collection from a customers and a privacy concerns.

The following methods were used – literature study and analysis, surveys study.

The research results can be used both theoretically and practically in respect of taking into account described consumer power in the changing environment and modifying thereof the concept of customer relationship management in the company.

Keywords: *CRM, Privacy, Loyalty*

JEL code: M1, C01

Introduction

In today's changing and fast developing business environment the small and medium-size organizations of business faces various critical challenges to keep the competitive market position and to respond to the changes in the globalization, which provides wide range of opportunities to the organizations. There could be seen that especially small and medium-size companies during last years have shifted their focus from the product oriented organizations to the customer oriented organizations. The main moment for them is to identify and understand the needs of the customer, to understand how to attract the customer and the most important – how to make from them a long-term customer. Nowadays the companies use a wide range of marketing strategies with the purpose to attract new customers as well as to retain the existing ones and to create a long-lasting relationship.

Research Results and Discussion

1. CRM Definition

The relationship between business industries and their customers is described by the concept of Customer Relationship Management (CRM). There are already lots of definitions of CRM. The very first definition of CRM brings us to the beginning of the eighties of the last century, where criticism about the marketing paradigm domination of "P4" (product, price, promotion and place) emerged (Kotler et al. 2001: 105-110). One of the first authors who emphasized the importance of relationships in the industrial marketing was Hakansson (1982: 19). One of the latest quiet precise definitions is given by G V R K Archarylulu, 2012 – CRM is defined as: "a process which rotates around customer's life cycle to heap cumulative data, examine customer's needs and preferences, developing strategies to meet their needs, communicating through proper network to reach customers and analyzing the result." In contrast to this complex definition Garret (2000: 3) made 12 years earlier very short and precise one: "CRM means different things to many people, but at its heart it means becoming a customer-focused organization."

2. CRM for Small and Medium-Sized business

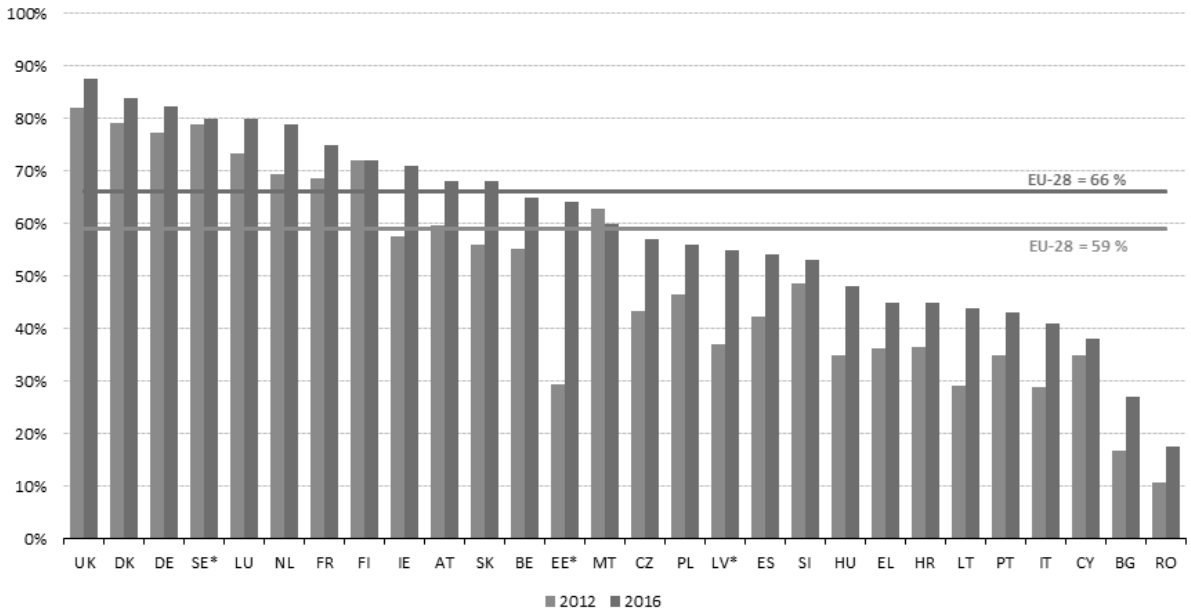
The CRM is very important especially for small and medium-sized enterprises. There are a numerous niche products, which are developed especially for those classes of companies (Brendel 2002: 29). In the changing economic environment especially small and medium-sized enterprises require specific business strategies and procedures, which should be provided by the CRM software. In additional it should be easy to install, easy to use, and for sure the software should be reliable and should meet all safety and privacy requirements. Usually small and medium-sized companies use different individual solutions of CRM for a customer database and a product database instead of a complete one, because of the cost savings. In any case nowadays every company makes efforts to implement CRM as affectively as they can, because there is an understanding of all benefits what the system can bring as well as prevent from various problems, related to the data privacy concerns. Generally, there are three key technology areas in CMR: Internet, customer Call Center, and data warehouse (Shacklett, M., 2001). Nowadays, in the world of digital technologies, could be said that Internet plays the most important role among the other CRM technology's' areas.

3. CRM and the Consumer Power

In these latter days technologies have empowered consumers in unprecedented way – and forced business enterprise to reconsider the customer service methodologies that have been in place since introducing the Call Centers some 60 years ago[1]. As technology is continuing its development, the consumer power is going to become bigger in the future. The rules of customer engagement in the business process are changing quickly, and the big challenge for small and medium-size companies is to create service environment in which business interaction with the customer is more engaging, more relevant, personalized, as well as more targeted than those delivered by competitors. Already nowadays, looking into the statistics could be seen that self-service and online communities are gaining strength. Looking into Figure 1 and comparing orders made online during year 2012 and year 2016 by Internet users in European Union, could be seen that the share of e-shoppers among Internet users is growing. Consumers appreciate the convenience of being able to shop

[1] The first call center agents were housewives in the 1950s. These ladies worked from home, dialing friends and neighbors in an attempt to sell baked goods to bring extra money into the household. https://www.tcnp3.com/home/call-center-solutions/a-brief-history-of-call-center-agents/

anytime anywhere, simultaneously having an access to a broader range of products, comparing prices, and sharing their opinion on goods with other consumers.



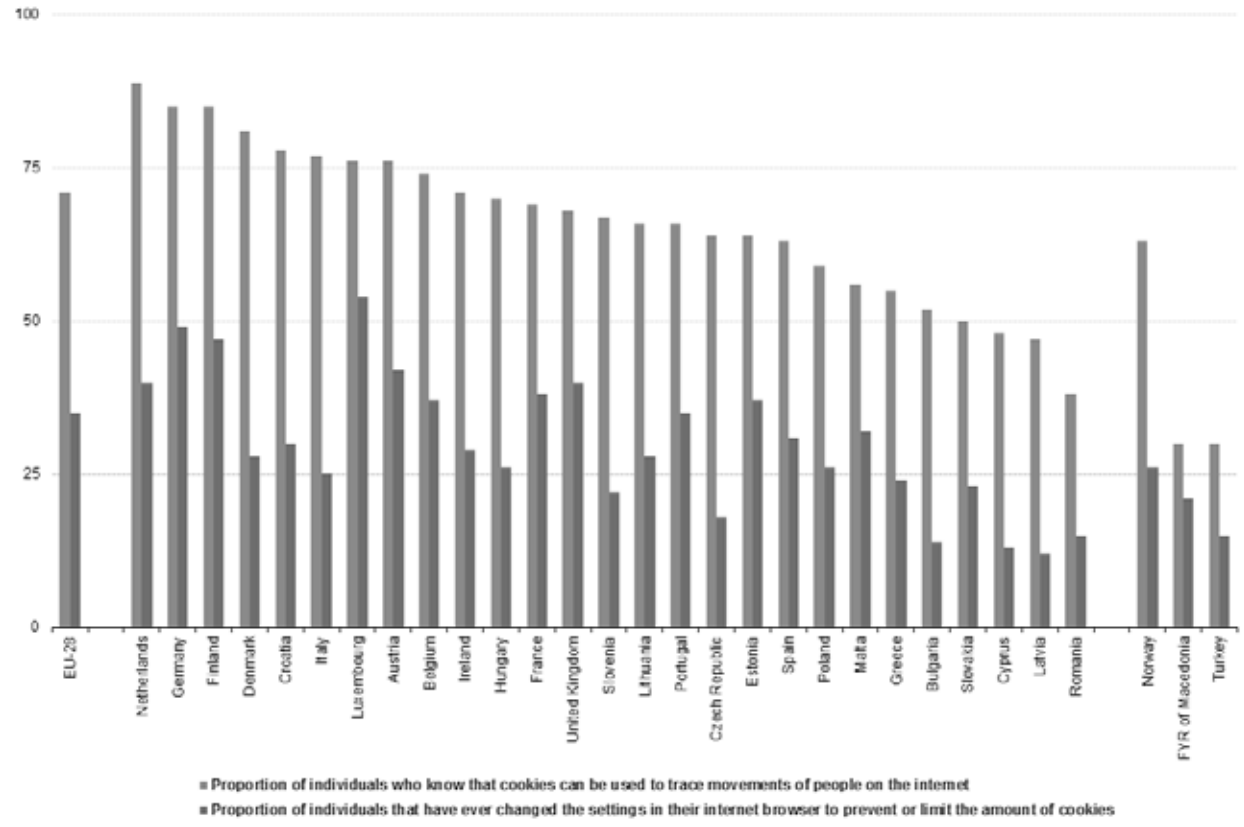
Source: Eurostat - http://ec.europa.eu/eurostat/statistics-explained/index.php/E-commerce_statistics_for_individuals;

Fig. 1. **Internet users who bought or ordered goods or services for private use over the internet in the previous 12 months, 2012 and 2016 (% of internet users)**

In our digital technology world the main goal of medium and small-size business should be to make the shopping for customers as easier as possible, on the same time more convenient than offer other competitors. And the CRM concept in the company should be oriented on that, taking into account the new realities and opportunities of the world business. That mean that companies should be able to collect, analyze, and present data efficiently from various systems, channels, and sources in a meaningful way. That will help to engage customers and provide them rich and satisfying experiences during the product or service purchasing. The boundaries of personalization in e-commerce have been expanded and have been assumed to have a great potential to influence consumer attitude and behavior, in the sense that personalization may help consumers to communicate with a company on a multidimensional level (Ansari & Mela, 2003). Personalization has proven to be an important element of the online store environment. It involves a process of gathering consumer information during the online interaction with the consumer, which is then used to deliver appropriate content and services, customized to the consumer's needs (Murthi & Sarkar, 2003; Smith, 2006). The self-service channels improvement is the realm of customer engagement optimization solution, which can use all customer systems and application to provide a complete customer engagement. Using the CRM with the purpose to rich customer engagement optimization will help any medium and small-size business to enrich customer interaction, improve business processes, and optimize the workforce. But should be taken into consideration, that personalization effects may vary depending on consumers' psychological and/or behavioral characteristics and experiences (Rose, Hair, & Clark, 2011).

4. CRM and Privacy issues

Nowadays the rise of cybercrime and non-compliance continue to make risk assessment of online data privacy and mitigation critical. There are expectations of a steady increase of regulatory requirements, especially those pertaining to the use of personally identifiable information. This can pose a dilemma for CRM initiatives: there increases the necessity for business to deliver a personal data, on the same side the regulatory requirements to protect consumer privacy and security become stricter. Consumers' concerns regarding the exposure of personal information and invasion of their privacy have been among the most important obstacles to marketing with information systems in technology-based environments (Park, 2011). Akhter (2015) pointed out that privacy concern is a core determinant of self-efficacy and Internet involvement. Such concern may stem from a lack of trust in e-commerce as well as ignorance about how e-commerce utilizes their information (Wu, Huang, Yen, & Popova, 2012). Thus, because mechanisms for personalization fundamentally rely on tracking website users' behavior history, privacy concern is likely to be a major obstacle to consumers' appreciation of personalization in e-commerce (Stead & Gilbert, 2001). According to the Eurostat analysis around 25% of Internet users reported that they had changed their Internet browser settings to prevent or limit cookies use (Figure 2). In the most developed countries like Netherlands, Germany, and Finland the awareness that cookies could be used to trace their online activities is very high, and people realizing that trying to prevent and turn those off. In other countries the awareness of that fact will for sure grow during the next years as well, and it will create some difficulties for companies to collect and analyze potential customers' behavior as well as personal data.



Source: Eurostat - http://ec.europa.eu/eurostat/statistics-explained/index.php/E-commerce_statistics_for_individuals;

Fig. 2**. Use of cookies and browser settings, 2016 (% of individuals who used internet within the last year)**

As a consequence, consumers' fears about privacy may also affect the validity and completeness of the information they choose to provide, which could ultimately lead to inaccurate targeting, wasted effort, and frustrated consumers (Awad

& Krishnan, 2006). According to the latest survey made by KPMG[2] in year 2016 more than half, or 55% of consumers surveyed globally said that they had decided against buying something online due to privacy concerns, as well as less than 10% of consumers felt they had control over the way organizations handle and use their personal data today. Regarding the data sharing, over half of survey respondents said they were willing to share their gender, education or ethnicity online, on the same time a considerably lower proportion were happy to share more sensitive information, such as location (only 16%), address (only 14%) or medical records (only 13%) (KPMG 2016:10).

According to the KPMG survey made, there are already signals that people are thinking about staying out of the e-commerce, what could result in the decrease of the available analytical data of potential consumers for enterprises and as a consequence make a negative effect on CRM initiatives.

5. Leverage between the Data Collection from a Customers and a Privacy Concerns

Girard, D. (2000) once pointed out that while Internet provides direct communications opportunities for companies, it also makes privacy a main concern in the customer's mind. Everyone knows in the business industry that negative brand experiences can quickly negate years of brand-gained positive reputation, and the most important – the trust a consumer places in a brand. The same is with the private data. Nowadays with a market digitalization, in which almost on every used web-page by a customer he/she has his/her own online profile with the personal information stored, even a single data breach can substantially damage consumer trust. It is not secret that consumer product companies have been accumulating all available information about their consumers with the intent to have a most efficient data base about their customers. Here the potential problem is – the more data company collects, and the more sensitive that data is, the greater possibility of hackers attack is, as well as increases the risk associated with data breaches.

Here the dilemma situation for business enterprises appears. On the one hand there are a lot of regulatory requirements regarding personal data collection, usage, and storage, which makes the CRM more problematic as well as more expensive year from year. On the other hand, as Mckenzie, R (2002) stated that Internet-powered customers request personalized services based on obtaining large amount of information. If they can't get satisfied services, they won't keep loyalty. Could be concluded that nowadays consumers already used to have a good service, in most cases they are waiting that web-page suggests to them a product according to their wishes. In such environment, if any business enterprises, especially medium or small-sizes business will keep themselves out of the e-commerce and data collection process, they simply will not survive. And as ones was stated by N. Rothschild "Who owns the information, he owns the world" is even a bigger truth nowadays in our world.

Conclusions, proposals, recommendations

From the information presented before in the paper could be concluded that nowadays business enterprises cannot develop their products without knowledge about their customer, therefore the CRM solution should have a very good possibility of the data collection. On the same side the private data collection process should be transparent and secured; otherwise the company can lose their consumers' trust and the possibility of a long-term cooperation. Taking that into account, could be concluded that as an important part of building a brand for strong data privacy and security practices business enterprises should develop a vision and strategy for using and protecting consumer data with an acute awareness of how consumers might interpret the company's activities (Deloitte 2016).

[2] KPMG - is a professional service company and one of the Big Four auditors, along with Deloitte, Ernst & Young (EY) and PricewaterhouseCoopers (PwC).

With the purpose to leverage between the data collection from a consumers and privacy concerns leaders should consider under the CRM an understanding what consumers appreciate and what they might object to in the use of their personal data. Could be recommended that leaders ask the following question:

- How the consumer experience could be improved, from awareness, considering an initial product trial and repeat purchase?
- What kind of data is available already or what data should be collected with the purpose to improve the consumer experience?
- In what situation there should be asked the permission of the data collection or usage rather than the obligation of the collecting/using the consumer data?
- What is the process of collection and storage of "excess" consumer's data that company does not use or does not need? What should be done with this data, if there is a possibility of breaches and it could be harmful to consumers?
- Which of the attempts to improve the consumer experience could be considered as an inappropriate rather than helpful? and
- How transparent, timely, coordinated, and comprehensive the company is in a case there is come data attack?

The next moment is that privacy policies in the company should be developed as if they are a marketing tool rather than only a legal disclosure. With the purpose to increase consumers' trust there could be clearly stated how consumer's personal data will be used and could be given more control to consumer over the use of their data. In that case the privacy policy instead of having a difficult legal language should be easy-understandable for every consumer with clearly stated points. As an example, could be mentioned: 1. what kind of personal data does the company collect; 2. how the company uses the data; 3. how the company protects the data; 4. how consumers can prevent some data collection; 5. how do consumers benefits from the collection and analysis of their data.

One more very important moment is that there should be worked out internally in the company very strict procedures of the data collection, storage, and usage.

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VULNERABLE FAMILIES: CASE OF LATVIA

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Abstract. Background: Considering the increasing variety and complexity of family types, it is necessary to focus on the protection of vulnerable families or those families that are "at risk". Although it is argued that there does not exist a specific family type which leads to vulnerability, most experts agree that there are some types which have a higher possibility of being vulnerable – the most noticeable of them are families with single parents and families with many children. Discussions are also related to the specific vulnerability of migrant families and families who include members in need, especially disabled children. (Mynarska et al., 2016, Mynarska et al., 2015) The aim of the study is to analyse the relationship between these factors in the context of Latvia. The research shows how different socio-economic factors of the woman influence the poverty risk of her family.

Data and methods: 10 877 women whose first child was born in 2006 and their families are included in the study cohort and observed in ten years' period. The preliminary results show a significant correlation between the vulnerability risk and the level of educational attainment of the woman. The vulnerability risk is similar in families with one to three children, and it increases starting from the fourth child. In single mother's families, state benefits are important.

In Latvia, it is not possible to see a link between vulnerability risk and a past of immigration. In families with disabled children, the level of income does not differ from other families; however, they have larger expenses and other risks of vulnerability. A continuity of vulnerability from one generation to the next in relation to the level of educational attainment can be seen, but the level of educational attainment of the woman is more related to the level of educational attainment of her spouse than the level of educational attainment of her parents.

The analysis is based on data from the Population and Housing Census 2011, the Office of Citizenship and Migration Affairs, the Ministry of Education and the State Revenue Service.

Key words: *children, family, vulnerability, parents.*

JEL code: O15 (Human Resources • Human Development • Income Distribution • Migration)

Introduction

Similar researches have already been carried out in different countries, e.g. the Journal of European Social Policy has published an article (2007) "The incomes of families with children: a cross-national comparison". (Sigle-Rushton et al, 2007). Using data on seven countries, the authors estimated trajectories in family incomes for families with and without children following several stylized life-courses. Focusing mainly on women with a medium level of education, they found that in general the gaps in family income are smallest in the Nordic countries, intermediate in the Anglo-American countries, and largest in the continental European countries. Authors set out to learn about the size of differences in gross and disposable family income between families with children and without children and the extent of income trajectory differences across countries. It was possible to see clear clustering of countries by social welfare regime type, except for highly educated women. In general, gaps in both gross and disposable family income between families with and without children are smallest in social democratic countries, intermediate in liberal countries, and largest in conservative countries.

EU project "Families and Societies" took place in the period between February 2013 and January 2017 (Mynarska et al, 2016). During the project, a research "Vulnerability in Times of Family Diversity - A Practitioners' View" was realized with the participation of several countries - Austria, Belgium, Poland, Spain, and Sweden. The experts concluded that

economic hardship is a central aspect of vulnerability. They also emphasised the importance of social context (e.g. social exclusion, stigmatization or lack of social support). Vulnerability was also perceived in more general terms as a lack of balance and stability in the lives of families. While some experts argued that no family configuration inevitably leads to vulnerability, there was a consensus that some types are more "at risk". Single parents and families with many children were perceived as the most vulnerable. The special vulnerability of orphan and adoptive/foster families, migrant families and families with members in need, especially those with disabled children, was also discussed. Families simultaneously belonging to more than one category (e.g. a single parent with a migrant background with a disabled child) were perceived as being particularly vulnerable. (Mynarska et al, 2016)

The aim of the research VULNERABLE FAMILIES: CASE OF LATVIA is to compare the results of international research with the situation in Latvia and to identify factors determining the risk of family vulnerability in Latvia. The research inspects 10 877 women who had their first children in 2006 and who had their place of residence registered in Latvia on 01.01.2017. All the results shown in the tables and figures refer to this cohort.

22 871 children were born in Latvia in 2006 (CSB, 2017). 52% of them were the first children to their mothers; 56% of children were born within marriage; 49% of the first children were born within marriage. The research does not include 1026 mothers who have emigrated and 57 mothers who have died.

On 01.01.2017., there were 21 350 children living in the families included in the research, and 19 544 of the children had their registered residence in Latvia. This includes the children born in 2006 as well as their younger siblings. The families also include 84 children who are older than the child born in 2006. This situation has arisen because several women have adopted the children of their spouses from previous relationships.

Distribution of families by number of children in 01.01.2017 is the following - 39.2 % of families have one child, 45.9 % of families have two children, 12.1 % of families have three children, 2.7 % of families have four or more children.

The following data was used in the study:

1. From the databases of the Office of Citizenship and Migration Affairs (2006 and 2017):
   1.1. the age of the woman at the time of birth of the first child;
   1.2. current place of residence of the woman (whether she lives in Latvia in 01.01.2017);
   1.3. the number of children under 18;
   1.4. the legal status of the family and the spouse, his country of origin;
   1.5. the parents of the woman, their country of origin.
2. From the Population Census 2011 data - the level of educational attainment of the woman, her spouse (married spouse or cohabitant) and her parents.
3. From the Ministry of Education and Science data, 2016/2017 educational year - whether any of the children are involved in a special educational program.
4. From the State Social Insurance Agency data, 2016 - state benefits for disabled child care.
5. State Revenue Service data:
   5.1. Report on the mandatory social insurance contributions from employee work income, on personal income tax and the State duty of business risk in the reference month, 2016;
   5.2. Microenterprise tax declaration, 2016;
   5.3. Report on the state social security contributions of the self-employed person or domestic employee working for a foreign employer, or foreign employee working for a foreign employer, 2016;
   5.4. Income gained abroad by natural persons (residents) – D2 form, 2016;
   5.5. Income from business activities if the taxpayer keeps accounting records in double-entry accounting – D3 form, 2016;

5.6. Business activity income statement for taxpayer paying fixed income tax - D5 form, 2016;

5.7. Announcement on amount paid for natural persons, 2016.

6. The State Social Insurance Agency benefits (VSAA, 2017):

6.1. until the child is 1.5 years old 171 euros per month;

6.2. from 1.5 to 2 years old 42.69 euros per month;

6.3. disabled child care benefit – 213.43 euros per month;

6.4. premium for the disabled child care benefit – 106.72 euros per month;

7. Family state benefit from the age of 1 year to 15 years:

7.1. for the first child in family – 11.38 euros per month;

7.2. for the second child in family – 22.76 euros per month;

7.3. for the third child in family – 34.14 euros per month;

7.4. for the fourth and every next child – 50.07 euros per month.

8. The Maintenance Guarantee Fund benefits (UGF, 2017):

8.1. 0-6 years - 95 euros;

8.2. 7-17 years – 114 euros.

The calculations were carried out in the program IBM SPSS Statistics.

Research Results and Discussion

The income of the family is calculated by adding the average income of the woman and her spouse as well as the state guaranteed benefits set in legislation. The spouse of the woman is assumed to be the married spouse of the woman on 01.01.2017 or, if the marriage is not registered, the cohabitant stated in the Population Census on 01.03.2011. The state guaranteed benefits include State Social Insurance Agency (SSIA) benefits, state benefits for disabled child care and family benefits for children (1 - 15 years old).

It is more complicated to determine the amount of income provided by the father of the child if he is not living in the family. Often the financial help is not documented and is provided under agreement. Thus, if the spouse does not live at the residence of the woman, the benefit from the Maintenance Guarantee Fund is added. (UGF, 2017)

This research examines relative poverty - the risk to find themselves below the poverty line in comparison to other families examined in the study (Meiere, 2010). In accordance to internationally agreed methodology, the relative poverty threshold is 60% of the median equivalised disposable income of the families included in the research after social transfers, calculated in accordance to the equivalent number of consumers in the household. It is calculated with the coefficient 1 for the first adult, coefficient 0.5 for the second adult and coefficient 0.3 for each child.

To carry out the research, the following variables were set:

1. the age of the woman at the time of birth of the first child;
2. level of educational attainment in the Population Census - basic, secondary or higher;
3. level of educational attainment of the family - the average level of educational attainment, considering the educational attainment levels of the father, mother and spouse of the woman;
4. past immigration - whether any of the family members are born outside Latvia;
5. singleness - was not legally married on 01.01.2017 and has not provided a cohabiting partner in the Population Census;
6. disabled children - the family receives state benefits for disabled child care or any of the children is enrolled in a special educational program;
7. the number of children under 18 on 01.01.2017;

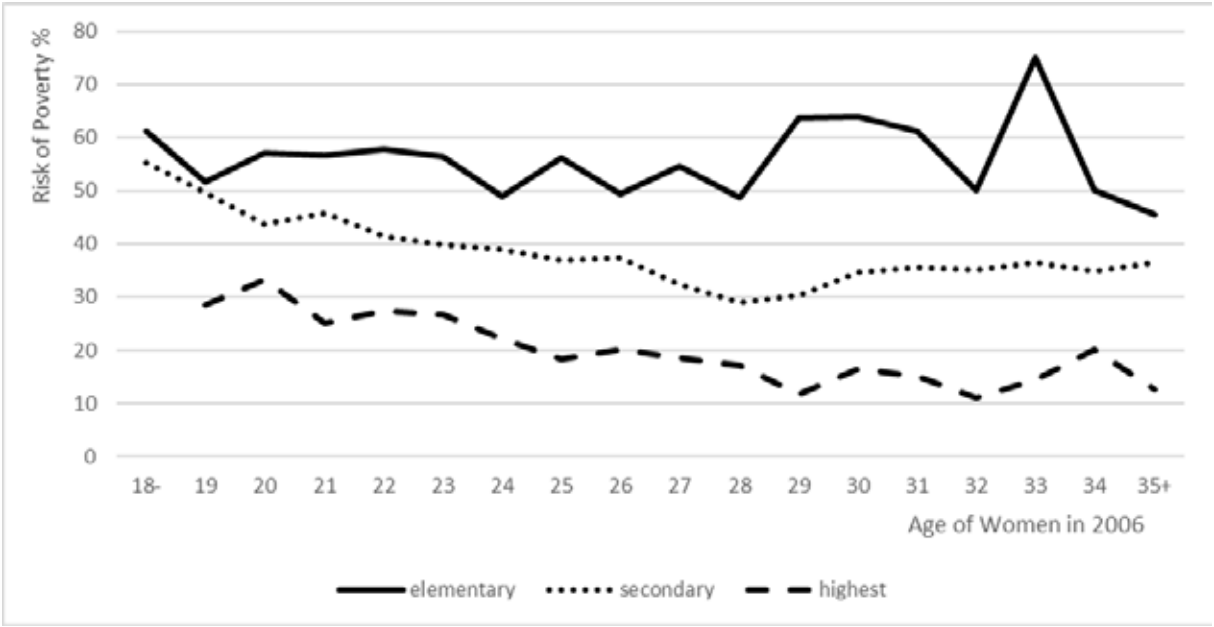
8. average income per person.

The families examined in the research have been divided into two categories depending on whether the average income per person is below or over the poverty threshold.

1. Correlation between the risk of poverty, educational attainment of woman and age of birth of first child

10 877 women who had their first children in 2006 and who had their place of residence registered in Latvia on 01.01.2017 have been observed. Level of educational attainment of woman was fixed in Population Census 2011 – five years after the birth of her first child.

Calculations show that in the group of families where the woman has elementary education, in 01.01.2017 all families have an elevated risk of poverty. In the group of families where the woman has a secondary or higher education, the families where the first child is born to the woman in early age are at higher risk of poverty (see Figure 1).



Source: Author's calculations based on Office of Citizenship and Migration databases, Population Census 2011 data, The State Social Insurance Agency 2016 data and State Revenue Service 2016 data

Figure 1 **Risk of poverty, educational attainment of woman and age of birth of first child (n = 10 877)**

2. Reproduction of vulnerability

In the international research "Vulnerability in Times of Family Diversity - A Practitioners' View" (Mynarska et al., 2016), it was possible to determine a "reproduction of vulnerability" - a correlation between the level of educational attainment of the woman, her spouse and her parents.

Level of educational attainment of woman in Latvia was fixed in Population Census 2011. Calculations show that the continuity of vulnerability is also seen in Latvia in relation to the lack of education carried over from one generation to the next; however, the level of educational attainment of the woman is more closely related to the level of educational attainment of her spouse than to her parents (see Table 1).

Table 1

Correlation between the level of educational attainment of woman, her spouse and parents (n = 10 877)

	Women	Spouse	Mother	Father
Women	1	0.453**	0.339**	0.280**
Spouse	0.453**	1	0.230**	0.195**
Mother	0.339**	0.230**	1	0.425**
Father	0.280**	0.195**	0.425**	1

**. Correlation is significant at the 0.01 level (2-tailed).

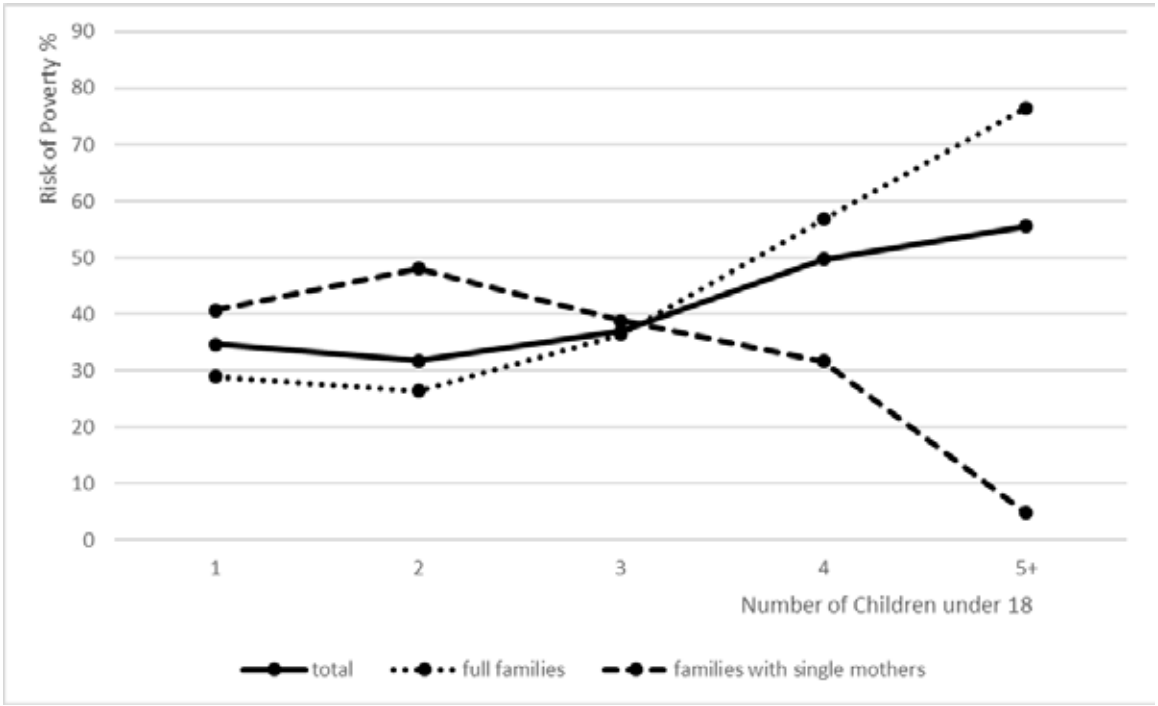
Source: Author's calculations based on Office of Citizenship and Migration databases, Population Census 2011 data, The State Social Insurance Agency 2016 data and State Revenue Service 2016 data

It means that in the most cases the 'reproduction of vulnerability' is not realised - the new family is able to reach a different level of income than their parents.

3. Correlation between the number of children, singleness of mother and risk of poverty

10 877 women who had their first children in 2006 and who had their place of residence registered in Latvia on 01.01.2017 have been observed. Number of children, singleness of mother and risk of poverty of woman was fixed in 2016 – ten years after the birth of her first child.

Calculations show that when examining the risk of poverty in relation to the number of children in the family, it can be determined that it is similar in families with one, two or three children, but the risk of poverty increases in families with four or more children. If another variable - the singleness of mother - is taken into consideration, another situation arises. In families with one or two children, the risk of poverty is higher in families with single mothers; in families with four or more children, the risk of poverty is higher in full families (see Figure 2).



Source: Author's calculations based on Office of Citizenship and Migration databases, Population Census 2011 data, The State Social Insurance Agency 2016 data, State Revenue Service 2016 data

Figure 2 **Number of children, singleness of mother and risk of poverty (n = 10 877)**

This situation arises because full families have a greater income dispersion. They include families with very high income and very low income. In some of the families, the income of the spouse is lower than MGF benefits, but the father of the child lives in the family, so the family does not receive state benefits. It means that many families with single mother raising several children are slightly over the poverty line threshold, while the income of full families are dispersed in wider interval, and a part of the families are below the threshold.

4. Immigration past, disabled child and poverty risk

In comparison to the international research "Vulnerability in Times of Family Diversity - A Practitioners' View" (Mynarska et al, 2016), in the case of Latvia it is not possible to see a relationship between the poverty risk and the immigration past of family (36.2% if immigrated, 33.8% if not). For most of the families included in this group, one or both parents of the woman are born in Russia, Ukraine, or Belarus. These families are usually well-integrated in the society and labour market in Latvia.

Calculations show that the level of income in families with disabled children is on similar level to other families (39.5% if the family has a disabled child, 34.2% if it does not). State benefits for disabled child care are sufficiently high in comparison to the income of the families. However, these families have larger expenses and are prone to other risks, e.g. the parents are not able to work full-time or the families are at risk of social exclusion.

Conclusions

1. Some of the factors which are determined as influencing the risk of poverty in international research are confirmed also in the case of Latvia, while other factors do not play a significant role in Latvia.
2. In the group of families where the woman has elementary education, all families have an elevated risk of poverty.
3. In the group of families where the woman has secondary or higher education, the families where the first child is born to the woman in early age are at higher risk of poverty.
4. In most cases, the 'reproduction of vulnerability' is not realized - the new family is able to reach a different level of income than their parents.
5. Risk of poverty is similar in families with one, two or three children, but increases in families with four or more children.
6. In families with one or two children, the risk of poverty is higher in families with single mothers, but in families with four or more children, the risk of poverty is higher in full families.
7. In the case of Latvia, it is not possible to see a relationship between the poverty risk and the immigration past of family.
8. The level of income in families with disabled children is in similar level to other families, however, these families have larger expenses and are prone to other risks.

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SIMILARITIES OF SOCIAL NETWORKS FUNCTIONS AND CUSTOMER USAGE APPROACHES IN ELECTRONIC MARKETS

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Abstract. This research paper provided an introduction to the theoretical fundaments of e-business and electronic markets. Within this research the environment of electronic markets and business possibilities are explained due to the usage of standard business models. This theoretical research is the fundament for the evaluation of functional integration of interaction functions in B2C oriented online social networks. Due to the functional complexity of online social networks standardized computer-mediated interaction pattern are used to compare the evaluated networks.

The analysis of social networks includes the functional approach of Facebook, Instagram, LinkedIn, Twitter and Xing for the field of awareness creation, welcome handling and guidance through the network, the support of group communication and user protection. The results display similarities and differences in the social networks based on their functional offers to end users. Within the results the freemium approach can be identified as differentiation between general end user oriented social networks and business related social networks. In addition the similarities between the networks can be displayed clearly in the results due to the comparable usage of pattern.

Key words: *Social Networks, CMI Pattern, Electronic Markets, E-Business*

JEL code: D39, D47, L1

Introduction

This research paper is published as part of a general research project regarding the evaluation of the influence of sociodemographic variable on the usage of Internet services. The usage is researched to provide a more quality ensured usage of social media communication to prospected and active customers during business transaction within electronic markets.

The business approaches in the e-business market itself have similarities on their target markets and clients, services and especially in their functionalities which the offer onto their clients. The evaluation of social network functionalities is necessary to research due to the ability that the usage of those functions increase the time clients spends within the network. This research paper provides answers to the following research questions:

R1: Which models can be used to explain electronic markets?

R2: Which services in electronic markets have the highest reach to Internet users?

R3: Which functions exists in most of the social network services in electronic markets?

R4: Who differentiate social networks by the functions they offer to their users?

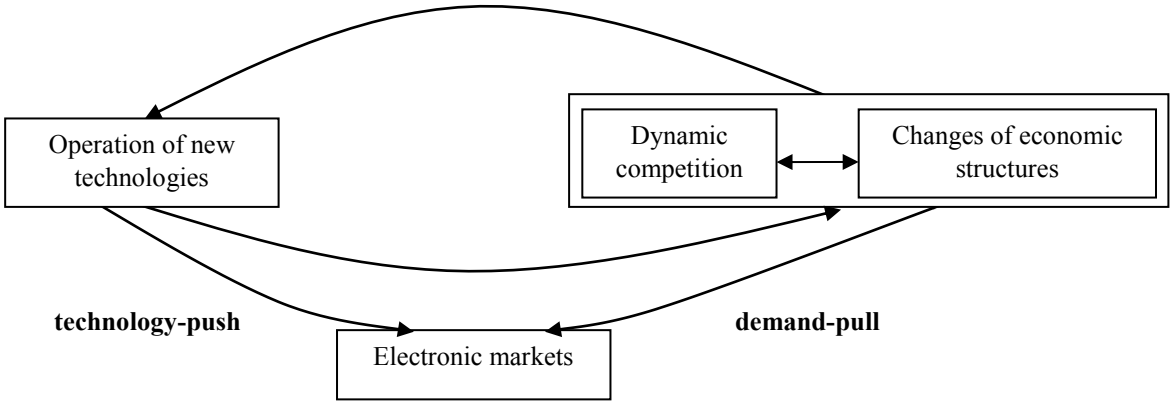
The research was transacted in the first segment as a literature analysis of actual and standard publications of the field of electronic markets and e-business to provide an overview about the research area of electronic and e-business markets. In the second segment the market differentiation within the market leaders from the field of social networks were evaluated with a focus on technologically functionalities. An overview of the most often used functionality for client

interaction is summarized and includes on overview about client similarities. The outcome of the research is used for future research within the field of quality assured business transactions support for e-business models.

Research results and discussion

1. Electronic Markets and E-Business Models

For end-customers electronic markets are mostly part of the global media (consumer) market. The media market divided itself into individual sub-segments. Those includes (Wirtz, 2011) markets for non-electronic media, the Internet market, with apps, mobile markets and the www market and traditional media markets including music, films, TV and radio. Businesses electronic markets are a huger as only media markets, as the can used them for distribution of products and services. E-business itself started earlier as the current market transaction on the www layer from the Internet, where the first transactions proceeded in 1994. The roots of e-business dates back to the first usage of Electronic Data Interchange (EDI) and Electronic Funds Transfer (EFT), which were used in the between businesses for exchange of orders or for the transfer of payments. Even the support of business via electronic solutions, like the usage of credit cards or cash machines in the past, is part of an electronic market transaction and might count as e-business (Core, 2017). For new services the delivery via drones or same day delivery, electronic markets allow business, due to the direct connection to the customer to act fast and directly. Due to the global availability of electronic offers new services can be implementing fast and direct onto new offers from a business or service.



Source: author's construction based on (von Aadorf und Tobel, 1994, p. 80)

Fig. 1. **Context of the origin of electronic markets**

Regarding the term of e-commerce several definitions exist. (Choi et al., 1997) defines electronic commerce as "a new market offering a new type of commodity, such as digital products through digital processes", which displays the possibilities of new products and services which did not exists without electronic markets. (Picot et al., 2001) defines electronic comers as any economic activity on the basis of electronic connections. During the last years, the global e-commerce market has become a billion dollar market which influences nearly all kind of businesses.

Table 1

E-Commerce B-2-C revenue worldwide in billion US-$

	North America	Asian/Pacific	W. Europe	E. Europe	Latin America	Middle East/Africa
2013	431,0	383,9	308,9	49,5	48,1	27,0
2017	660,4	1.052,9	432,6	73,1	74,6	51,4

Source: author's construction based on (Core, 2017)

The business interactions in the field of e-commerce and electronic markets can focus on different groups (Pfeiffer & Schwickert, 2000). They can differentiate between the provider and the client of the offer and the business itself. It must be distinguished which customer relation is examined and which kinds of businesses are involved.

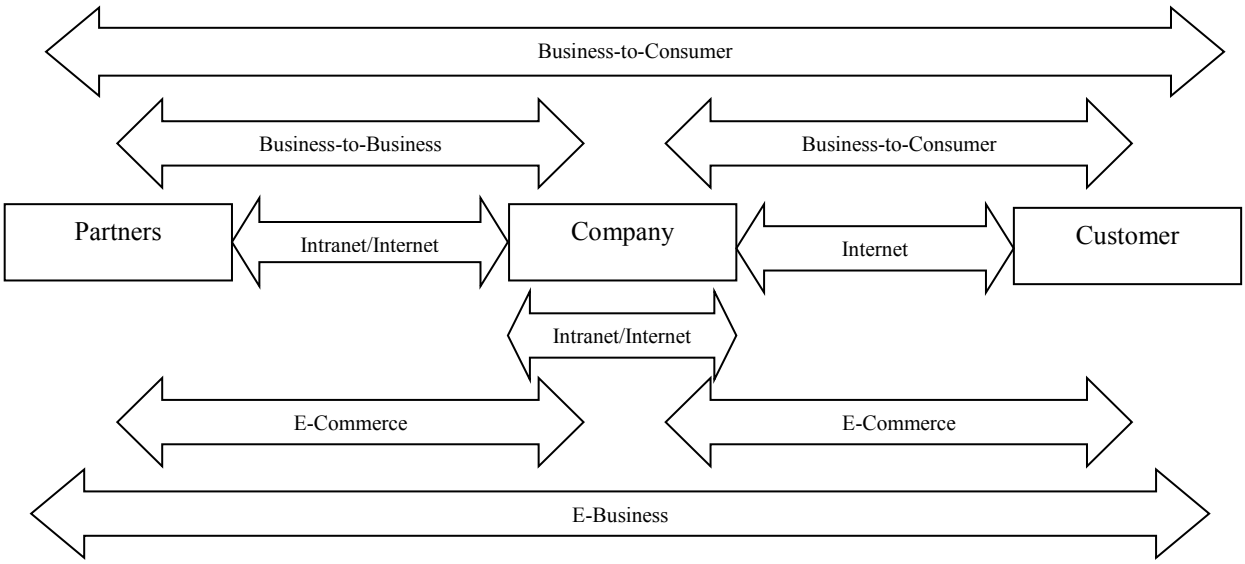
Table 2

Examples of E-Business Cases based on Providers and Clients

		Client		
		Consumer	**Business**	**Administration**
Service provider	**Consumer**	*Consumer-to-Consumer* e.g. sales via classifieds or auctions	*Consumer-to-Business* e.g. product reviewing page or of work via crowdworking	*Consumer-to-Administration* e.g. supporting the administration by providing information about waste
	Business	*Business-to-Consumer* e.g. Ordering of a customer on a marketplace	*Business-to-Business* e.g. ordering of goods and merchandise	*Business-to-Administration* e.g. tax declaration
	Administration	*Administration-to-Consumer* e.g. providing of online voting or tax declaration	*Administration-to-Business* e.g. request for quotations	*Administration-to-Administration* e.g. exchange between administrations (in and outside of a country)

Source: author's construction based on (Hermann & Sauter, 1999)

The different cases of e-business are part of the interaction within electronic markets. During an e-business transaction, e. g. in a supply chain from the production to the end customer, different kinds of relationships interacts. Those might include a combination of Business-to-Business and Business-to-Consumer interaction. The interaction depends on the business transaction which is processed (Lechner et. al, 1998).



Source: author's construction based on (PricewaterhouseCoopers, 1999)

Fig. 2. **E-Commerce and E-Business-Modelling**

It is necessary to understand in which context stakeholders interacts in the electronic markets and how those interactions can be analysed and modelled. An analysis of models for the different parts and interactions in electronic markets was aggregated by (Schwickert, 2004). For the field of electronic markets, service offers and distributions the e-business models which are developed by Bernd W. Wirtz were considered as the most developed. (Wirtz, 1999) provides the analysing of the transfer of the media content business from traditional to online media markets and provides the idea of one of the first Internet media value chain. Wirtz later developed the 4C-Net-Business-Model where the business in the Internet is defined by four C's. Those four C's includes the context of an electronic business, the distributed content,

the way of commerce and the connection with customers (Wirtz, 2011). The Internet business itself is by is existence influence by competitors, the complexity of the market, customers and virtualisation requirements.

Besides the modelling of business cases and business itself the external requirements on the participants of an electronic market the market itself can be differentiate. It is important if a closed or open electronic market is targeted. E-commerce relationships may be established on different markets and it might be possible that a closed electronic market exist in an open electronic market. As restriction for a closed market a premium approach can be applied. The differences between those markets might be fluid by the use of a Freemium approach (Gupta et. al, 2013), which allows the closing of different parts of an electronic market for paying users.

Table 3

Types of closed and open electronic markets

Closed electronic markets	**Open electronic markets**
i.e. Business-to-Business	i.e. Business-to-Business, Business-to-Consumer
Closed, mostly sector specific club or trading	Open market, global standard
Dedicated amount of clients	Unlimited amount of clients
Closed, (company) internal markets	Open, unprotected markets
Known and already established partners	Established and new partners
Secureness through the network	Secureness through the network and authentication
The club is the market	The network is the market

Source: author's construction based on (Steyer, 1998)

2. Interaction Pattern in the Internet

In the electronic markets which are based on the Internet technology social networks have become the offers which reach the most Internet users worldwide (Linke, 2011). Due to their business approach, they are focussing on the connection of users, partly based on their interests. The technological capability of the Internet allows people to use social networks for dedicated interaction purposes. At present, communities and social networks have become part of marketing measures implemented to reach customers. (Gillin, 2009) recommends different combinations of networks and services for online business and for business communication and business transactions with customers. In (Gillin, 2009) also Podcast and private Communities were mentioned as important for customer to customer business in the Internet. Those might have change during the time due to the raise of social networks and their usage for social media. In the current time business interaction with customers and prospects should be on social networks in electronic markets to reach the highest amount of possible customers.

Table 4

Social media and business situations

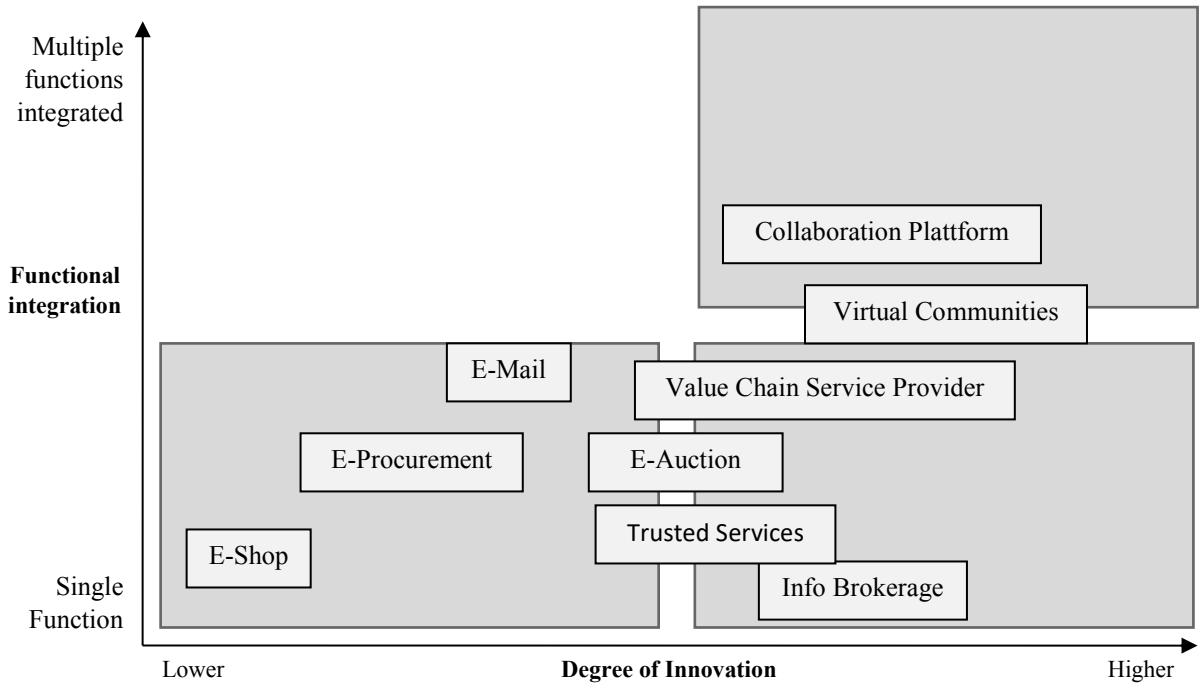
	Blog		Social Network		Customer Review Page		Virtual World	
	2009	2017	2009	2017	2009	2017	2009	2017
Build customer community	+	+	+	+	+	?	+	+
Crisis management	+	+	+	+	+	?	+	+
Generate traffic	+	+	-	+	+	+	-	-
Humanise the company	+	?	-	+	-	-	+	+
Market research	+	?	+	?	+	?	+	+
Media relations	+	+	-	+	+	?	+	+
Generate new product ideas	+	?	+	+	-	-	+	+
Product promotion	+	+	+	+	+	?	+	+
Product support	+	+	-	+	-	+		+
Sales leads	+	+	+	+	+	+	+	+
2009 by (Gillin, 2009) 2017 own expectations due the market research and current usage on the media market								

Source: author's extended construction based on (Gillin, 2009)

For the analysing of the functions from social networks it is useful to research the field of software and interface pattern and especially pattern for interaction support and group behaviour. Such pattern will help to understand which functions and technical services are offered to customers and which can be used for interaction with customers.

(Alexander, 1977) defined software pattern as: "Each pattern describes a problem which occurs over and over again in our environment, and then describes the core of the solution to that problem, in such a way that you can use this solution a million times over, without ever doing it the same way twice." In the definition for the description of software design pattern by (Gamma et al., 1995), which provided first a pattern language for software development, each pattern contains the elements pattern name, problem, solution and consequences. The approach might be extended by later developed software pattern by example code and UML diagrams for a faster implementation. In the research we are using pattern for social communication, group handling and social interaction. Pattern for social communication, group handling and social interaction focuses on the handling of user and their handling or artefacts. The activities from the user included past, current and planned activities, the interaction between the users can be only focuses on a single user, or on a loose or tight cooperation and the artefacts itself (Schümmer, 2005). For the artefact it is distinguished if the artefact is in focus of an activity, belongs to other artefacts with in the current focus or is different from the current artefacts from the user and his focus (Rodden, 1996).

For the analysis of social networks regarding the usage of interaction pattern, existing pattern from the field of groupware analyses will be used due the similarities of groupware and social networks. In general social networks might be included in the definition of groupware applications. (Bauknecht et al., 1995) clusters groupware application by common functionalities like communication systems, workflow management systems, shared information spaces or workgroup computing systems. When we compare those definition with the classification from (Timmer, 1998), it can be displayed that virtual communities (social networks) are nearly in the same field of innovation and function integration as collaboration platforms. (Lukosch & Schümmer, 2007) includes all communication and cooperation application which needs coordination within the application.



Source: author's construction based on (Timmers, 1998)

Fig. 3. **Classification of Internet business models**

The analysis contains two analyses. First the research of the social networks considering the available information about pattern from the pattern language "Pattern for Computer mediated interaction" (Lukosch & Schümmer, 2007), which extends the approach of "A Pattern language for Group Formation by enhanced awareness" (Schümmer, 2005). In the second step a comparison of the existing functions, which are available in the social networks, but not completely covered by the pattern, is realised. This analysis is accomplished to cover those functions, which also needs to be compared to understand the functional similarities in social networks more in detail. For those analysis designer pattern languages for interface design are used (Tidwell, 2010; Crumlish & Malone, 2015).

In the analysis regarding the pattern implementation the results displays the status X for integrated, 0 for not completely integrated, which means that the pattern is integrated rudimentary, F if a function is integrated but only complete usable via a premium account and – for not integrated. The following groups of pattern are research:

Table 5

Overview Groupware Pattern Groups

Group name	Description
User Welcome Pattern	A group of pattern which helps and support users to get into a groupware or social network and to start interaction with other users.
User Guidance Pattern	A group of pattern which supports users to find other users, to support the quality of the content and contributions within a network and to support the interaction with other users and the contribution into and for the network.
User Protection Pattern	A group of pattern which helps to protect the privacy and data of a user.
User Group Communication Pattern	A group of pattern which supports the supports the interaction within a group or within a network by providing functions for interaction.
User Awareness Pattern	A group of pattern which helps to create awareness for direct or indirect interaction between users.
External Social Network Pattern	A group of pattern which provides functions for external web pages
Other Social Network Pattern	A group of pattern which descript functions for users in social networks
Other Social Network Functions	Group of functions in social networks which are not covered by evaluated pattern

Source: author's construction

For the research and transfer on existing networks several restrictions apply: Only social networks which are available via browser were analysed. That includes Facebook, LinkedIn, Twitter and Instagram. Due to the later usage of the results for the German online market, the German market leader in the field of business networks Xing is included in the research. In the analysis pattern which focuses on the support of cooperative work or project group building are not included as also pure page design pattern, architecture pattern, server pattern, security pattern or workflow pattern. The implementation of standard pattern for current online social network like registration, login, or Activity Streaming (Crumlish & Malone, 2015) and the storing of user information like descript in Gaze over the shoulder (Schümmer, 2005) and Elephant's Brain (Schümmer, 2005) were not considered. The analysis of cooperative work or project group building pattern might be usable for later analyses of niche social networks like Meetup or Research Gate. The researched functions are those functions which were online in the networks in May 2017.

Table 6

User Welcome Pattern

	LinkedIn	Xing	Facebook	Twitter	Instagram
Welcome area (Lukosch & Schümmer, 2007)	0	X	0	0	-
Virtual Me (Lukosch & Schümmer, 2007)	F	F	X	X	X
User Gallery (Lukosch & Schümmer, 2007)	F	F	0[1]	X	X
Buddy List (Lukosch & Schümmer, 2007)	X	X	X	X	X

X = integrated; 0 = not completely integrated; F = Freemium, - = not integrated;
[1]: With the 2016 Social Graph function Facebook had a complete open integration.

Source: author's construction

The function of a welcome area, where new users from the area or new friends of existing contacts are directly introduced, is not in each network directly and on the landing page of a user integrated. In the most cases the introduction of new users is implemented in the search for new contacts of is integrated, mostly with a low prioritisation, into the timeline of a user. The Virtual Me of a user is implemented in all networks, even when the both business networks LinkedIn and Xing only provide all functions to premium customers. A buddy list is also in all networks available, as also the user gallery. For the User Gallery the same restrictions as for the Virtual Me applied. The full usage is only available for premium customers in the business networks LinkedIn and Xing.

Table 7

User Guidance Pattern

	LinkedIn	Xing	Facebook	Twitter	Instagram
Quality Inspection (Lukosch & Schümmer, 2007)	X	X	X	0[1]	X
Birds of a Feather (Lukosch & Schümmer, 2007)	X	X	X	X	X
Letter of Recommendation (Lukosch & Schümmer, 2007)	X	0	-	-	-
Expert Finder (Lukosch & Schümmer, 2007)	F	F	-	-	-
Hall of Fame (Lukosch & Schümmer, 2007)	-	X	-	-	-
Reward (Lukosch & Schümmer, 2007)	X	0	-	-	-

X = integrated; 0 = not completely integrated; F = Freemium, - = not integrated; [1]: Twitter is following a very open level of free speech and does block accounts only in extreme rare situations, which might depends on local legal restrictions.

Source: author's construction

As social networks with a high reach the quality inspection is implemented in each of them: In each network it is possible to report content which is provided by the network users to an administrator for the evaluation of the reported content. All networks are developed in those direction that they try do guide users to other users with similar interests, based on their preferences or network interactions. With those, the idea of "Birds of a Feather" is fulfilled. For the pattern "Expert Finder", "Hall of Fame" and "Reward" it is interesting, that those pattern are only implemented in business networks. Even if Facebook, Twitter and Instagram are social networks and people are providing information about their hobbies and interests, it is not possible to search for experts in those fields directly in the search function from the network. In the business networks Expert Finders are available for premium users only. It means that the premium users have no restrictions on the functions in the people search. In both networks it is possible to receive a letter of recommendation or a general recommendation from connected users. The Xing network offers for special active users a button in their profile and lists those users in separate lists like a Hall of Fame. LinkedIn and Xing provide in addition a special button for premium users to display their professional usage of the network. Those might be also count as "paid reward". LinkedIn also allows the publishing of (successful) finished study courses from external e-learning providers, the listing of (scientific) publications, patents and projects or awards.

Table 8

User Protection Pattern

	LinkedIn	Xing	Facebook	Twitter	Instagram
Masquerade (Lukosch & Schümmer, 2007)	0	0	X	0	0
Quick Goodbye (Lukosch & Schümmer, 2007)	X	X	-	X	X
Attention Screen (Lukosch & Schümmer, 2007)	F	F	X	0	0
Availability Status (Lukosch & Schümmer, 2007)	-	-	0	-	-

X = integrated; 0 = not completely integrated; F = Freemium, - = not integrated

Source: author's construction

Each network allows the Masquerade of the personal profile and personal data, but only Facebook has implemented this pattern in different ways, for different groups and depending on the content a person shares. Other networks provide only minor settings, like that the profile can only be viewed by accepted users or that their profile will not appear

completely in search engines. As an opposite for the detail focus on the protection of personal data, Facebook is the only social network which does not allow a "Quick Goodbye" which means that a user can delete his account immediately. Accounts in Facebook are only deactivated and deleted after a period of 14 days. The pattern Attention Screen means that the users have the ability to filter what their attention in the network will get and especially who can contact the user. In the business networks LinkedIn and Xing Premium users have more abilities to filter contacts and to get in contact with other users in the network. In those networks paid users buy trust from the network and can contact more people directly. Due to the situation that only Facebook has currently a chat implementation, only this network can implement an Availability Status for direct communication. In general no network has the ability to set an account of away or in a holiday modus.

Table 9

User Group Communication Pattern

	LinkedIn	Xing	Facebook	Twitter	Instagram
Group (Lukosch & Schümmer, 2007)	X	X	X	0	-
Bell (Lukosch & Schümmer, 2007)	0	0	X	-	-
Interaction Directory (Lukosch & Schümmer, 2007)	X	X	X	-	-
Share File Repository (Lukosch & Schümmer, 2007)	-	-	X	-	-
Vote (Lukosch & Schümmer, 2007)	-	-	X	X	-
X = integrated; 0 = not completely integrated; F = Freemium, - = not integrated					

Source: author's construction

The approach of a Group exists in LinkedIn, Xing and Facebook. Those groups can be founded by each member of the community and focus on the topic the founder of the group want to provide to the social network. A similar approach exists in Twitter with the usage of lists. In lists users from Twitter can be grouped and filtered, depending on the security settings and connections between the list members. It is discoverable in groups from Facebook, LinkedIn and Xing that the Bell pattern is integrated. The Bell notifies members of the group about people which want to join the group or if new posts exists. The Interaction Directory pattern, which recommends new or similar groups to the users of a group, is implemented in all networks which have groups available. Only in Facebook it is possible to Share Files into the Repository of a group. Xing and LinkedIn restrict the sharing to links and images. A Vote can be setup by user from the social networks Twitter and Facebook and shared to the own timeline or into a group.

Table 10

User Awareness Pattern

	LinkedIn	Xing	Facebook	Twitter	Instagram
Embedded Chat (Lukosch & Schümmer, 2007)	0	0	X	0	0
Forum (Lukosch & Schümmer, 2007)	X	X	X	-	-
Flag (Lukosch & Schümmer, 2007)	X	X	X	-	-
Digital Emotions (Lukosch & Schümmer, 2007)	-	-	X	X	X
Interactive User Info (Lukosch & Schümmer, 2007)	-	0	X	-	-
Presence Indicator (Schümmer, 2005)	-	-	0	-	-
X = integrated; 0 = not completely integrated; F = Freemium, - = not integrated					

Source: author's construction

In the current networks only Facebook has implement a real (standalone) chat application. The other networks have direct messaging, but did not allow to setup chat groups or to interact in a real chat environment. Each group in Xing, LinkedIn or Facebook contains automatically a (threaded) forum. The forum administrators can set a flag for important messengers in the forum. Digital Emoticons are implemented in Facebook, Twitter and Instagram as part of the communication within the network. The business networks do not have digital emoticons. Xing and Facebook have implemented the pattern approach of the Interactive User Info which means that additional user information is displayed

when a user is with his mouse of a user in the network. Facebook has also implemented the Presence Indicator for the streaming of live videos, where the video provider receives direct information about the amount of people who are watching the stream. In addition the viewers are also tracked by Facebook and displayed as viewer list. Due to the situation that the group work pattern do not cover all social functions of a social network, the following functions are analysed with the mentioned different pattern languages. The first two patterns are about interactions from external web pages with the social network and the ability to share content into them.

Table 11

External Social Network Pattern

	LinkedIn	Xing	Facebook	Twitter	Instagram
Social Links (Tidwell, 2010)	X	X	X	X	-
Sharing Widget (Tidwell, 2010)	X	X	X	X	-
X = integrated; 0 = not completely integrated; F = Freemium, - = not integrated					

Source: author's construction

The ability to share content into a network is not implemented by Instagram. Instagram does not allow social links to share content into the network. At the same time Instagram is the only network which does not used on of the advantage of those function by the integration of sharing widgets from the social networks. Those have the ability to provide information how often a dedicated content is shared into a network, liked or followed in a network.

Table 12

Other Social Network Pattern

	LinkedIn	Xing	Facebook	Twitter	Instagram
Comment (Crumlish & Malone, 2015)	X	X	X	X	X
Events (Crumlish & Malone, 2015)	-	X	X	-	-
Hastagging (Crumlish & Malone, 2015)	X	-	X	X	X
Reposting/Share (Crumlish & Malone, 2015)	X	X	X	X	-
X = integrated; 0 = not completely integrated; F = Freemium, - = not integrated					

Source: author's construction

All social networks allow comments. Those mean that users are able to add text to content which was shared into the social network. Facebook and Twitter allow the including of images onto those contents. In all networks text and outgoing links can be included to a comment. The handling of events is integrated in the social networks Facebook and Xing. Xing itself has established a separate portal which allows the handling of the purchasing procedure for events. Due to their focus on text (Twitter) and image (Instagram) message sharing, Instagram and Twitter do not offer the handling of events. The use of Hashtags is possible in Facebook, LinkedIn, Instagram and Twitter. In all networks hashtags or tags are used by the use of the hash character (#) to identify keywords. The search from the networks which supports hashtags priors in its search results those results which contains the search term as hashtag. Also the search in the network is directly possible by clicking on the hashtag itself. Both business networks, Facebook and Twitter allow the Reposting and Sharing of existing content. This function means that a content, which is provided from a user, can be forwarded onto the timeline of users and is automatically shared with friends or follower.

Table 13

Other Social Network Functions

	LinkedIn	Xing	Facebook	Twitter	Instagram
Company pages	X	X	X	0	0
Emotional recognition	0	0	X	0	0
Sharing into the network (Text, Images, Videos)	X	0	X	X	X
Mentioning of users	X	-	X	X	X
X = integrated; 0 = not completely integrated; F = Freemium, - = not integrated					

Source: author's construction

Beside the patterns which were used in the research some functions in the social networks could not be covered or the descriptions of the pattern are too broad to cover only one function. Facebook, LinkedIn and Xing provide dedicated content pages for business. In the business networks LinkedIn and Xing those pages are company presentation pages with mostly static content. In both networks the main focus of the company pages is to promote job offers from company which owns the company page. In Facebook business pages are an offer for business to go into a relationship with (prospect) customers and a main social media channel. The social networks Twitter and Instagram provide the verification of accounts for companies and personalities of public life. All evaluated social networks allow the response to content in the network via emotions. The emotions includes a "like", "interesting" or "fav" marker for the post or comment. Facebook allows as first and only social network to react with different kinds of emotions on a shared content. All social networks allow the sharing of media into the networks via a post. Xing does not allow video content and restrict the sharing to images and text. The other networks allow the sharing of text, images and videos. Facebook also allows the sharing of live video. The mentioning and the direct interaction with a user of a social network in a post or comment is possible in the networks Facebook, LinkedIn, Twitter and Instagram. In those networks the mentioning starts with an at sign (@) at the beginning and is followed by the user name. The user which is mentioned receives normally a notification about the mention. In addition other users can go via the mention, which works as hyperlink, to the profile of the mentioned user. This feature might be restricted due to the privacy settings of the mentioned user.

Table 14

Overview of functional integration in social networks

Social Network	**LinkedIn**				**Xing**				**Facebook**			**Twitter**			**Instagram**		
Level of functional Integration	**-**	***F***	***0***	***X***	**-**	***F***	***0***	***X***	**-**	***0***	***X***	**-**	***0***	***X***	**-**	***0***	***X***
Aggregated amount of functions	8	4	5	17	7	4	8	16	5	4	26	13	8	14	19	5	11
Detailed results:																	
User Welcome Pattern (4)	-	2	1	1	-	2	-	2	-	2	2	-	1	3	1	-	3
User Guidance Pattern (6)	1	1	-	4	-	1	2	3	4	-	2	4	1	1	4	-	2
User Protection Pattern (4)	1	1	1	1	1	1	1	1	1	1	2	1	2	1	1	2	1
User Group Communication P. (5)	2	-	1	2	2	-	1	2	-	-	5	3	1	1	5	-	-
User Awareness Pattern (6)	3		1	2	2	-	2	2	-	1	5	4	1	1	4	1	1
External Social Network Pattern (2)	-	-	-	2	-	-	-	2	-	-	2	-	-	2	2	-	-
Other Social Network Pattern (4)	1	-	-	3	1	-	-	3	-	-	4	1	-	3	2	-	2
Other Social Network Functions (4)	-	-	1	3	1	-	2	1	-	-	4	-	2	2	-	2	2
X = integrated; 0 = not completely integrated; F = Freemium, - = not integrated																	

Source: author's construction

The overview displays that Facebook has the deepest functional integration of all networks and follows with this the approach to provide an ecosystem for social interaction in the Internet. Both business networks, Xing and LinkedIn, have a similar level of integration, but displays small differences. Those details might depend in the international and national approach of the networks. The field of Welcome Pattern are integrated in the most of the networks. The nice networks Instagram and Twitter provide in this field a high integration to bring new users together based on their interests. The Guidance Patterns are more focused by the business networks. The field of Protection Patterns are similar implemented in all networks. Group Communication Patterns are mostly integrated by Facebook. The level of integration of those patterns in the nice networks is on a quite lower level. The field of User Awareness Patterns are also low integrated in those networks. External social network pattern are only not integrated in Instagram and can't be used for interaction with users, which makes Instagram in this field very special. The groups of Other Social Network Patterns and Other Social Network Functions are basically implemented in most of the networks and seem to be standard functions. Only Instagram

has here a low level of integration. The German network Xing is beside this the only network which has not implemented Hastagging and the Tagging of users. Maybe those are functions which are not proper used in German networks so far.

Conclusions

The research provides an introduction to the structure of open and closed electronic markets and the differentiation within electronic markets. Due to the reach of social networks and their impact on business regarding social media the social networks with the highest reach in the western world were evaluated regarding their functions. For the comparison of functions, within the social networks, standardized pattern were used. The results show the following findings:

1. The available functions, which can be used for social media and for customer communication, are depending on the targeted network. Not all functions are available in each network.
2. Due to the business case the reduction of functions can be accepted by the user base. Online social networks distinguish itself on the target market by the providing of different implemented features.
3. Social networks without a business approach are focused on emotions and the usage might be anonymous.
4. Facebook provides the deepest integration of functions (especially in field of group communication, awareness and protection pattern) to an online ecosystem, but allows as only network not a Quick Goodbye.
5. The business networks LinkedIn and Xing have nearly similar (freemium) functions:
   5.1. Only business platforms were able to establish premium accounts at the current time (May 2017).
   5.2. Especially search, direct communication and contact handling are features which are important for business platforms and which are restricted similar in both networks.
6. Even if all networks can be used for social media marketing, especially the non business social networks, Instagram strictly avoid the sharing into the network and re-sharing in the network and focuses on own content.

The results do not provide information about the preferences for the usage of the network by their users. For the usage of social networks several reasons may apply. (Joinson, 2008) e. g. identified as main reasons for using social network the wish to stay in loose contact with other people and the exchanging of pictures or information. (Bimal et al., 2009) consider the personal interaction between friends and acquaintances to be the basis for networking in social networks. In this regard, sending birthday wishes is identified as a metaphor, according to which the user distinguishes between active and former friendships. Here exists a gap in the description of the pattern which focuses on the interaction or design within a social network. They did not contain special recommendation for business approaches like social media. To evaluate the usage of social networks for social media marketing the following research questions will be followed in the next research steps:

R1: Which models exists to explain social interaction in electronic markets?

R2: Which functions can be used especially for interactions with clients from the business side?

To use functions from a social network for business communication and transactions the steps in a communication with customers and prospects should be evaluated. For this the term of business transactions should be evaluated more in detail which leads to the following research questions:

R3: Which models exists to explain business transactions in electronic markets?

R4: Which business interactions or transaction steps can be identified for a support through social media?

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THE ROLE OF CLIENTS AS AGENTS IN BUSINESS TRANSACTIONS WITHIN ELECTRONIC MARKETS

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Abstract. This research paper provides an introduction to the theoretical principles from the field of business transactions models in electronic markets. For this research the business transaction models from Beat Schmid and Göran Goldkuhl, which are mostly used for the explanation of business transactions, were analysed regarding their development and compared regarding their phases. In addition to the analysing of the phases from the models for business transactions, the influence of agents on those transactions is researched and transferred on practical customer examples from the field of electronic markets. At last step the usage of agents in the analysed models in the context of socioeconomic variables is evaluated. The results of this research on business transactions and the determined business transactions phases are used for further research in the field of quality ensured business transactions for business oriented social media usage.

Key words: *Business Transactions, E-Business, Electronic Markets*

JEL code: D11, D86, M19

Introduction

This research paper is published as part of a general research project regarding the evaluation of the influence of sociodemographic variable on the usage of Internet services. The usage is researched to provide a more quality ensured usage of social media communication to prospected and active customers during business transaction within electronic markets. The analysed and standardised processing of business transactions allows the management of e-businesses a better client administration, business controlling and business steering. Due to the technological possibilities of e-business a standardization of interactions with the clients is possible. The objective of research focuses on the analysis of existing models for business (action) transactions in electronic markets and the influence of agents on those transactions. The analysis is conducted to evaluate existing research gaps regarding the transfer of those models regarding the usage inside social networks. In this paper the following research questions were discussed:

R1: Which models exists to explain business transactions in electronic markets?

R2: Which business interactions or transaction steps can be identified for a support through social media?

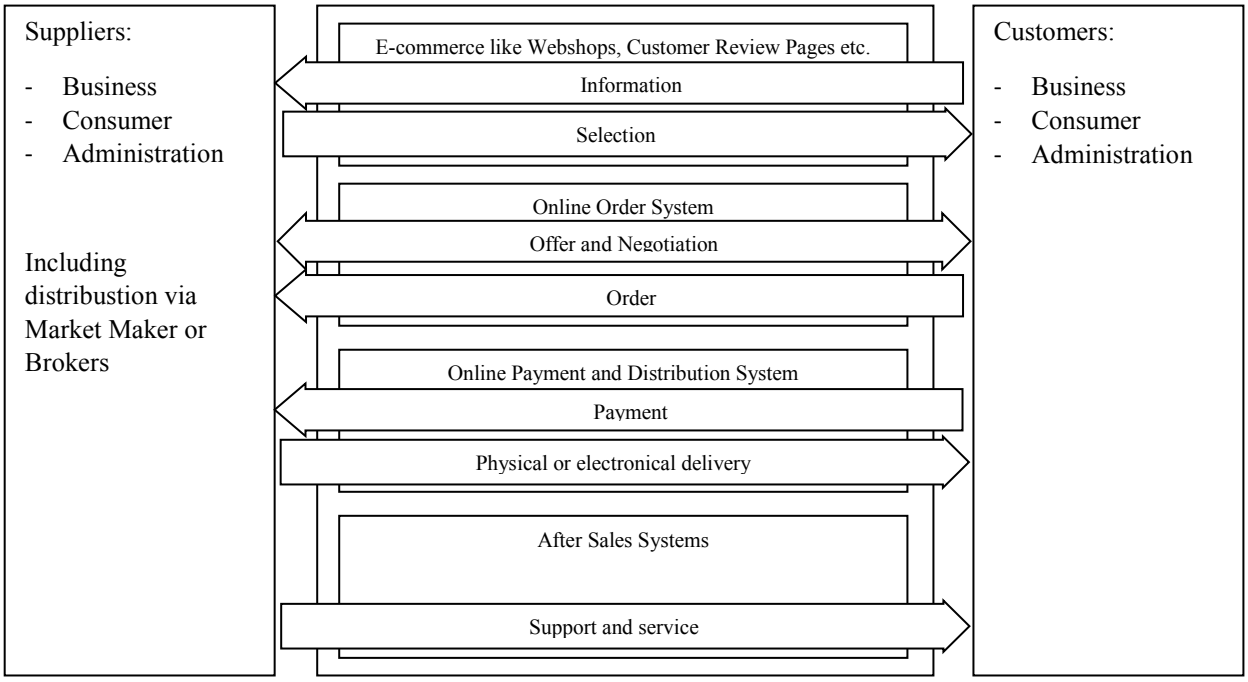
R3: Does socioeconomic characteristics needs to be considered for business transactions within electronic markets?

To evaluate those research questions a document analysis of the state of the art publications in the field of business transactions is proceed to provide a comparison between the existing business transactions models to display similarities and differences for client interactions. The results will be used for a further standardisation of business transactions in the context of often used functions with social networks within the field of social networks for a more quality ensured client interaction.

Research Results and Discussion

For business in electronic markets several models exist to explain the relationship between suppliers and customers: Those models explain the different interaction phases. In those models the relationship between suppliers and customers

regarding their interactions are researched. An example for business transactions in e-commerce shops is provided by (Hermanns & Sauter, 2001).



Source: author's construction based on (Hermanns & Sauter, 2001)

Fig. 1. **Phases of electronic business**

Since decades scientist analyse business interactions on an abstract level with the target to standard interaction and to aggregate similarities. For a more abstract explanation and analyses of business and of transactions in electronic markets, models for business transactions were developed, changed and enhanced. In this research the models from Göran Goldkuhl and Beat Schmid will be discussed and compared regarding their structure, their understanding of media and their usage and view on agents. The research from Göran Goldkuhl focuses on the Language/Action (L/A) tradition, which emphasis actions, communication and interactions in the relations between customer and supplier (Goldkuhl & Lind, 2004) and focuses in this mainly on B-2-B. B-2-C might also be possible, but is not his focus. Beat Schmid focuses on his research on the transactions in the context of the value chain approach (Schmid, 1993). Due to (Schmid, 1993) electronic markets cannot be clearly defined. For this the focus of his work is on the trading within marketplaces or in networks which supports trading based on an electronic fundament. Instead of electronic markets Beat Schmid used the term business media.

1. Models for Business Transactions in Electronic Markets

(Schmid, 1993) separated as first business transactions, especially for business media, into different steps. For each step he provided a context in which the step or phase is started or preceded. He recognizes for his phase model, that the developed models might be different depending on the branch and it might be recommended to refine those phases for different branches. The approach of his phases should be usable for B-2-B and B-2-C relationships.

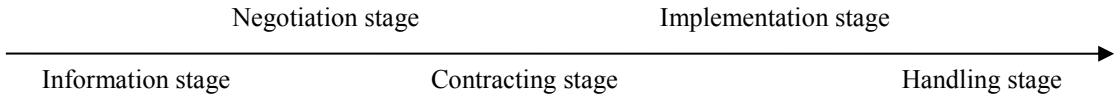
Table 1

First phase model of business transaction

Phase	Knowledge	Intention	Agreement	Handling
Context	Information	Target definition	Negotiation	Execution

Source: author's construction based on (Schmid, 1993).

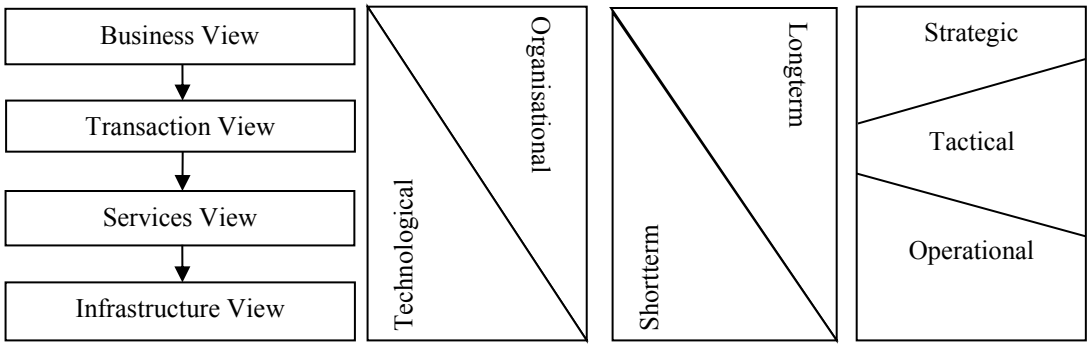
The approach from 1993 was changed in 1994 by a research follower from Schmid who removed the target definition, because the intention might be already needed for the information phase. The negotiation phase was extended by the contracting stage and for the execution phase the implementation and handling (service) phases were differentiated.



Source: author's construction based on (von Aadorf und Tobel, 1994, p. 162).

Fig. 2. **Stages of a Business Transaction**

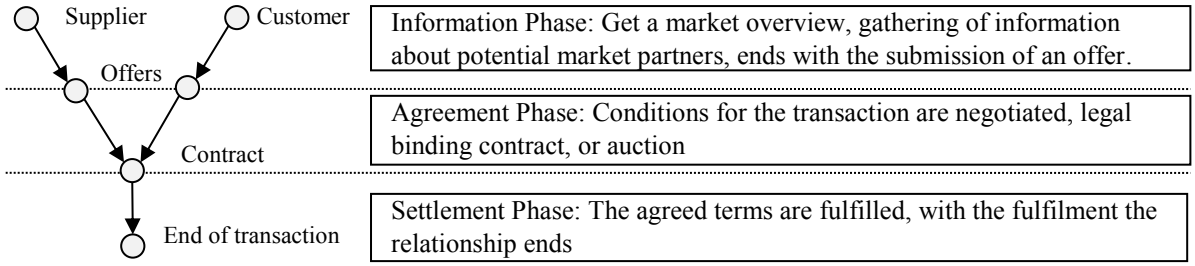
In the next research step (Lindemann & Schmid, 1998) extended the modelling approach for business transactions with elements for a reference model for electronic markets by introducing different views and their application onto business management.



Source: author's construction based on (Lindemann & Schmid, 1998).

Fig. 3. **Management characteristics of business transaction views**

In addition the phases in a business transaction were also reviewed and reduced down to three phases. The contraction phases and the fulfilment were reduced to one phase each.



Source: author's construction based on (Lindemann & Schmid, 1998).

Fig. 4. **Phase model of market transaction**

The model for management characteristics of business transaction views and the phase model for market transactions were combined in (Schmid et al., 1999a) into one model. In this model the views on business media, as term for electronic markets, were rearranged and for further usage finalized. The transaction view includes in this construct the different steps of a business transaction between suppliers, prospects and customers.

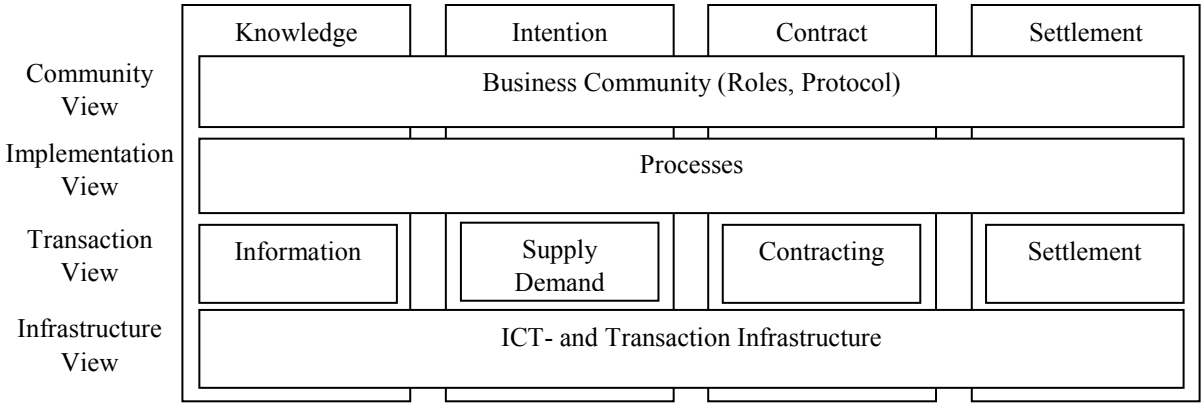
Table 2

Views on business media and transaction view phases

	Contains/Focus on	
Community view	Business community (Roles, Protocols)	
Implementation view	Processes	
Transaction view	*Information*	The participants exchange and increase their knowledge.
	Supply/Demand	Formation of the will by the participants to supply or demand something
	Contracting	Negotiation about a contract. If successful a contract is established.
	Settlement	Contracted products and services are served and fulfilled.
Infrastructure view	ICT- and Transaction Infrastructure	

Source: author's construction based on (Schmid et al., 1999a)

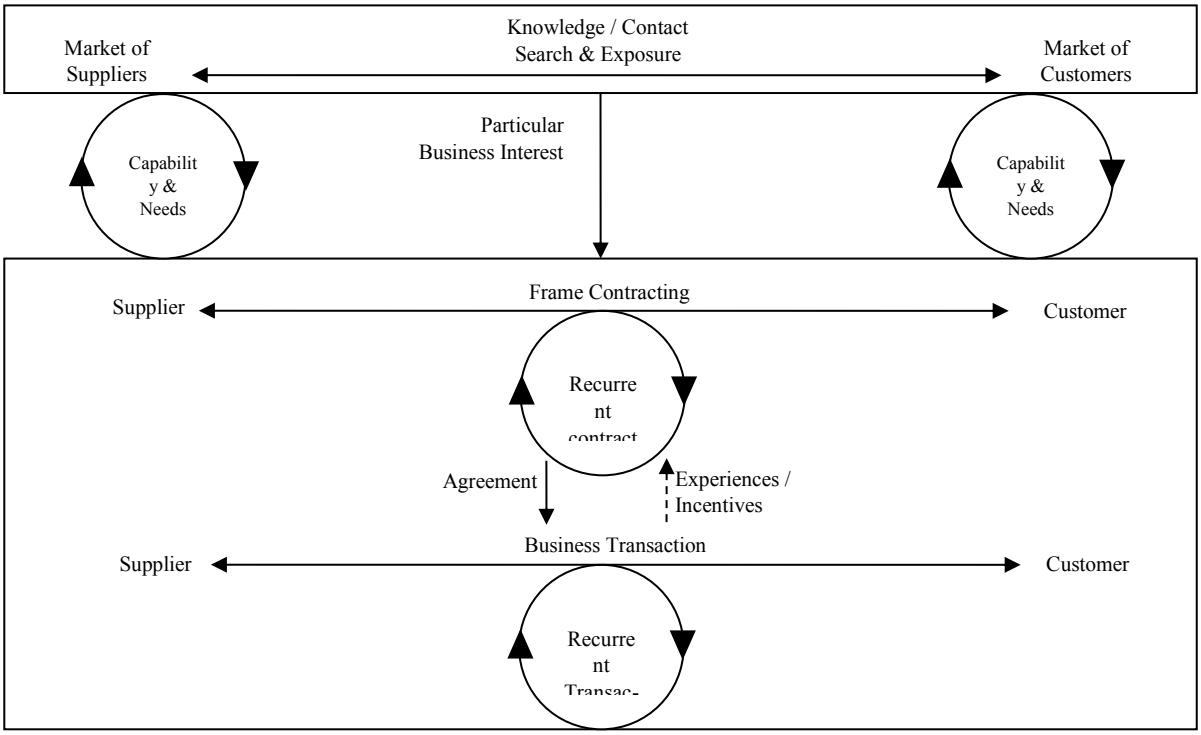
The media reference model which was developed later by (Schmid & Lechner, 2000) is constructed as model for e-business, e-commerce, CSCW and CSCL systems, online shops and Intranets. Those systems were understood as communities. Communities are defined as a set of natural and/or artificial agents which aims on the designing of media. Designing means in this case interaction and with this the change of the content within the medium. In the community the agents share a common language and world, common values and pursuing common interests. The agents are connected via a medium on which they act in roles.



Source: author's construction based (Schmid & Lechner, 2000)

Fig. 5. **The media reference model (MRM)**

Similar to the models for business from Beat Schmid the researcher Göran Goldkuhl developed models for business transactions in electronic markets. The models which were developed by Goldkuhl strongly focus on a B-2-B relationship. B-2-C might be possible. In his research Goldkuhl follows the Language and Action tradition, which is based on the speech act theory and the communicative action theory by Habermas. His first model from (Goldkuhl, 1996) focuses on four business transaction stages. The basis model was further developed into a six phases Business Action Theory (BAT) model (Goldkuhl, 1998) and was revised in (Goldkuhl & Lind, 2004). In the BAT by (Goldkuhl & Lind, 2004) business relationship is as well understood as an overall process and relationship beside business transactions. The BAT model extends in his construct the Action workflow approach which provides preparation, negation, performance and acceptance as part of a business workflow. The disadvantage of the model is in the opinion of (Goldkuhl & Lind, 2004) that the model is more complex in comparison to the normal workflow model, but the BAT is the semantically richer model. The Business Action Theory model was later extended with a more detailed description for the different steps of the transactions (Goldkuhl & Lind, 2005). At least at this point the model nearly completely focussed on a B-2-B relationship and focuses on the feedback between the interaction steps.



Source: author's construction based on (Goldkuhl & Lind, 2005).

Fig. 6. **Levels of business interaction**

In the field of operative business steps Beat Schmid and Göran Goldkuhl have comparable phases. Beat Schmid itself provides a more complex approach in the field of business s views, but if the focus is only set on the transactions similarities exists. From his research background Beat Schmid focus more on business management. Göran Goldkuhl, which is has a more technical background, focuses in his research more on the interaction and the relationship in electronic markets and especially in the field of B-2-B.

Table 3

Comparison of the transaction phases by Goldkuhl and Schmid

Phase	Business Transactions (Goldkuhl, 1996)	BAT (Goldkuhl, 1998)	BAT (Goldkuhl & Lind, 2004)	Transaction View (Schmid et al., 1999)
1	Proposal	Perquisites	Business Perquisites	Information (Participants exchange and increase their knowledge about products and services)
2		Business interests (Offer, Desire & Demand, Exposure & Contact search, Contact establishment & proposal)	Exposure & Contract Search	
3	Commitment		Contact (Establishment & proposal)	Supply & Demand (Formation of will by the participants to supply or demand something
4		Contract (Delivery promise, Contract & Order)	Contractual (Contract & order)	Contracting (Negotiation about a contract. If successful a contract is established.)
5	Fulfilment	Fulfilment (Delivery & payment)	Fulfilment (Delivery & payment)	Settlement (Contracted products and services are served and fulfilled)
6	Completion (acceptance/claims)	Completion (Satisfied/unsatisfied)	Completion (Satisfied or unsatisfied / claim)	
7		Claim		-

Source: author's construction

The comparison of the models displays that in the field of transaction steps several (similar) steps can be found. The starting point is in all models similar. Schmid and Goldkuhl have as first an information phase where people/prospect

customers have the demand for information about products or services. The phase is followed in both approaches by the research for possible suppliers and the evaluation of contacts. The evaluation of contracts is followed by the contract period. The following completion period differentiate. Schmid focuses on one step. Goldkuhl differentiate between the fulfilment and the completion of the contract. Interesting is the point of claims which is mentioned by (Goldkuhl, 1998) where the model provides more detail, but like Schmid mentioned for his model, the model might be extended and changed for specific branches. Especially in the current time with social media those handling might be especially interesting for social media and interaction with customers in electronic markets. In general the steps seem to be transferable for a B-2-C interaction and usable for social media approaches. It can be expected that the most people will research for information about a product or service before the purchase a product or service. A contract negotiation is based on the standardized electronic interaction, with standardized Terms and Conditions in the B-2-C field, mostly not necessary but still a contract needs to be closed and delivery rules might differentiate. The fulfilment is necessary and especially with the interaction of social media the handling of claims occurs in B-2-C often. Out of the compared phases the following business transaction phases should be considered for social media interaction:

Table 4

Extracted business transaction phases

Information	In the Information phase peoples are receiving information about products or services. In this phase awareness for a product or service can be created and users can become prospect customers with the intention to purchase a product or service in general.
Proposal	In this phase a prospect customers is in the period of a dedicated search for supplier for a specific product or service. The decision reasons for a supplier might be a fitting relationship or price.
Commitment	In the commitment phase the contract for the order is finalised and accepted. That includes the delivery of the product or the service and related delivery information.
Settlement	During the settlement phase the product or service is received by the customers. The settlement includes the use of a service during a contract period.
Claim	This phase contains the handling of claims regarding the product or service which was purchased during the business transaction. The handling of claims is necessary to establish a robust customer relationship and to avoid negative communication by the customer in media. For services claims might happened during the settlement period and maybe not only afterwards.

Source: author's construction

2. The Importance of Agents in Electronic markets

They researched business transaction models were focussing so far on the business transactions itself. Those miss the focus on the customer and supplier. The recurrence and repeating of a business process is depending on the experience between suppliers and customers. A more extended focus, which includes the customers more detailed is required due to the importance of customers and they value they add to a business transactions. A suitable explanation how customers should be understood has been proposed by Levitt (1960, pp. 44–45): 'In business, the followers are the customers. To produce these customers, the entire corporation must be viewed as a customer-creating and customer satisfying organism. Management must think of itself not as producing products but as providing customer-creating value satisfactions.' Following this explanation prospects customers or people which interact with a business should be considered as customer, also when the do not purchase a product or service directly.

Goldkuhl included the interaction between customers and suppliers into his modelling. For him the long-term development with customers is important (Goldkuhl & Lind, 2004). His model was first only for business transactions, but was later extended for an interaction period with a knowledge and intention phase. In (Goldkuhl, 2004a) a socio-pragmatic approach was introduced and the organizational knowledge of the agents in the business interaction were considered. In this approach the social character of a person was missing. Covered is in this case the social interaction between both sides in a contracted situation ("Actor must have signed things"). In (Goldkuhl, 2004b) the socio-

instrumental pragmatism was introduced in the socio-pragmatic ontology (SIP-ontology). In this each social phenomenon and interaction has an origin and is influenced by the situation in which is occurred. The interaction in the theoretical model occurs with intra- and intersubjects parts of the agents and exchange with the intersubjective worlds. The participants in the interaction perform in this action for a dedicated outcome:

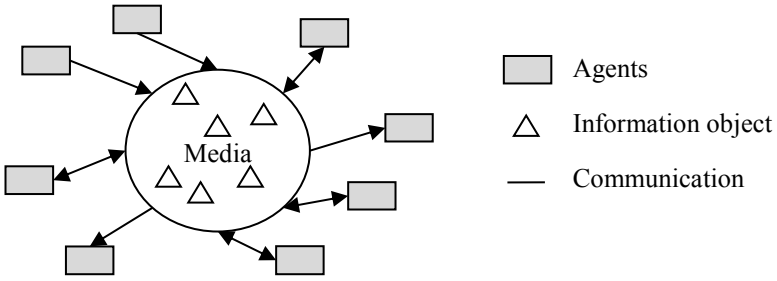
1. Through planned and intentional development and with this by constructed communication.
2. Through intentional habitualisation of successful practices, based on experiences and habitus.

His approach is based on the philosophical approach of Habermas, where the reality is influenced by the intra- and intersubject parts of the human beings (agents). The intersubject parts influence the intersubjective worlds with norms, rules, methods and routines and linguistic competences. The intersubjective worlds interacts with in the field of intrasubject worlds with the intersubjects worlds of other participants in the business transaction. To evaluate those interactions (Goldkuhl, 2004b) determined six questions for the analysing of a transaction:

1. What it is: The Content determination
2. Where does it exists: The determination of ontological position
3. What is the context of it? The determination of context and related phenomena
4. What is the function of it? The determination of functions and purposes
5. What is the origin of it? The determination of origin and emergence
6. How do we speak about it? The determination of language use

The theoretical reflection focussed on the analyses of the linguistic competences from a person and tries to develop a theoretical linguistic model for the support of business interactions. As last step (Goldkuhl & Lind, 2008) increased the relation between customers and suppliers with a more detailed characterization on expectations, results, further actions. Those theoretical frameworks had no strong or deep transfer from or onto social sciences or business science. The models do not include theories about social differentiation, group buildings or social capital based on socioeconomic variables.

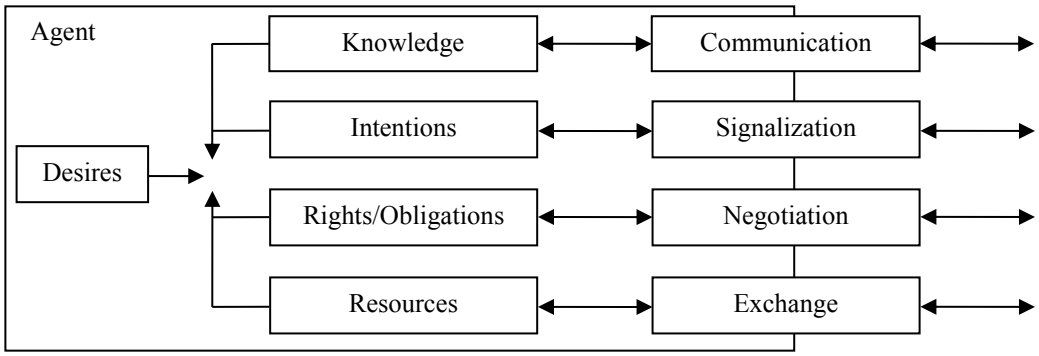
In the models from Beat Schmid customers and suppliers act as agents in media. With the increasing use of media for customer attraction and customer relationship in the current time a shift in relationship marketing is happening. Media as part of electronic markets or as market itself makes the interaction with a customer more complex. The definition by (Schmid, 1997) helps to understand how the interaction between agents and media proceed: Media contains the three components 1) logical space, with syntax and semantic of the information, 2) the channel system, for the transportation of information, and 3) the organization, for the determination of the roles and behaviour which is expected from the agents. Agents communicate information through the logical space, via the channel system, within the organization of the system. This approach was extended in the research by (Schmid et al., 1999a) where media become a more formal model for communities and platforms and in which information is transported in channels as knowledge by agents. The research was extended in (Schmid et al., 1999b) into a media model for multi-agent usage. Agents are capable of acting in media platform according to their knowledge. The information they dispose contains facts and procedural information as well as the knowledge how to apply facts and procedural information on the platform. Agents are capable of processing information in general and of computing the entailment relation from axioms. Agents can be formalized as specifications with a signature, a set of axioms, meta-rules how to apply the axioms, and a strategy how to proceed in computation.



Source: author's construction based on (Schmid et al., 1999b).

Fig. 7. **Media as Sphere for Agents**

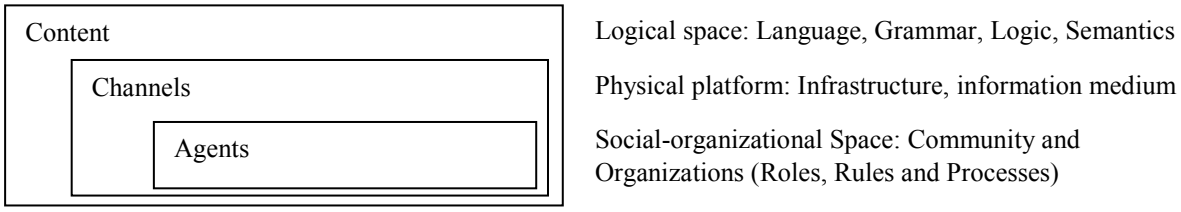
(Schmid & Lechner, 2000) extend this approach by defining media as a model to envision, design, formalize and implement platforms for communities. The media concept envisions media more as sphere for communities of agents. Media is modelled as organized channel systems of multi-agents which exists as physically open structures and which are distributed over space and time. The model contains a logical space with syntax and semantics of the information which is available on the platform. An important point in the developing was that a community is a trust generating environment (Schmid & Lechner, 2000). The community and the awareness of the community create trust that is prerequisite for performing transactions. Real communities have social relations grown over time. In those environment the agents interacts. The approach for the agents was defined more in detail in (Schmid, 2001). In this definition the desires from the agent regarding a business transaction are influenced by the knowledge, intentions, right/obligations and the resources which are available. The desires of course influence the mentioned factors and each media interactions from the agent changes directly the status of the agent.



Source: author's construction based on (Schmid,2001).

Fig. 8. **Example for Agent architecture**

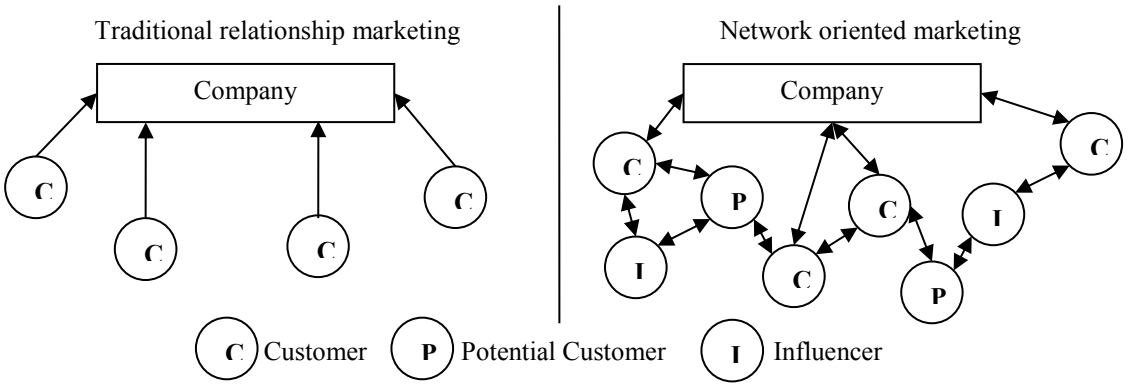
As last step in his research (Schmid, 2002) abstracted and redefined his media model to included media channels for personal business media which includes the exchange between communities. In this model also autonomous agent can communicate about products, contracts and their execution.



Source: author's construction based on (Schmid, 2002)

Fig. 9. **Media model 2002**

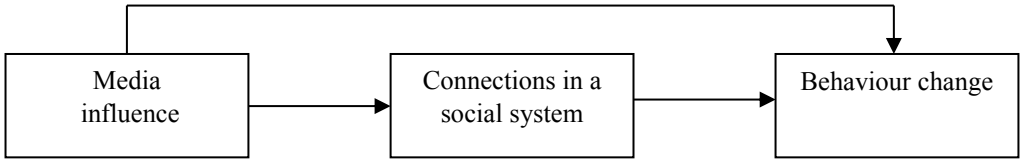
The definitions from Schmid displays the raising complexity of interaction with agents in a media and supports the currently process of the changing from traditional marketing, with a direct interaction between businesses and customers, to a network oriented marketing approach where customer, potential customers and influence each other.



Source: author's construction based on (Groeger, 2011)

Fig. 10. **Network oriented market perspective**

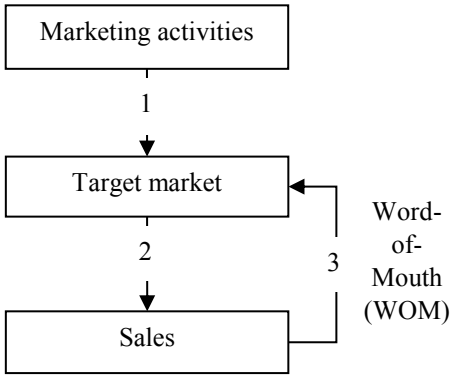
Depending on the chosen media marketing uses various methods of communication, material or sales approaches to reach customers. Media, such as television, can influence agents in their purchasing behaviour and also in their ideological views, social ties and other behaviour (Bandura, 2011).



Source: author's construction based on (Bandura, 2011)

Fig. 11**. Influence of the media on the behaviour of people**

The influence on the agent through the media is important to consider, because in the new market with a network oriented structure those connections are currently used on the so called "Word-of-Mouth" approach. In this approach customers or people which are influenced on the target market generate new sales through the positive sayings about the products or services.



1. Marketing activities are defined as controllable variables to influence the target market.

2. Individuals in the target market purchasing the supported products and becoming customers.

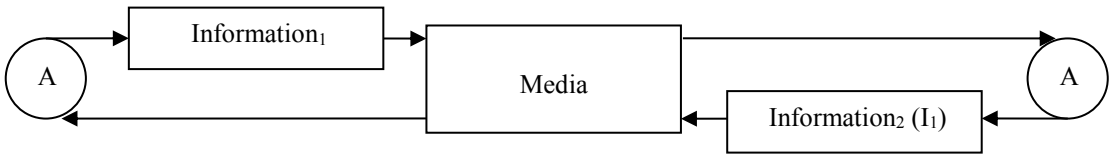
3. Existing customers are influencing potential customers by WOM in the target market.

Limitation: The ability to influence WOM is not included. WOM itself is influenced by the scale of sales.

Source: author's construction based on (Groeger, 2011)

Fig. 12. **Structure of traditional diffusion models**

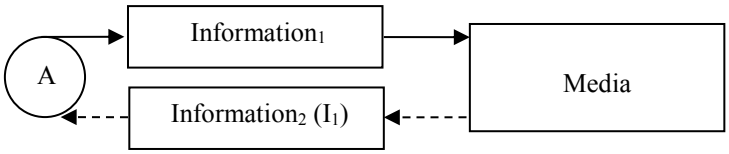
To understand the interaction between agents and media the interaction models from (Staehler, 2002) should be discussed. Staehler different three kind of interaction of agents with media: The manipulation of two agents through media, the manipulation of the existing media through the agent and the manipulation of the agent by the available media. Each of those models can include the usage of modern electronic market service like a social network.



Source: author's construction based on (Staehler, 2002)

Fig. 13. **Agent architecture – manipulation of the agents through media**

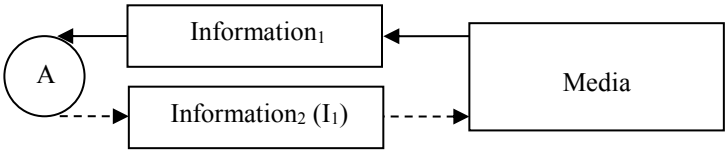
A practical example for the manipulation of agents through media would be a product review in a social network or on a product review page. A product review is stored as Information1 by an agent A1 after the completion of a purchase in a network which allows customer ratings on products and services. The media service is storing the information and displays the information to other customers. In this case another agent might comment on the information and stores the information in the media service as Information2 and as extension of Information1. The agent A1 can now see the comment. The agent A2 might be a request from the customer service from the company which is mentioned regarding more details of the review. In this the supplier can interact with the customer in the business transaction via the internet and via social media. In general a business might use such a transaction in general as a positive way for feedback and may trace those interactions.



Source: author's construction based on (Staehler, 2002)

Fig. 14. **Agent interaction with media – manipulation of the media through agent**

Slightly different is the example for the manipulation of the media through the agent: An example would be a product research in a search engine to gather information about a product. In this case an agent would send a search request containing the Information1, containing a fitting search term. The media, in this case a search engine, would provide the search results as Information2 for the search product. Those results might include product ratings from social networks or product rating pages. An additional example would be the usage of a chatbot: In this case an agent would send a message with the Information1 into social network. The media, in this case the server with the chatbot application, response with the Information2 on the request.



Source: author's construction based on (Staehler, 2002)

Fig. 15. **Media Agent interaction with media – manipulation of the agent through media**

In the case of the manipulation of the agent through media a request for interaction is a practical example. With the current availability of GPS in smartphones media can estimate the position of a user. If a user is at a place the media can send him automatically Information1 on his mobile device. As part of the information the user can be requested to participate on a special offer or provide Information2 about the place. The information can be customer feedback or a general rating of the place. The information would be then stored in the media and would be part of the ending of a business transaction (positive or negative). A more traditional example would be the sending of newsletter as e-mail to

an agent with special offers as Information1. The agent can now react on the offer and possible send an order as Information2 to the media.

An all case the interaction via the media can and possible will influence the agent. The reaction and response of the agent in the different situations might differentiate. In this environment it becomes important to be aware of the agents which are in the market and which decide to interact in the market. Before and during business transaction those agents are influenced by several factors which influence the desires from the agent. Regarding the comparison of Beat Schmid and Göran Goldkuhl for their understanding of customers and suppliers Beat Schmid focuses directly on media and the pure interaction of agents with media. His approach would be more capable for the analysing of social media marketing. The agent interaction approaches from Staehler can be transferred into his model and can use his approach, including the idea of network oriented marketing.

The approaches from Beat Schmid and Göran Goldkuhl are not restricted in their understanding of agents on B-2-B and will be usable for B-2-C. A missing aspect from Beat Schmid might be the long term relationship which is focussed by Göran Goldkuhl. The idea from Göran Goldkuhl to integrate intra- and intersubject influences from agents and from the (real) world might be the an aspect which needs to be evaluated from a more management science oriented perspective and with a lower focus on philosophy to provide more measurable results.

Conclusions

The research displayed that similarities exist in the different stages of business transactions in the approaches from Beat Schmid and Göran Goldkuhl. Beat Schmid itself provides a complete framework for business interaction based on the different views and management levels of a business. Goldkuhl provides here a socially more complex approach, which might a bit too philosophical for management science. In the field of the understanding of electronic markets the definition of media by Beat Schmid is highly usable for social media. Both approaches take social factors into consideration. Those should be evaluated more in detail for the dedicated usage of functions within social networks.

From the research the following findings can be abstracted and taken into consideration for further research:

1. Both approaches can be used for B-2-C interaction and with this for social media marketing,
2. The extracted business transaction phase should be used for a quality ensured social media marketing model.
3. The approach of media and agents needs to be considered for business transactions due to the reduction in complexity and the abstract description which allows a more quality ensured transfer.
4. The influence factors on agents needs to be evaluated due to the long-term relationship goal of social media. For this the idea from Goldkuhl regarding the analyzing of the interaction between customers and suppliers should be taken into consideration. For this it might be analysed which content is involved in a interaction during social media marketing, in which context the interaction happened and which functions might be used or which functions are targeted. In the term of the context it might be considered to analyse how the communication is preceded.

The results lead to the following future research questions:

R1: Which models for the influence of sociodemographic variables on human beings are established?

R2: Which identified variables in those models are mandatory for additional research?

R3: Which social media interactions can be identified to support business transactions in electronic markets?

R4: Which context and functions can be identified for social media marketing interactions?

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ACCOUNTING DEVELOPMENT OFTECHNOGENIC ENERGY RESOURCES

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Abstract. In the context of the development of energy efficiency and of the environmental problems solution related to the municipal waste management, it is urgent to determine the resources increment for economic development of the country and of the individual organization. Therefore, there is the need to reflect information about methane formation in the accounting system of organizations that carry out municipal waste disposal and biogas extraction. Therefore, the authors set forward **the objective** of the research:to develop the accountof technogenic gas resources stocks (biogas).

For the purpose of the achievement of aim, the authors apply generally accepted economic research methods. Authors have analyzed the cycle of changing substances: "municipal waste - biogas stocks in the body of the landfill - biogas flows to the economy" and have considered in this paper biogas stocks as the energy potential of separate organization.There isresearched the economic essence of the new accounting object "technogenic gaseous resources of municipal waste" as a long-term asset, which is the part of mineral resources(natural assets).Having analysed IAS (IFRS) and Belorussian normative documents of the natural assets account, as well as the points of view of scientists and accounting specialists the authors have proposed the model of the account and reflection in financial statements of technogenic gas resources stocks,allowing to provide with information on the used natural capital for the interested users in two aspects: the cost attraction of technogenic gas resources stocks and economic potential of the used biogas stocks.

Key words: *biogas, mineral resource, municipal waste, natural capital , technogenic energy resource*

JELcode: Q29, Q42, Q53

Introduction

Beginning with the second half of XX century, the globalization of environmental problems, in particular such as climate change and the destruction of environmental elements, and the lack of natural resources, threaten the life and possibilities of the development of subsequent generations at an accelerating pace. Climate change is mainly due to the increase in global emissions of so-called greenhouse gases: carbon dioxide and methane. In the fight against the greenhouse effect, the United Nations Framework Convention on Climate Change (UNFCC) in 1997 developed the Kyoto Protocol, whose task is to regulate and prevent negative impacts on the environment. In 2015, in Paris, was held the Conference to address climate change caused by anthropogenic emissions of greenhouse gases.

Recognizing the importance of these legal innovations, the countries of the world community are developing packages of legal measures of an international and local nature aimed at regulation and protection of the climate. Solutions to environmental problems do not bypass the issues of rational management of Municipal wastes, which are one of the sources of greenhouse gas emissions at disposal sites. The world course of the effective municipal waste management, the possibility of their re-engaging in the national economy is also caused by the depletion of natural resources. Thus, an urgent environmental problem has led to the emergence of a new industrial sector-the extraction of garbage gas (biogas) at burial sites. Avoiding the total dependence of countries rich in hydrocarbons, a reorientation to alternative energy sources becomes the second actual cause of the biogaseous industry expansion.

In order to develop this industry, increase economic growth and regulate climate change, scientific communities, governments and other interested structures pay special attention to information on air emission quota reserves, which are a direct source of government revenues in the international trade of quotas.No less important is the value of the energy

potential of the country's alternative energy sources, whose reserves are included in the calculation of national wealth and macroeconomic indicators of sustainable development. Presence of technogenic gaseous stocks (biogas) is of commercial interest to potential investors.

Speaking about biogas as about an element of technogenic natural capital, it is necessary to note the urgency of the natural capital registration in the economic growth calculation in the 21st century. In 2012, at the Rio + 20 Conference on Sustainable Development, seventy-five countries and the European Commission supported the Communique on the call of Governments, the United Nations system, international financial institutions and other international organizations to take more active measures to include the natural capital in the macroeconomic indicators calculation throughout the world. (A mass demonstration of support measures to integrate natural capital at a summit in Rio, 2012).

The essential factor for sustainable municipal waste management, for quota (permit) reserves regulation, for the forecasting of the development of the biogas resource base, as well as the reflection of technogenic gaseous resource in national accounts of the statistical system and the use of biogas stocks- is the comprehensive information database in organizations that carry out the municipal waste disposal of and biogas extraction. However, at present time the energy potential of landfill gas (biogas) as an alternative source of energy and, simultaneously, as an element of natural capital is not reflected in the accounting system of organizations of the Republic of Belarus and in international practice. The reserves of emission quotas (permits) to the environment are not considered as accounting objects. There is no correlation in the accounting system between the indicators of municipal waste flows, the biogas stocks formation, its consumption flows and the flows of greenhouse gases into the atmosphere.

Among the defined unresolved issues in accounting system**the aim** of this research is the theoretical justification and the accounting development of anthropogenic gaseous resources (biogas) for organizations engaged in waste disposal and biogas extraction.

The object of the research are technogenic gas resources that are derived from municipal waste under the influence of the natural environment. The choice of the research object is due to the topicality of issues of natural resources valuation, reflection them in accounting and financial statements. These issues remain not sufficiently solved, while the indicators of natural resources reserves and their consumption are of practical importance in the context of the transition to sustainable economic development.

In order to achieve the target **the following tasks** shall becarried out:

-to investigate the economic essence of municipal waste in terms of their resource usefulness in economic activities;

-to study the process of formation and the economic essence of biogas stocks (technogenic gaseous resources) from the position of the energy (economic) potential;

-to justify scientifically and recognize biogas stocks as an accounting object;

-to propose a method of biogas stocks evaluation in accounting based on stakeholders preferences;

-to suggest the model of the account and reflecting in financial statements of the biogas stocks allowing to provide information on the used natural capital.

The scientific novelty of the results - is the recognition of technogenic gaseous resources of communal waste (biogas stocks) as an accounting object, as well as the development of accounting methodology for technogenic gaseous resources (biogas stocks). The presented model of natural resources accounting can find its practical application by its implementation in the normative documents of the Republic of Belarus, the CIS countries, the EU.

In the research there are applied the methods of general scientific research in economics: of economic analysis and synthesis, logically – constructive, qualitative methods including the methods of the analysis of normative acts.

Theoretical and methodological basis of a research are: the standard and legislative documents regulating waste management, energy saving, environmental management, environmental protection in Republic of Belarus and

neighboring countries, in the EU; the normative documents regulating accounting in the Republic of Belarus, IFRS; special literature of domestic and foreign scientists; Internet sources.

Research Resultsand Discussion

Sub-part 1 The Economic Essence and the Recognition of theTechnogenicEnergy Resource of Municipal Wastes as an Asset in Accounting

The identification and determination of the characteristics of biogas stocks as an accounting object primarily involves the study of the economic essence of municipal waste and the possibility of their use in economic activities.

According to the Law of the Republic of Belarus 2007 “On waste management”, according to the instructions of the Ministry of housing and communal services of the Republic of Belarus “Organization of separate collection (collection), storage and municipal waste transportation”, The Law of the Russian Federation 1998“On production and consumption wastes”, according to the Model Law of the Interparliamentary Assembly of the CIS member States 1998“On production and consumption wastes”municipal wastes are forming by the individuals consumption and in the process of life; as well as wastes, which are similar in composition and were generated in the course of entities activities. The municipal waste includes food waste (kitchen waste from households, restaurants, retail stores), waste, received during the cleaning and repair of living quarters, the maintenance of adjoining areas, obsolete household items, etc. The Waste Framework Directive- 2008/98/EC clarifies the concept of “bio-waste”, which is similar to the concept of “municipal waste”. At the same time, bio-waste is waste that undergoes organic decomposition, while municipal waste can include things or substances that are not subject to processing by microorganisms of the natural environment.

Conception of Federal Law 2005“On secondary material resources”, Kulagina G.A., Pisareva E.N., Berezovsky P.V. in their writings sing out the fundamental characteristic of wastes as secondary resources-the presence of certain consumer properties that can be involved in the economic process.The European Waste Framework Directive 2008/98/ EC and its derived directives on waste management do not define the category “secondary resources”; however, the document notes that the waste usually has a resource value and the “waste management hierarchy” highlights the possibility of their re-use and extraction of energy from them.

Municipal waste has both a material and an energy value. Material or energy value is based on the intentions of further use of the resource, it is depending on the prevailing consumer properties of the waste. The energy potential of waste is used in practice in a variety ways. For example, waste is burned for heat energyreceiving. In this context, municipal waste is a direct energy resource. Although, in recent years, for environmental reasons, this practice is not welcome.And it is possible to use organic waste in attracting environmental microorganisms and other natural processes to form the energy resource (biogas in landfill). With this approach, it is a mistake to consider the waste from the standpoint of the energy resource, since they are one of the components in the formation of the energy resource.

The analysis of legislative documents that regulate resource saving and waste management in the Republic of Belarus, the Russian Federation, and Ukraine indicates that “municipal waste” is a “secondary resource”, provided that there are technological opportunities for using these wastes in industrial production to obtain raw materials, products and / or energy(Board of Representatives and the Council of the Republic of Belarus, 2007; State Duma of Russian Federation,1998; Supreme Council of Ukraine,1998).

National standard of the Russian Federation“Resource-saving. Secondary Material Resources”, Model Law “On Production and Consumption Waste” adopted by the Decision of Inter-Parliament Assembly of the member-states of the Commonwealth of Independent States, as well as Katunin S.V., Polyvko V.A. recognize wastes as secondary resource, provided that it is economically feasible to use them in production.

Thus, the second characteristic feature of "secondary resources" is the technologically realizable possibility of using waste. At the same time, wastes involvement in the national economy should be commercially expedient and justified.

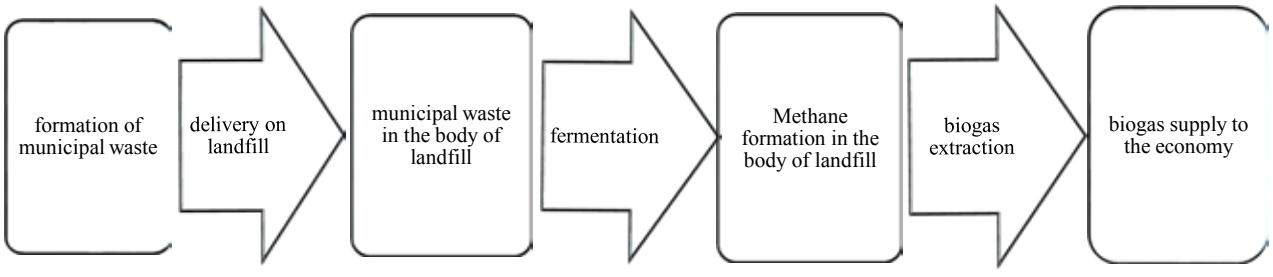
In the presence of consumer utility, technological opportunities and economic expediency of using municipal waste, the secondary resources market is emerging as a combination of economic relations in transferring benefits from one person to another.So, municipal wastes become an economic category and are treated as sale objects. Organizations, whose main purpose is the production of biogas in special device (bioreactor), buy from the procurers the sorted organic municipal waste as raw material. As an economic category organic wastes, which are involved in the production of biogas, treated as secondary resources (raw materials) and, accordingly, can be considered as objects of accounting.However, the sorting of household waste to date has some difficulties, and therefore, the main goal pursued by society is their safe removal by organizations that are engaged in waste disposal. So, the bulk of organic waste mixed with inorganic ones enter the landfill, where all solid wastes lose their resource value.

According to the legislation of a number of CIS countries and the European Waste Framework Directive 2008/98 / EC in the field of wastes management, wastes that must be buried do not represent an opportunity for further processing. Accordingly, buried wastes in specially adapted objects, lose their economic value and are not considered as secondary resources.

In the context of a wasteless economy, all municipal wastes have a resource value. However, in itself the category "secondary resources" as an economic category exists within the technological capabilities of the state and the commercial profitability of garbage use. Investigating the activities of organizations that deal with the waste burial, we came to the conclusion that municipal waste, which are directed to burial do not represent economic value at the period of collection unsorted garbage . Such waste is treated primarily as an object, which it is necessary to get rid of in environmentally safe conditions in controlled landfills. So, the analysis of the economic essence of human waste has shown that their recognition as secondary resources is very conditional.

Next, consider the expected impact of the environment on waste in the landfill body. Fermentation microorganisms break down complex organic compounds (waste) into simpler ones. These less complex organic substances are a source of nutrition for another group of bacteria - methane-forming bacteria, which convert organic acids into methane-biogas (garbage gas).Methane has an energy potential, so gas generation in the body of a landfill can to fill up national raw material base in production, subject to the availability of technological capability and economic profitability of biogas extraction to the surface of the landfill. So, a new economic category is emerging, which affects the level of national security and is one of the conditions for sustainable development.

Below is a schematic representation of the chain of biogas formation in the landfill body.



Source: author's construction based on the studied special literature

Fig. 1. The chain of biogas formation in the landfill body

Thus, municipal wastes in the presented cycle have material utility in the body of the landfill, as they are a product of consumption for a microbiome. Without falling under the definition of the economic category "secondary resources", municipal wastes do not cease to be one of the biogas formation sources. Since municipal wastes by themselves are a

direct threat to the environment (including potential emission of greenhouse gases into the atmosphere), at the stage of collection and accumulation in the body of the landfill, they are subject to mandatory assessment in physical units of measurement.

The methane presence in the biogas shows the natural origin of the resource. The essential difference between this deposit and natural ones is the absence of gas-tight insulation, as a consequence of which, without the rapid extraction of gas at the same time as its generation, the resulting biogas will simply be emitted into the atmosphere, contaminating it (Sirius Group, 2017). Confirmation of the fact that biogas is a part of mineral substances is indicated by an almost identical chemical composition with natural gas.

It should be noted that the quantitative evaluation of biogas in the body of the landfill is being expressed by its stocks, the value of which is being established by specialists on the basis of data on the volume and composition of wastes, temperature in the body of the landfill, climatic conditions and other parameters.

In the economic literature and special internet sources biogas is often seen as a "secondary energy resources" or "renewable energy resources". We analyzed these categories in order to assign additional characteristics to the energy resource as an accounting object.

National Standard of the Republic of Belarus "Energy saving. Basic Terms and Definitions" (1770-2009), the Law of the Russian Federation "On Energy Saving and on Improving Energy Efficiency", the Law of Ukraine "About Energy Conservation", the Law of the Republic of Moldova "On Energy Efficiency", secondary energy resources are interpreted from the standpoint of the energy potential of various energy carriers. Pospelova T.G., Sukhotsky A.B., Kirvel I.I. and others use a similar approach in their scientific works.

National standard of the Russian Federation"Resource-saving. Secondary material resources", gives the following explanation to secondary energy resources: "Production and consumption wastes, reused, with the allocation of thermal and / or electrical energy"(National Standard "Resource-saving. Secondary material resources. Terms and definitions", 2012). This context is understood by us as the existence of energy potential of the wastes, the burning of which leads to the release of thermal energy or electricity. The same standard of the Russian Federation states that secondary energy resources include alternative fuels. Interpretations to the concept of "alternative resources" in the document are not presented.

The Law of the Russian Federation "On Energy Saving and on Improving Energy Efficiency", as well as such authors as Lysienko V.G., Shchelokov Y.M., Ladygichev M.G. consider secondary energy resources not only from the position of *the energy potential of energy carriers*, but also reveal its essence from the standpoint of the gases *energy* leaving the installation; *steam or the physical heat* of the waste gases of the main production. A similar approach is used in the Law of the Republic of Belarus "On Energy Saving", where secondary energy resources are considered as the energy of production waste (losses) obtained in technological units and plants, technological processes.

There is found a positionin a separate literature, where secondary energy resources are interpreted as the result of the conversion/processing of primary energy sources: for example, diesel derived from crude oil refining.

Thus, there is a different interpretation and legislative explanation of the semantic meaning of the concept of "secondary energy resources". Of course, methane formation in the landfill has an energy potential. However, talking about this energy as a "secondary" is not correct enough if we consider it as an economic object in the energy life cycle: "energy resource-biogas (product) –energy".Considering methane formations at burial sites as the latest stage in the substance conversion chain: "organic substances (primary resource) -products -organic wastes-methane (secondary resource) –energy", the use of the term "secondary" is entirely permissible. This context is understood that primary resources are formed and accumulate in natural conditions, but secondary resources undergo transformation and are already formed in technogenic conditions of economic activity

The application of this term also does not bear any semantics if it is interpreted from the standpoint of the possibility of using the energy resource again.

In the West European normative and legislative terminology, in the special literature, within the scope of the possibility of obtaining an energy resource from organic waste (municipal waste),is used the category "renewable energy resources". It is a special type of resources. In a general understanding in international practice, renewable energy resources replace traditional (non-renewable) energy resources, they are capable of recovery in a short time in the scale of human life and are inexhaustible. R.W. Gorodov, V.E. Gubin, A.S. Matveyev note that renewable energy sources constantly exist or periodically arise energy flows(Gorodov, R.V., 2009).

The International Energy Agency, the 2009/28 / EC Framework Directive "On the promotion of the use of energy from renewable sources" describe a list of types of energy sources, such as sun, wind, tidal energy, including landfill gas, biogas. By the Law of the Republic of Belarus "On Renewable Energy Sources" biogas is also included in the list of such sources. In our opinion, the inclusion of biogas (garbage gas) in the composition of renewable sources is unambiguous.

If the formation of biogas in marshes is a natural renewable process, while the formation of biogas reserves at the burial sites directly depends on the volume of organic wastes input, their composition and the creation of optimal conditions for biogas(garbage gas) generation by humans. The energy resources generated in the body of the landfill during the wastes fermentation are a dependent variable.

Therefore, the term renewable energy sources (RES) is applied to those energy sources whose reserves are being replenished in a natural way and unlimited. We are inclined to the fact that methane formation is technogenic gas formation, the stocks of which directly depend on the volumes of organic wastes entering the landfill and their composition.

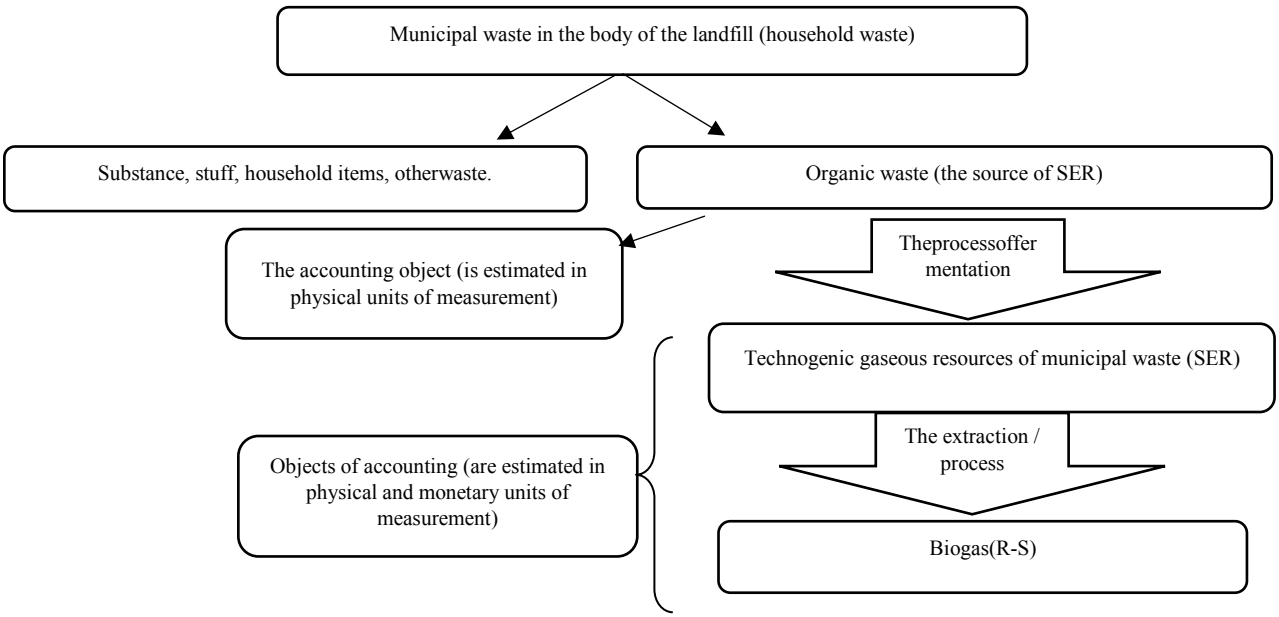
In the specialized literature, the concepts of "the alternative energy resource" and "renewable energy resource" are often equated. By their composition, alternative energy resources are identical to renewable ones. The same energy of the sun, wind, waste and so on. The key characteristic feature of this category of "alternative energy resources" is "which replace traditional energy sources". This concept originated on awareness of the need for humankind to solve environmental problems and the need to resort to non-traditional sources of energy.Thus, as part of our study, alternative technogenic gaseous resources are the energy-economic potential (methane reserves) generated by the decomposition of municipal waste in the body of the landfill (in special enzymes), under the influence of microorganisms, and the extraction of biogas onto the surface of the earth and its further use implies ecological and economic feasibility. Considering "technogenic gaseous (energy)resources of municipal wastes" as an asset, we believe that the recognition of this object as long-term stocks will be correct. The explanation for this is the non-simultaneous (unstable) emission of biogas in the body of the landfill for several years.

So, in accounting, the stocks of technogenic gaseous resources of municipal wastes are long-term assets that are a part of the mineral resources (established by the results of laboratory tests and expert evaluations).

In addition, to the study of the economic essence of municipal waste, as well as renewable sources of energy, we analyzed the ratio of such categories as "resource" and "raw-substance". According to the National Standard of the Russian Federation GOST R 54098-2010"Resource Saving", the concept of "resources" is primordial in relation to the secondary (specific) concept of "raw-stuff". From this explanation, the information on the following chain should be recorded in the account: communal wastes-secondary energy resource-secondary energy raw materials.

In our study, we will proceed from the assumption thatprocessed secondary energy resources (SER) are secondary raw-substances(R-S), which are the starting material for the subsequent production of heat or energy production. In this case, by "processing" we mean the extraction of biogas from the body of a landfill, its purification in special installations from unnecessary impurities.

Below we present schematically the formation of accounting objects



Source: author's construction based on the studied special literature

Fig. 2. Formation of accounting objects at the stages of municipal wastes conversion

The technogenic gaseous resource can act as an asset of the organization if it meets the criteria of the asset.

According to the concept of international financial reporting standards, the asset is a resource controlled by the organization as a result of past events, from which future economic benefits are expected to flow into the organization. So in the Republic of Belarus under the law "About accounting and report" assets are considered to be "property, appeared in organization as a result of performed economic operations and that causes receiving economic profit".

Thus, in the Republic of Belarus there are the following assets peculiarities: right of property for the object, so called right of use, disposition (right of ownership); the presence of economic profit.

According to the current legislation of the Republic of Belarus, a technogenic gaseous resource can not be included in the composition of assets, since the exclusive right to own the components of the natural environment belongs to the state. Consequently, the ownership of the technogenic energy resource (biogas), as a component of mineral resources, belongs to the state.

Reflecting values as balance assets for which there is a right of ownership, is the fundamental objective of static accounting.It's necessary to emphasize that the order of priority of content against form is included into "The main principles of preparation and presentation of financial reports": if the information should truly represent operations and other events, so it's necessary for this information to be taken into account in accordance with their content and economic essence and not only with legislative form". The principle of priority of content against form is fixed in Law "About accounting and report" of the republic of Belarus and other countries.

Absence in the balance of this indicator distorts information about the resource and economic potential of the organization. While the economic potential of a business entity reflects the ability to ensure its long-term functioning and the solution of its strategic tasks.

It is necessary to note that biogas as a part of minerals is national wealth of each country, however at this time in the Republic of Belarus, it is notconsidered the object of economy and it is not joined in calculating of national wealth of the country. National accounts do not record the consumption of biogas as an element of natural capital in the process of economic activity, and, accordingly, the natural capital contribution to the economic component of the state.Therefore,

the system of accounting does not provide necessary informational base for estimation of macroeconomic indicators of stable country development (net inner product, index of adapted net savings, “Green” GDP etc.)

In order to disclose information about the economic facts, that meets the interests of some consumers of financial statements, it is considered permissible to apply the dynamic theory of accounting to accept the technogenic gaseous resource of municipal waste as an asset.Thus, IFRS(IAS) accept the dynamic theory of accounting based on the principle of reflecting all used assets on the balance sheet irrespective of their ownership. The significance of reflecting all natural resources (both owned and not owned by an organization according to the property rights) on the balance sheet is noted in the works of such native and foreign scientists as Vegera S.G., Metla O.S. Shevlukov A.P., Altuhova Y.V., Shirobokov V.G.

Sub-part 2 Assessment and Accounting of Technogenic Gaseous Resource

Proceeding from the fact that the stocks of methane formation in the body of the landfill (which will be the added value of the organization) are of commercial interest, and the municipal wastes stocks are of ecological interest, the economic evaluation can be assigned only to the energy potential in the body of the landfill. In turn, municipal waste flows, their accumulation are subject to mandatory assessment in physical units for rational management and forecasting of the emission of gaseous resources in the body of the landfill.

As it was already noted, there are no data on the economic value of gas reserves in the accounting of organizations that extract biogas from the landfill body. The lack of such data leads to a decrease in the information content of the reporting and does not allow to assess the resource and economic potential. Accordingly, the investment attractiveness of the organization is missed, the possibility of receiving government subsidies is declining. The organizations reflect only the actual costs of forming and attracting an technogenic gaseous resource into economic activity, which are capitalized as part of fixed assets and intangible assets. This is the cost of acquiring a license for economic activity, the right to use the land and the cost of disposal facility, of equipment that monitor temperature and humidity in the body of the landfill, wells and pumps and other devices. At the same time, according to the legislation of the Republic of Belarus in the accounting of fixed assets and intangible assets and in IAS 16 these costs can subsequently be subject to revaluation at current market prices. As a result, the revaluation distorts the information on the costs of the formation of technogenicgaseous resource and its involvement in economic activity for the analysis of the effectiveness of the invested funds.

To address the issue in determining the type of assessment of a long-term asset as a technogenicgaseous resource, we analyzed the scientific works of J. Richar, Y.V. Sokolov, M.I. Kuter, M.L. Pyatov, N.M. Karzaeva, S.G. Vegera, O.S. Metla. Scientists are considering approaches to assessing long-term natural resources and are of the opinion that the choice of the type of assessment should be consistent with the goals set for the organization, and the idea of simultaneous application of static and dynamic balance concepts for accounting of long-term natural assets is currently extremely urgent (Vegera, S.G., MetlaO.S., 2015)

The idea of a static balancetheory is based in the calculation and reflection of data in financial statements about the organization's ability to pay off its debts. Thus, the valuation of assets at current market prices (fair value) is the principle of the static balance theory. The valuation at fair value provides for the analysis of the property position. Accordingly, the main users of reporting static theory are lenders. The idea of a dynamic theory is based on the reflection in the reporting of the effectiveness of the organization's activities, the calculation of financial results. Valuation of assets at historical cost is the principle of dynamic accounting theory. The owners of the company are interested in such accounting information. The combination of the two accounting theories within a single balance sheet is justified by the desired results- the reflection in accounting and financial reporting of data both on property status and on the effectiveness of the

business entity.Such an idea helps to fix actual costs by attracting natural resources to economic activity (according to the dynamic theory of balance), which provide a basis for analyzing the effectiveness of investments in the formation and attraction of resources. While accounting of natural resources at current market value (according to the static balance theory) will allow assessing the resource potential and investment attractiveness of the organization.

As a result of the study on the possibilities of applying parallel accounting for long-term natural resources, we proposed to account the technogenic gaseous resources as a long-term asset in two assessments: on the one hand, based on actual costs associated with investing in the formation and attraction of alternative technogenic energy resources in economic activity (costs of economic activity right and so on, the costs of acquiring devices to maintain temperature level in the body of the landfill, bioreactors, wells and pumps, etc.), on the other hand - at the fair value (current market value) of the methane stocks.

Reassessment of market value and depreciation of technogenic energy resources (methane reserves) should be carried out according to changes in current market prices, as well as according to changes in the volume of stocks in the body of the landfill, based on laboratory analysis and expert evaluation.

Recognizing technogenic gaseous resources as assets in the system of accounting and financial reporting, information about methane stocks is proposed to be reflected on the subaccount *XX.X "technogenic gaseous (energy) resources"*, opened to synthetic account *XX "Mineral Resources"*

It should be noted, that the system of mineral resources accounting should reflect not only information about biogas stocks, but also include information on its consumption. Consumption should be considered as extraction of biogas from the landfill body, which leads to a reduction in biogas stocks. Therefore, it is proposed to register information about consumption on a separate passive subaccount *XX.X "Consumption of technogenic gaseous resources"* of account *XX "Depletion (consumption) of mineral resources"*.

Speaking of biogas (garbage gas) as an element of technogenic natural capital, we recall the existing need for accounting of natural capital in the 21st century when assessing economic growth. The contribution of natural capital to economic development, the need to take it into account in calculating the indicators of level and quality of life, welfare, national wealth were were investigated in works of: R. Konstanza, H. Daley, Brendar Fisher, Kerry Tyurner, Bazylev N.I., Bobylev S. N. and of many other scientists, as well as the study of the contribution of natural capital are paying attention representatives of the collective co-authorship of public and international organizations of the «Big eight» countries, preparing reports on the economics of ecosystems and biodiversity (The Economics of Ecosystems and Biodiversity-TEEB).In order to create an interrelated system of indicators of natural assets and indicators of the traditional system of national accounts, the UN Statistical Commission in 2012 publishes an international standard for environmental and economic accounting (SEEA). The SEEA framework follows a similar accounting structure as the System of National Accounts (SNA) and uses concepts, definitions and classifications consistent with the SNA in order to facilitate the integration of environmental and economic statistics.

As for the bookkeeping of natural assets, we have analyzed the scientific works of Shevlyukov A.P., Altukhova Y.V., Shirobokov V.G., J. Richar, Vegera S.G., Metla O.S. The recognition of a natural resource by an organization's assets presupposes the existence of a balancing item in the passive side of the balance sheet. Shevlyukov A.P., Altukhova Y.V., Shirobokov V.G. consider "natural capital" as a source of formation of land plots and natural resources of state property.

Considering the accounting problem of the sources of land plots on which the organization has no rights of ownership,Vegera S.G. suggests in the passive side of the balance sheet as the source of such asset to consider "the attracted natural capital" and reflect it on the separate account (Vegera S.G, 2011).

Paying attention to the fact that the objects of burial are exploited in the process of landfill functioning and of biogas extraction on lease / temporary use of ecosystem objects, we share the scientific justification of Vegera S.G. in the part

of reflecting in the balance sheet as a source of formation of natural resources not of natural capital as such, but of *attracted natural capital.*

The cost of forming methane stocks in the activities of economic entities is suggested to be capitalized on the accounts "Investments in long-term assets", "Fixed assets" or "Intangible assets". So the costs for the formation of technogenic gaseous (energy) resources will include the cost of those facilities that are directly involved in the process of methane generation, namely: the right to use land plots (burial objects), devices for maintaining the optimum temperature level in the body of the landfill, drainage systems and other devices. In the balance sheet, the source of assets at the actual cost of forming and attracting mineral resources will be either own capital or liabilities.

Once again, we should note the need to take into account in physical and qualitative units the flows to the landfill and their accumulation, since the key integration area is the relationship between the indicators of municipal waste, the biogas extraction indicators and the potential emissions of greenhouse gases into the atmospheric air.

Studying the methane formation in the landfill not only from the standpoint of the economic potential of the organization and the state, but also from the point of view of the requirements for reducing greenhouse gas emissions into the atmosphere, it is necessary to note about the trading system of quotas for emissions that exists in the international practice. A similar market mechanism was developed by international climate change programs and the Kyoto Protocol in order to create the most effective methods for reducing emissions by States.The mechanism assumes that countries receive quotas on carbon dioxide emissions, which they can dispose of at their discretion: to use for their own production purposes, to sell, to buy, and to exchange for other assets. Thus, the accumulation of quotas (permits) stocks for greenhouse gas emissions becomes an asset for the organization carries out the bury of waste and the biogas extraction. Such quotas (permits) stocks can be sold with the aim of obtaining additional income.

Thus, the ecological effect of biogas extraction is simultaneously accompanied by an economic effect of the state. However, consideration of the emission quotas stocks as an accounting object requires a deep scientific understanding, taking into account the requirements of modern market mechanisms for climate regulating and of course corresponding additional studies are required.

Conclusions, Proposals, Recommendations

In order to solve environmental problems, ensure sustainable development of nature management and energy efficiency, there is a need to develop accounting of biogas stocks as an energy (economic) potential, the source of accumulation of which are organic municipal wastes.

Based on the highlighted goal and tasks of the research, the following final clauses can be singled out:

1. The study scientifically justified the recognition of a new accounting object of the «technogenic gaseous (energy) recourse of municipal wastes», which is a long-term asset in the form of stocks of mineral substances in the landfill body, and which has economic potential.
2. To keep accounting of the studied object is offered in two aspects:

2.1 accounting at actual costs (historical cost) for the generation of technogenic gaseous (energy) resource of municipal wastes and its attraction to economic activity. We propose to capitalize the costs of forming and attracting technogenic gaseous (energy) resources, which will be included in fixed assets or intangible assets. Through the process of calculating depreciation, these costs will fall into the composition of the costs of the main activity of the organization (extraction of biogas). According to the dynamic theory of balance, the reflection of biogas stocks at actual costs for their formation and involvement in economic activity will provide a basis for analysis of efficiency of investments in technogenic natural resources.

2.2 accounting at fair value (current market value) of biogas stocks. According to the staticbalance theory, biogas stocks accounting at the current market value will allow estimating the resource potential and investment attractiveness of the organization. The process of consumption of technogenic gaseous resources in accounting will reduce the value of technogenic natural resource.

3. In the balance sheet as a source of formation of the investigated long-term asset in the valuation at historical cost is the company's own capital or liabilities. The source of the economic resource (potential) in the market value assessment is the attracted natural capital.

The proposed accounting model will provide an opportunity for further assessing the contribution of natural capital to the development of the business entity and the state as a whole. It will provide the necessary information base for calculating macroeconomic indicators of the country's sustainable development, characterizing human progress taking into account the natural factor.

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EXPLORING THE CONCEPT OF CONNECTED SERVICE INNOVATION

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Abstract. The more an economy is developed or the faster it is growing the more it depends on innovation in services for their future growth. In consequence, the successful introduction of new services is becoming increasingly important as a key driver for economic growth and profitability of large manufacturing firms, such as car manufacturers. This paper is concerned with the contribution of service innovation to customer loyalty. It uses the automotive aftersales business as an example to evaluate if the introduction of innovation such as connected services creates loyalty. In this paper customer loyalty is regarded as future repurchase intentions of existing customers. The goal of this academic contribution is developing a three-step model for measuring the contribution of Connected Service Innovation (CSI) towards loyalty. The approach is based first on literature review on service innovation and customer loyalty. In the seconds step a conceptualization of CSI is conducted. Based on the results of the conceptualization and on existing literature on customer loyalty a model of effects can be derived to empirically measure the effect of CSI towards customer loyalty. The aim of this paper is the explorative conceptualization of CSI in the framework of automotive aftersales business. The result is based on interviews with automotive experts with the target to identify key attributes of CSI. Next, the identified attributes are further analysed within the scope of a qualitative, written survey with active customers of CSI using the method of means-end analysis. Based on these results the concept of CSI is designed. Results will help car manufacturers and their dealer-networks to fine tune their approach of Connected Services and to improve the service offering. Reliability of the findings will be considered after empirical testing the derived model in the near future.

Key words: *Customer benefit, customer loyalty, service innovation, trust*

JEL code: M31, O33

Introduction

After years of focusing on cost reduction and optimization of process flows, the creation of service innovation comes into focus because the purpose is to provide additional services to the market and therefore to increase market share and profitability for the vendor. In saturated markets like Germany, competition becomes more and more intense since globalization leads to increased price sensitivity among customers. Companies as well as economists consider service innovation as a lever to new sources of profit as well as new possibilities to keep their customers loyal. The above-mentioned intensification of the competitive pressure affects not only large companies like vehicle manufacturers, it also affects small and medium size companies, such as car dealers and car service providers. (Herstatt et al. 2007, p. 1; Hipp et al. 2000) In consequence of this trend, the need for service innovation to fuel further economic growth and to raise the quality and productivity levels of services has never been greater. Services are moving into focus especially for companies of the old economy, such as car manufacturers. One challenge to systematic service innovation is to combine technology, business, social, and customer needs in the creation process of service innovation. (Spohrer, Maglio 2008, p. 238) However, there is little research and knowledge on developing and designing services. Service innovation helps traditional product innovation oriented companies like manufacturing firms to fulfil actual and future customer needs. The satisfaction of customer needs is based on the concept of value creation for customers within the service delivery process. While customers are more and more competent in articulating their needs, and expressing their demands, the success of

service innovation becomes more and more dependent on the use and integration of information technology and digitization of information processes into the service delivery system. (Bouwman et al. 2008, p. 3) This field of innovation has a high relevance in the automotive industry with its focus on car to car communication. Systems such as live traffic information or emergency-call are based on the context based adaption of services and processes at the interfaces between customer, vendor, brand and vehicle. The acceptance of a new service is one of most important aspects regarding success. The more knowledge about customer needs is collected within the firm´s innovation process, the better these needs can be used to design the service. This research aims to investigate the impact of service innovation on customer behavioural intentions in terms of loyalty. The aim of this paper is to define and to explore the concept of CSI. Based on the results, the dimensions of CSI are identified. These findings provide necessary insights for researchers and industry to design and improve future service innovation offerings.

Foundation on Service innovation

In the first step, it is necessary to define the terms service, innovation and service innovation. According to Grönroos (1990), services are "an activity or series of activities of more or less intangible nature that normally, but not necessarily, take place in interactions between the customer and service employees, and/or physical resources or goods and/or systems of the service provider, which are provided as solutions to customer problems." Adding, Kotler and Bloom (1984) state that: "a service is any act or performance that one party can offer to another that is essentially intangible and does not result in the ownership of anything. Its production may or may not be tied to a physical product." The fact that services not necessarily are tied to a physical product leads to the conclusion that the transition between products and services is more of a gradual nature and sometimes cannot always be differentiated unequivocally. (Jong et al. 2003, p. 14) Grönroos (1990) emphasizes four basis characteristics in defining services: (1) Intangibility. The use of services does not result in ownership like in the case of physical products. The customer purchases the right to receive a service. Services are non-physical, although it is provided in support of a tangible product. (2) Inseparability. Production and consumption are conducted at the same time. In contrast to physical products, services cannot be stored. Some or all parts of the service process depend on the interaction between provider and customer, and the information the customer provides. Most of the time customers are present while the service is produced or their presence is mediated by channels like the Internet, e-mail or mobile media. (3) Heterogeneity. Service outcomes and processes are not standardized. Quality control is hard to obtain in comparison to the efforts performed to ensure the quality of physical products. Because of this, services can vary in quality. The evaluation of the quality of a service, in terms of outcome and process, de-pends on the customer's individual and subjective expectations and perceptions during the consumption of the service. (4) Perishability. The service cannot be transferred or resold which means that the resources needed to deliver the service are not wasted, but must be made operational to deliver the service again. (Grönroos 1990; Kotler, Bloom 1984) An indispensable characteristic of service is the necessity of the integration of an external factor (e.g. customer) into the process of service delivery which consists in the introduction of a service object by the consumer into the into the creation and delivery process of the service. (Hilke et al. 1989, p. 12) Possible manifestations of the external factor may be human beings as well as material objects such as vehicles or immaterial objects such as software. A disadvantage of the intangibility of services is that there are less possibilities to secure innovations by patents and copyrights. In distinction towards products the imitation of services by competitors is easier. (Oke 2004, p. 39) This may lead to a shortened time of competitive advantage for companies introducing innovations based on services.

The literature review on Service innovation has shown that there exist several approaches in the scientific community towards the definition of Service innovation. Approaches exist that either come from a company´s perspective (Johne, Storey 1998) or from a customer´s perspective. (Barcet 2010; den Hertog et al. 2010) In this research the focus is set on

the customer perception of innovation. Thus, the customer oriented definitions of service innovation are considered in detail. Centering the effect of SI on customers, Barcet (2010, p. 51) states that a service innovation: „introduces something new into the way of life, organization, timing and placement of what can generally be described as the individual and collective processes that relate to consumers." The novelty of a service innovation can consist of a new service, a new service portfolio and/or a new service process that individually or in combination defines a new way of creating value for the customer. (den Hertog et al. 2010, p. 494) Further, the authors concretely categorize possible dimensions and describe service innovation as "a new service experience or service solution that consists of one or several of the following dimensions: new service concept, new customer interaction, new value system/business partners, new revenue model, new organizational or technological service delivery system." This definition covers important aspects within the scope of CSI. CSI is a new service concept, it introduces a new way of customer interaction as well as new business partners, revenue models and technology based delivery system. Therefore, the definition of den Hertog et al. (2010) shall be the foundation for the further process of this research. Another important aspect of Service Innovation is described by Toivonen, Tuominen (2009, p. 893), who combine the mutual dependency of benefit creation. The authors state that „A service innovation […] provides benefit to the organization that has developed it; the benefit usually derives from the added value that the renewal provides the customers." Inferentially, an important target of the introduction of service innovation is the value creation for the customer.

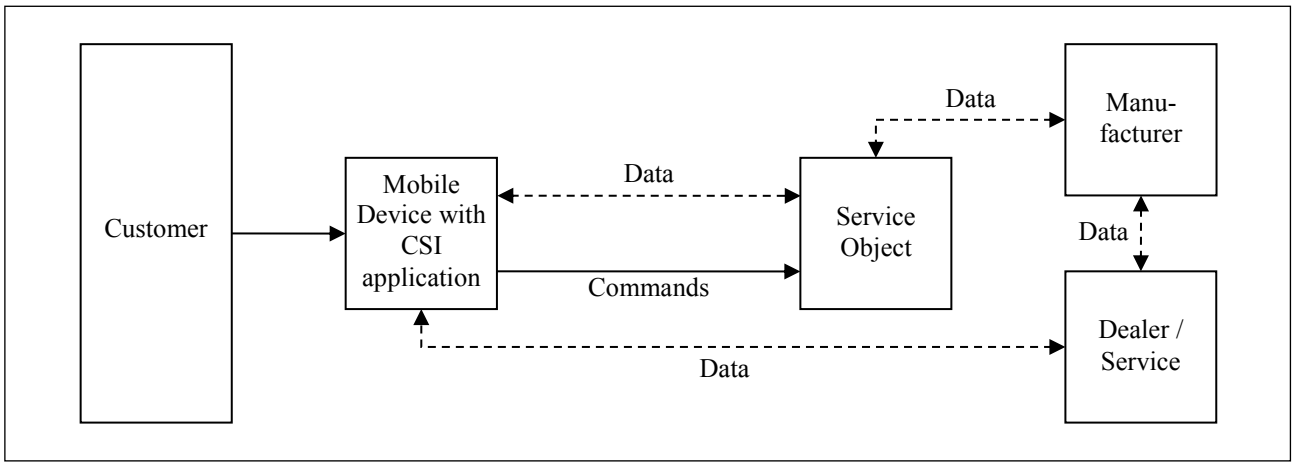
Definition of Connected Service Innovation within the framework of Remote Services

In the next step the definition of service innovations needs to be assigned to the context of Remote Services as sub-discipline of Mobile Services as the technological framework of this research. Based on the definition of Järvelä et al. (2001), Karhu (2007, p. 26) defines mobile services in the following way: "Mobile services are independent of time and place. Mobile services can be consumed via a mobile device over a public network and they involve interaction between the customer and service provider's systems". Integrating the aspect of innovation, mobile service innovations combine technologies and concepts from the area of telecommunication, information technology and consumer electronics and typically require cooperation in complex value networks between suppliers, vendors and customers. (Bouwman, Fielt 2008, p. 4) Picking up the idea of Kotler (2002), mobile services can supplement traditional, physical products. These services aim to provide added value to the customers that is particularly based on the usage of mobile devices, such as smartphones to achieve competitive advantage.

As a subset of mobile services, recently remote services as an additional type of services has developed, describing a separate kind of service that can be delimited from traditional services because a technological interdependence occurs within the delivery process of the service. Wünderlich et al. (2007, p. 7) define remote services as "services that are delivered through a technologically mediated process between a service provider and its customer regardless of the spatial distance. The spatially separated service object can be bidirectional controlled and modified via a control unit." Remote services can be subdivided into Remote Monitoring, Remote Diagnostic and Remote Control. (VDMA 2006, p. 7)

The derived definition of service innovation in conjunction with the definitions of mobile services and remote services are the foundation for the definition of "Connected Service Innovation" as a proposal for an integrated approach. Therefore, based on the idea of Connected Services by Hiraoka (2009, p. 16), the following definition for the term *"Connected Service Innovation"* is suggested by the author of this paper: *"Connected Service Innovation is – in terms of the customer – an innovative mobile remote service that enables customers to interact with the service object as well as the service provider by using mobile infrastructure independently of the spatial distance. This infrastructure enables the bidirectional exchange of information and the control of the service object via data channels."* CSI requires several

control elements. Information and communication technology (ICT) enables the service provider to access the service object as well as the customer's mobile device. The customer needs access to ICT that makes it possible to query data and to control and modify the service object. The service object must be able to feed the system via ICT with data of its own status. This enables the customer and the service provider to access the service-object in order to monitor, to perform diagnostics and to control it. (Wünderlich et al. 2007, p. 13) Figure 1 describes the information and communication flows within the system architecture.

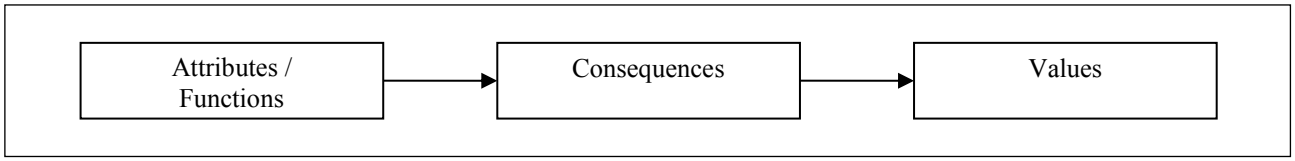


Source: author's construction, extended from Wünderlich et al. (2007, p. 13)

Figure 1: **Schematic system-architecture overview of CSI**

Research methodology and results

The qualitative investigation serves the exploration of relevant dimensions of CSI and its content facets from the customer's view. As a suitable analysis method, a customer survey was selected using the concept of means-end chain analysis. Transferred to the context of this work, the basic idea of the means-end approach is that a customer decides to use a product or service to achieve certain wishes or targets. In consequence, the mechanism of a means-end-chain makes it possible to track back perceived consequences towards certain attributes or functions of a product or service. Figure 2 shows the concept of a means-end-chain. (Gutman 1982, p 60-62)



Source: Gutman 1982, p. 60

Figure 2: **Concept of Means End Chain**

To carry out the survey, it is necessary to select functions of CSI to be examined in terms of attributes and to determine a suitable sample. For the selection of attributes, the field of investigation was initially limited to four German car brands. The means-end chain analysis is carried out for 10 CSI-specific functions, which are listed in Table 1. The description of the functions is based on existing customer literature on connected services in the automotive industry. Additionally, expert interviews were conducted with employees from design departments of car manufacturers as well as sales and aftersales experts within the authorized dealer network to identify the most important functions from the experts'

perspective. From the expert interviews, also the requirement emerged that the selected functions cover as much as possible a spectrum along the range of the functionality of CSI. According to the categorization of VDMA (2006, p. 7), the selected functions in Table 1 can be assigned to the categories Remote Monitoring (1, 2, 10), Remote Diagnostic (3, 4, 6, 7, 8) and Remote Control (5, 9).

Table 1

Functions of Connected Service Innovation

No.	Function	Description of the functions/attributes of CSI
1.	Vehicle Status	Query of important vehicle condition data such as tire pressure, wiper water level, brake wear, tank level, battery status or the necessity of a service.
2.	Vehicle Localization	Indicates the last vehicle position for quick locating of the vehicle or for monitoring vehicle movements.
3.	Breakdown call	Connects with a manufacturer's call center agent and forwards the current location and vehicle data to the call center.
4.	Emergency call	In emergency situations, it automatically enables a voice connection with the emergency call center and transmits relevant data such as location.
5.	Remote air conditioning	Activation and deactivation of the heater by app for pre-air conditioning of the vehicle.
6.	Tele diagnosis	Informs you early about warning messages, e.g. Low battery voltage and transmits the vehicle condition data to your workshop.
7.	Concierge Service	The call center helps you with the selection of your destinations, e.g. a restaurant. The address will be sent directly to your navigation system.
8.	Service Appointment	Informs you about an upcoming service and initiates the automated appointment with your preferred workshop.
9.	Locking and unlocking	Indicates whether the doors are locked and allows unlocking and locking the doors via the app application without using the key.
10.	Online Theft alarm	Informs you about the activation of your theft alarm system on your smartphone and by email. Alarm messages are logged and archived.

Source: author's results based on literature review and expert interviews

The survey was conducted during the period of April and May 2017 in Germany. The participants are customers of four car dealers and four different brands. They were addressed while waiting at the service counter or in the waiting lounge. As a prerequisite, the participants should have owned and used a version of CSI in the past 6 months. The participants are also referred to as users of CSI. The sample size for the written surveys in person consists of 18 participants. 83% of participants were between 35 and 54 years old, 72% were male, 28% female. This relation is analogical to existing research on customer behavior in the automotive trade industry. (Scholly 2012, p. 181) 61% of participants state that they use CSI regularly or often. 39% percent use CSI seldom. None-users are not enclosed in the survey. The sample used does not claim to be representative of the customer structure of automotive brands. For this qualitative investigation, precisely to explore the manifold aspects of CSI, the representativeness is only of secondary importance. According to (Lincoln, Guba 1985), the analysis of theoretical saturation of this qualitative analysis shows that the last 6 surveys, which represent 30% of the sample, show no additional contribution regarding new categories on the coded level. Thus, it can be assumed that a larger sample size would not provide additional findings and the identified results are sufficiently meaningful.

The survey was conducted using the „hard"-laddering technique. In contrast to "soft"-laddering, this type of laddering uses self-filling written surveys, which can be seen favorable in the context of this approach, because the attributes are preselected and provided to the customers within the survey document. Following Russel et al. (2004, p 582) especially in case of predefined elements, the hard-laddering approach is considered as appropriate method. Another advantage is

the avoidance of an interview bias as well as the avoidance of the tendency of customers not to allow insights into their personal values. (Balderjahn, Will 1998, p. 68) Within the content analysis the mentions are categorized according to the Gutman (1982) method. In the process, systematic queries are used to investigate the consequences and the advantages of the respective functions of CSI which are relevant to the customer. Within the next step of coding, based on certain and recurring key words, a summary of the consequences and the values of CSI is then drawn. For example, the quotations „I feel comfortable“ and “It increases my comfort” have been assigned to the group „Comfort“. This procedure was applied in cases one can presume the single quotes mean the same. (Böcker et al. 2005, p. 9.) The numbers in brackets describe the frequency value of mentions after coding. The results of the content analysis are shown in Table 2.

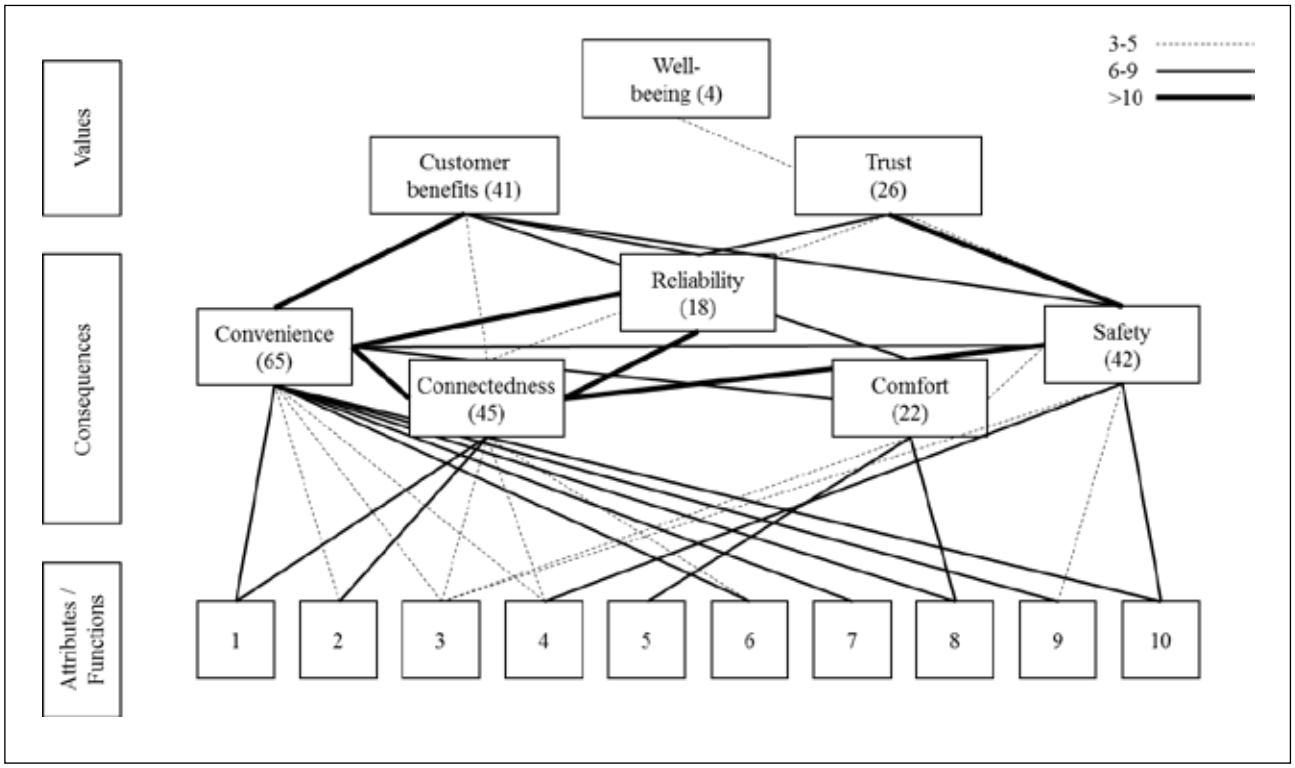
Table 2

Content analysis of means end chains and count of mentions in each category

Attributes	Consequences	Values
Vehicle Status (15)	Convenience (81)	Perceived benefit (42)
Vehicle Localization (16)	Connectedness (52)	Trust (25)
Breakdown call (17)	Safety (48)	Well-being (5)
Emergency call (17)	Reliability (32)	Satisfaction (2)
Remote air conditioning (15)	Comfort (31)	
Tele diagnosis (15)	Mobility (4)	
Concierge Service (14)	Service Quality (3)	
Service Appointment (15)	Enjoyment (2)	
Locking and unlocking (15)	Competence (1)	
Online Theft alarm (15)		

Source: author’s results based on survey results

The identified frequency values form the basis for the development of the Hierarchical Value Map (HVM). It graphically depicts the most important relationships between the individual elements of the means-end chain in the form of a tree-like, hierarchical structure. In terms of clarity a so-called cut-off level is defined. It determines the frequency at which an association must at least be mentioned before it is applied in the HVM (usually between 3 and 5). In this analysis, the cut-off level is set to 3 connections to reduce complexity and to fade out irrelevant paths. Applying this cut-off level, 81.7% of all connections are represented in the HVM fulfilling the requirement of Gengler, Reynolds (1995, p. 25), who state that the minimum threshold value shall not be lower 70%, recommending a level between 75-85%. For the same reason in the HVM only direct relationships are displayed. The numbers in brackets describe the count of connections, which in consequence is an indicator for the importance of a dimension on the consequence- and value-level. The visualization of the Hierarchical Value Map is shown in Figure 3.



Source: author's results based on empirical analysis

Figure 3: **Hierarchical Value Map**

Based on the results of the means end analysis the following main consequences were identified: Convenience, Connectedness, Safety, Comfort and Reliability. The consequences Convenience, Connectedness and Safety show the highest numbers of connections and thus substantially determine the construct of Connected Service Innovation. The consequences Comfort and Reliability show lower levels of connections but still on a significant level and thus also are considered as dimensions for the further process of research. The identified consequences Mobility, Service-Quality and Enjoyment are not considered in the HVM since the requirement of the cut-off level is not fulfilled. In consequence, these aspects considered to be not relevant for the concept of CSI. On the value level three elements were identified with Customer benefits, Trust and Well-being. Especially the factors Customer benefits and Trust show strong connections, whereas Well-being just fulfills the cut-off level and only shows connections towards Safety. In consequence, focus is set on the factors Customer benefit and Trust. The terminal value Well-being is neglected in the further process of research.

Conclusions

1. The definition of Connected Service Innovation developed by the author of this paper captures the particularity and novelty of this new type of service, emphasizing the simultaneous interaction of customers with the service object as well as the service provider by using mobile infrastructure independently of the spatial distance.
2. The qualitative study underlines the assumption that Connected Service Innovation is a multidimensional construct consisting of the dimensions Convenience, Connectedness, Comfort, Safety and Reliability.
3. The HVM shows that two different main factors can be distinguished on the value level. For most of the users of CSI the creation of customer benefits is important. Especially the dimensions Convenience, Comfort, Safety and Reliability lead directly customer's perception of benefits provided by CSI. Connectedness leads to Customer

benefits indirectly via the creation of Convenience. The second terminal value which was identified by this study is Trust. Especially the dimensions Safety and Reliability show a high number of interrelations towards Trust.

4. The identified dimension of perceived Connectedness captures the particularity of CSI, which goes beyond the previous understanding of existing research within the field of service innovation. Within this dimension the aspect of simultaneous connectivity towards a service object and a vendor is conceptualized.
5. Customer Benefit and Trust are antecedents towards customer loyalty. Thus, the identified factors are potential mediating constructs between CSI and Customer loyalty. According, CSI are a driver for customer loyalty, if it provides benefits and creates trust to customers.

In summary, the described qualitative, explorative approach leads to an identification of relevant dimensions of Connected Service Innovation. The identified dimensions show an overlap to findings in existing literature, especially in the field of technology acceptance. The central concern of this paper was the identification of suitable dimensions of CSI. Regarding the lack of existing research on CSI the derived results show a high degree of concretization. These results are an important contribution for the development of an impact model between CSI and Customer Loyalty.

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DOES FAMILY BUSINESS HAVE PECULIAR FINANCING POLICY? EVIDENCE FROM LISTED COMPANIES IN CENTRAL AND EASTERN EUROPE

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Abstract. The article describes characteristics of listed companies financing policies, with particular emphasis on family businesses. The aim of the article is to find statistically significant differences in financing policy between family owned companies and others. As many as 4,539 listed companies in selected Central and Eastern European countries were analyzed in period of 2007-2016, including more than 603 family ones. The analysis was focused on capital structure, profitability and liquidity. Besides descriptive statistics the significance difference test were used. The research was conducted in a general, sectoral and national context. Results show that family businesses compared to other companies apply conservative financing policies. They are less indebted and generally achieve higher profitability. It must be stressed, however, that results obtained are not entirely clear. This may be caused both by the sectoral conditions of financing strategy and the differences in the family business development stage in particular country. Our findings do not allow concluding about the role of liquidity in the financial policy at the general level, but only at national one. The obtained results contribute to the research on the capital structure determinants and provide new insights about the family businesses behaviour. Some information about the role of centralized ownership in business management was provided as well. The results are mostly consistent with previous achievements, but they point some significant differences in the level of borrowing ability or financial liquidity in each country.

Key words: *family business, financing policy, Central and Eastern Europe, comparison, ownership*

JEL code: G32, G34

Introduction

Reasons determining decisions on the funding structure have been investigated for decades. Despite many important achievements we still are not able to clearly explain all the premises of managers' behaviour. This is caused by the presence of human factor in the economic calculation which cannot be precisely quantified. Examples can be found in studies on family businesses behaviour and their financing decisions. These companies take care of the good of the family, which may sometimes be contrary to the interests of the company. Maintaining a family character of business requires maintaining the control over capital ownership, therefore it forces out using internal sources of capital. Debt collection raises the risk of bankruptcy and being controlled by lenders. On the other hand, external equity financing leads to the risk of taking control over the company by non-family members. Financing based solely on own, internal sources of capital significantly reduces the growth of the company. Therefore family business managers are torn by an important dilemma, which makes them choose between the need of maintaining control and family business development.

The issue of family business financing was the subject of interest to many researchers. According to M. Jensen and W. Meckling, companies with highly concentrated ownership structures avoid debt as a source of financing (Jensen M., Meckling W., 1976). This is a consequence of the reluctance to monitoring all activities of the company by lenders and, in an extreme situation, losing control over the company. In this type of company for the safety of retaining full control over the business more expensive equity is preferred. Numerous studies show that family businesses take a very

conservative financial strategy, preferring to use internal resources to finance their operations (Gallo M.A., Vilaseca A., 1996; McConaughy D., Phillips G., 1999; Poutziouris P., 2001, Ampenberger et al., 2013). They prefer lower level of debt, high concentration of capital in family hands and static ownership structure that enables to keep control over the company. In addition, it was observed that family businesses' "specific financial logic" derives from managers' preference, who are usually family members, about the company's growth rate, risk, and its retention (Gallo M.A., Tapies J., Cappuyns K., 2004). The research confirms that family businesses, compared to their non-family counterparts, are more dependent on internally generated funds (Poutziouris P., 2001). Moreover, they appear to be uninterested in listing the company on the stock exchange because of the threat of losing control of the company (Keasy K., et al., 2015). This may cause debt financing choice instead of issuing equity. Many researchers point out that financial decisions of family businesses are very well explained by the pecking order theory (Romano C.A., et al., 2001; Basly S., 2007; Koropp C., et al., 2013). This means that they tend to use their internal capital first then debt and, finally, external equity (Myers S.C., Majluf N.S., 1984). Therefore financial policy and degree of indebtedness are determined by actual stage of company's development. This would mean no difference in financing of family businesses and others.

The study of Japanese family and non-family businesses (comparison of 1998 and 2003) has shown that family businesses are more effective in terms of ROA, ROE, ROIC than non-family businesses and family-owned businesses are less indebted (Allouche J., et al., 2008). The study of Spanish companies allows noticing opposite level of debt (Acedo-Ramírez, M. A., et al., 2017). Those companies were more likely to use debt than non-family ones. The propensity for borrowing was, however, different and depended on the size and maturity of family business. Larger and more mature companies were more indebted which partly confirms the pecking order theory. In turn, the analysis of German family firms' decisions has shown that they are ready to bear higher costs of financing if they remain free in business decisions making and financially independent (Peters B., Westerheide P., 2011).

Relatively little research is devoted to family entrepreneurship in emerging markets. Research on the financing strategies of Polish family businesses has shown that most companies financed their activities solely with own resources, while the remaining few used bank loans (Winnicka-Popczyk A., 2008). Companies covered by the survey motivated their reluctance to use credit with high and volatile interest rates and fear of difficulties with the loan repayment. Low level of debt in Polish family business few years later was also confirmed in the study on their corporate governance (B. Socha, 2015). Polish family companies have also appeared to be more profitable than non-family ones (Martyniuk, O., 2016). Interestingly, profitability does not have to be the main goal of the activity (Csákné F.J., Karmazin G., 2016). The study of Hungarian family firms indicates that often the need to provide employment for family members and keep property under the control of the family may be equally valid purposes. This has obvious consequences in financing strategy that will be more conservative not to expose family assets to be impaired. In turn, the analysis of the Russian market allows to point out that Russian family firms tend to maintain greater independence through higher liquidity (Buccellato, T., et al., 2013). Czech companies are characterized by a very cautious financing policy (Machek, O., Hnilica, J., 2015). They are more profitable than non-family companies (ROA), they are able to keep better margin and they maintain higher liquidity while the level of debt is low.

A relatively coherent but diversified picture of family finance policy emerges from the surveys reviewed so far. On one hand, they try to limit the influence of external shareholders, which leads them to get more indebted. On the other hand, they try to limit the indebtedness not to expose family assets to any major threat. The research results, however not clear, more often indicate lower leverage. Interestingly, studies carried out so far devoted relatively little attention to the issue of liquidity in financial strategy. It seems to be an important determinant of capital structure in terms of volatile profitability. Over-liquidity may, for example, lead to increase of indebtedness, especially in the context of tax

optimization (López, Sánchez, 2007). In the face of these doubts and radically different outcomes of previous studies a question arises whether family firms use a different funding policy and under what conditions it is implemented.

The purpose of this article is to identify differences in the policy of family business financing in the context of their liquidity and profitability as the basic determinants of capital structure. In addition, the study will be carried out on Central and Eastern European companies that have been rarely analyzed in literature so far. This will contribute not only to the development of family entrepreneurship research but also to emerging markets issues. The nature of funding policy can be affected by features of the sector in which company operates. For this reason, the analysis has been extended to include the type of activity conducted. This approach, especially in the international context, is very rarely discussed in literature.

Research Results And Discussion

1. Sample Description And Methodology

To determine the impact of family assets on business financing policy a statistic survey on a group of listed companies in Central and Eastern European countries was conducted. The sample consisted of all companies that were listed on their national stock exchanges over the years 2007-2016 and published annual reports for whole that period registered in the Amadeus database. A total of 4,539 enterprises were selected for the survey, in which 603 companies were identified as family ones. The classification criterion for a family business was based on its ownership characteristics given by Amadeus. An enterprise was considered to be a family company if the direct ownership of shares held by a natural person or a family was greater than 50%. The study used companies sufficiently representative, so with complete financial data set over the years 2007-2016, for their countries of origin in the Amadeus database. For this reason, Czech, Slovak, Slovenian, Belarussian companies and those from the Baltic States were not included. Number of available representative companies from those countries in the Amadeus database was usually lower than 50. For this reason they were considered as non-representative for their economies of origin. Consequently, companies from Bosnia and Herzegovina, Bulgaria, Croatia, Hungary, Moldova, Poland, Romania, the Russian Federation, Serbia and Ukraine were included in the study. Besides the national criterion, type of business activity was also taken into consideration. Then, the companies omitted in the national study were also analysed. Using the NACE Rev. 2 classification the following types of activities were identified: manufacturing (including categories A-E), construction and real estate (F, L), wholesale and retail trade (G), and services (H-J, M-S). Because of the financial sector (banks, insurance, investment funds) specifics associated with different financial reporting standards, it was excluded from the study as a whole.

Fundamental financial ratios related to capital structure, profitability and liquidity were used to describe financial policy characteristics. The study was based on the analysis of the following variables:

- gearing – defining the structure of debt [(noncurrent liabilities +loans)/shareholder funds],
- interest cover – specifying the risk associated with the debt (operating profit/interest paid),
- profit margin – describing profitability of conducted business activity (profit before tax/operating revenues),
- ROE – indicating return on equity (profit before tax/ shareholder funds),
- ROA – indicating return on total capital (profit before tax/total assets),
- current ratio – determining the level of overall financial liquidity (current assets/current liabilities),
- liquidity ratio – defining the level of quick financial liquidity [(current assets – inventory)/current liabilities].

Mutual relationships between liquidity, profitability and capital structure determine the nature of financial policy. Then, it is possible to distinguish a conservative policy characterized by low gearing, high liquidity when the profitability

is high. At the other extreme there is an aggressive policy characterized by the opposite configuration of gearing and financial liquidity. However, it should be noted that the level of profitability is a decisive factor. When the profitability is absent the level of gearing and financial liquidity may be the consequence of difficulties in access to capital rather than independent management decision. In order to avoid difficulties in comparing profitability between companies in different countries, before tax profit was used in the calculation.

To assess differences between financing policy pursued by family and non-family businesses we used statistical analysis and significance test for differences. We used the t-test for independent samples and Mann-Whitney's test. The t-test for independent samples was applied to assess the significance of differences between the expected value of quantitative variable in two independent populations. The null hypothesis is: H_0: $\mu_1 = \mu_2$ against the alternative hypothesis H_1: $\mu_1 \neq \mu_2$. The test is verified with the t-statistics of the following formula (Starzyńska W, 2007):

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{n_1 S_1^2 + n_2 S_2^2}{n_1 + n_2 - 2} \cdot \left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}, \quad (1)$$

where: $\bar{x}_1$, $\bar{x}_2$- arithmetic mean of the dependent variable for the population of family and non-family companies, S_1^2, S_2^2 – variance of the dependent variable for the population of family and non-family companies. The statistics represents Student's t-test distribution with the following number of the degrees of freedom $df = n_1 + n_2 - 1$.

Where the assumption on the homogeneity of the variance was not satisfied, we used a stronger version of the t-test (resilient to non-homogenous variances), with the test statistic taking the form of (Ruszkiewicz M, 2011):

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{S_1^2}{n_1 - 1} + \frac{S_2^2}{n_2 - 1}}}, \quad (2)$$

The statistics is of Student's-t distribution with the number of the degrees of freedom:

$$df = \frac{\left(\frac{S_1^2}{n_1 - 1} + \frac{S_2^2}{n_2 - 1}\right)^2}{\frac{S_1^4}{(n_1 - 1)^3} + \frac{S_2^4}{(n_2 - 1)^3}}. \quad (3)$$

Differences between populations, i.e. between the expected values of the dependent variable in compared populations were considered statistically significant if the probability in the t-test was lower than the significance level α.

When the assumption of normal distribution of the variable was not met, we used Man-Whitney's test as an alternative to the t-test of independent samples. The test requires at least orderly levels of measuring the dependent variable. The null hypothesis is: H_0: $F_1 = F_2$ against H_1: $\sim H_0$, where F_1 and F_2 are cumulative distribution functions for probability distributions of the dependent variable in compared populations. If there are no tied ranks in the sample, the test statistic is (Szymczak W., 2010):

$$Z = \frac{U - \frac{1}{2} \cdot n_1 \cdot n_2}{\sqrt{\frac{1}{12} \cdot n_1 \cdot n_2 \cdot (n_1 + n_2 + 1)}}, \quad (4)$$

where: $U = n_1 \cdot n_2 + \frac{n_1 \cdot (n_1 + 1)}{2} - R_1$.

If there are tied ranks in the sample, the test statistic is:

$$Z = \frac{U - \frac{1}{2} \cdot n_1 \cdot n_2}{\sqrt{\frac{n_1 \cdot n_2}{n \cdot (n-1)} \cdot \left[\frac{n^3 - n}{12} - \sum \frac{t_i^3 - t_i}{12}\right]}}, \quad (5)$$

where: $n = n_1 + n_2$, t – the number of observations tied with a given rank.

In both cases the *Z* statistic is supposed to produce an approximately normal distribution with parameters 0 and 1. Since the null hypothesis states that two independent samples come from the population representing the same distribution, differences between populations are considered statistically significant if the probability in the Mann-Whitney's test is lower than the significance level α. For the study we assumed a standard level of significance α=0,05. Calculations were made in IBM SPSS Statistics 22.0.

2. Results

In the first stage of the study we analyzed all enterprises regardless of the country of operation or sectoral affiliation (Table 1). A complete set of selected variables was used. The obtained results allow formulating some general conclusions. First and foremost, value-wise we should highlight strong distribution of all tested variables. The arithmetic mean is significantly different from the median and the value of standard deviation is high. This demonstrates wide variety of companies' financial standing and financial strategies they employ. It should be noted, however, that the surveyed population comprises entities from different countries, operating in different sectors, of varying sizes and stages of development. Therefore the observed diversity seems to be justified. The obtained results mostly indicate statistically significant differences in the level of tested variables. Only in the case of profit margins and ROA, the probability of differences is too low. In all cases differences between mean values in both groups are reflected in a similar relationship between medians.

Table 1

Gearing, profitability and liquidity of family and non-family listed companies from Central and Eastern Europe in 2007-2016 - general results

Variable	Type of company	n	Mean	Median	Standard deviation	p
Gearing (in %)	Family	501	56.968	16.943	106.894	0.038*
	Non-family	3207	60.381	17.217	117.438	
Interest cover	Family	287	15.021	1.618	74.277	<0.001*
	Non-family	1840	12.191	1.442	84.596	
Profit margin (in %)	Family	545	-2.905	1.451	26.438	0.456
	Non-family	3462	-0.016	2.035	23.710	
ROE (in %)	Family	590	0.095	0.669	54.120	0.011*
	Non-family	3595	-0.116	0.063	60.421	
ROA (in %)	Family	642	-0.278	0.062	13.322	0.238
	Non-family	3836	1.214	0.874	14.227	
Current ratio	Family	641	3.195	1.352	7.272	<0.001*
	Non-family	3797	3.121	1.145	7.815	
Liquidity ratio	Family	638	2.683	0.907	7.369	<0.001*
	Non-family	3779	2.509	0.762	6.893	

The significance of differences was assessed using Mann-Whitney's or t test.

** - statistically significant differences at α = 0,05; ** - statistically significant differences at α = 0,10*

Source: author's calculations based on Amadeus.

Family businesses are characterized by lower gearing than non-family ones, although the use of debt in both groups is low, especially if median value is taken into account. The interest cover in family businesses is also higher than in other

entities. This may be indicative of conservative funding policy. It should be noted, however, that median value is significantly lower than the average and it does not allow assessing such a situation categorically. From the analysis of family businesses profitability it is also difficult to draw any far-reaching conclusions. Those companies achieve lower profit margins than non-family enterprises, however, as already indicated, the differences are not statistically significant. A similar situation occurs when it comes to the return on assets (ROA). The only binding conclusion can be deduced from ROE differences analysis. The value of this variable for family businesses is higher than for non-family enterprises. It should be noted, however, that achieved profitability is very low, especially for non-family businesses. The average value is negative and median is close to zero. This is caused by relatively big group of companies with highly negative profitability. They mostly come from Moldova, Romania and Serbia. Profitability of family businesses cannot be recognized as satisfactory because most of them do not exceed 1%. Such results indicate there are many companies of very low profitability. This applies to both groups, although to a lesser extent to family companies. The most significant differences were observed for financial liquidity. The results suggest high liquidity of both groups of enterprises, although higher for family businesses. It concerns both - current liquidity and liquidity ratios and demonstrates that inventories do not have significant impact on liquidity level. For both variables median value is substantially lower. Nevertheless, this level should also be regarded as moderately high, especially for family businesses. Such median and average relationship indicates that, in contrast to profitability, both groups have a high number of high-value observations, i.e. companies with very high liquidity. In general, it may be noted that for statistically significant differences, family firms present more cautious funding policy than their non- family counterparts. They have lower share of debt in liabilities, higher interest coverage by operating profit, higher ROE and higher liquidity.

In the next stage of the study we focused on the profile of the surveyed companies. For this purpose, the analyzed population was divided according to the criterion presented in the previous chapter. Due to significantly greater number of indicators that would have to be examined in the sectoral context, we decided to choose one variable for debt (gearing), profitability (ROE) and liquidity (current ratio). As before, there is strong variation observed within each group of enterprises (Table 2). The arithmetic mean is significantly different from median and the value of the standard deviation is high. Most of the differences are statistically significant. Interestingly, in these particular business groups observed levels of variables do not differ significantly, indicating that there are no significant differences in corporate finance policies.

Table 2

Gearing, profitability and liquidity of family and non-family listed companies from Central and Eastern Europe in 2007-2016 – business division results

Industry	Variable	Type of company	n	Mean	Median	Standard deviation	p
Manufacturing	**Gearing (in %)**	Family	532	72.116	20.017	148.873	0.061**
		Non-family	2108	66.158	21.203	125.781	
	ROE (in %)	Family	549	-2.13	1.86	66.54	<0.001*
		Non-family	2133	-3.47	1.41	61.01	
	Current ratio	Family	538	2.97	1.32	5.79	<0.001*
		Non-family	2090	2.89	1.16	5.81	
Construction and real estate	**Gearing (in %)**	Family	126	55.707	9.240	106.640	0.348
		Non-family	853	57.661	11.801	113.100	

	ROE (in %)	Family	138	-0.36	0.36	36.47	0.021*
		Non-family	873	-0.36	0.75	55.47	
	Current ratio	Family	135	3.87	3.99	11.11	0.042*
		Non-family	856	2.5	1.28	9.11	
Wholesale and retail trade	**Gearing (in %)**	Family	116	54.790	7.647	116.734	<0.001*
		Non-family	540	58.117	12.693	114.685	
	ROE (in %)	Family	122	-1.4	0.02	32.38	0.063**
		Non-family	564	-4.22	-0.21	43.70	
	Current ratio	Family	120	4.22	1.15	9.32	0.911
		Non-family	553	3.57	1.13	8.51	
Services	**Gearing (in %)**	Family	203	53.265	13.902	92.651	0.028*
		Non-family	1009	59.192	16.685	108.011	
	ROE (in %)	Family	234	3.22	1.21	102.69	0.174
		Non-family	1082	-0.13	0.54	81.02	
	Current ratio	Family	229	3.33	1.13	4.49	<0.001*
		Non-family	1060	2.00	0.94	8.73	

The significance of differences was assessed using Mann-Whitney's or t test.

** - statistically significant differences at α = 0,05; ** - statistically significant differences at α = 0,10*

Source: author's calculations based on Amadeus.

The highest level of debt is observed in manufacturing companies. It is also the most numerous among distinguished groups. The level of debt clearly stands out from the rest of the observations. At the same time these companies, are characterized by the worst profitability, although in this case the difference is not so significant. They also do not have high liquidity in comparison to other groups. The group of service companies appeared as the most profitable while the highest liquidity was recorded in the wholesale and retail trade group.

It is difficult to unambiguously assess the issue of debt when analysing differences between family and non-family businesses. While debt of family firms in the group "Wholesale and retail trade" and "Services" is lower than for non-family ones, in case of manufacturing companies the situation is the opposite. "Construction and real estate" family companies are also less indebted than non-family counterparts, but these differences are not statistically significant. It can be noted that median values for family businesses are lower. However, they are significantly lower than the corresponding average which means there is a group of companies with very high level of debt. This applies both to family and other businesses.

Comparison of profitability in both groups of companies also does not allow drawing any clear conclusions. "Manufacturing" and "Wholesale and retail trade" family businesses achieve higher profitability than other entities. However, it must be noted that their performance is generally poor. In case of "Construction and real estate" group the averages are equal and negative. Median values indicate better profitability for non-family businesses. Servicing family businesses have also shown higher profitability, however, these differences are not statistically significant. Median analysis shows that this variable is almost always higher than the corresponding average. Servicing family companies are the exception here. It means there is a group of companies whose level of profitability is very high but they are not representative for the majority of entities. Moreover, their median values for family businesses are higher than for other companies. Therefore we may presume that better financial results are achieved by family businesses, however, it is hard to conclude it categorically.

The analysis of differences in financial liquidity between family and non-family firms seems to be more coherent. With the exception of "Wholesale and retail trade" group differences have been statistically significant. Moreover, in all cases, average liquidity in family businesses was higher than in non-family ones. A similar relationship is observed in median analysis. Their values, however, are generally below the average, indicating the overall lower level of liquidity. Yet, the fact remains that family businesses represent higher liquidity. Moreover, it should also be noted that liquidity levels are generally high. This is true primarily for "Construction and real estate" family companies. For them such a high average is even lower than the median, meaning de facto even higher financial liquidity. In other groups, the current ratio values are also high - average values are well above the recommended levels and indicate over-liquidity. This applies in particular to family businesses.

In the third stage of the study we focused on national characteristics of family business financing. Due to technical restrictions and big number of results achieved it was impossible to present full statistical characteristics of the study in this publication. Therefore only mean values for chosen variables and countries to which they were assigned are presented (Table 3). The other measures analyzed above have also been estimated. Results are consistent with those presented so far, but they are related to ca. 65% of analysed companies. This is true in particular for significant differences between mean and median levels and high value of standard deviation. This is indicative of highly differentiated observations.

Table 3

Average gearing, profitability and liquidity of family and non-family listed companies from Central and Eastern Europe in 2007-2016 – national results

Variable	Type of company	Country						
		Bulgaria	Hungary	Poland	Romania	Russian Federation	Serbia	Ukraine
Gearing (in %)	Family	42,304* (n = 33)	56,182* (n = 67)	59,501** (n = 72)	51,661 (n = 57)	72,423* (n = 39)	67,254* (n = 80)	49,820 (n = 44)
	Non-family	47,446* (n = 296)	44,428* (n = 314)	67,866** (n = 488)	56,078 (n = 371)	85,180* (n = 564)	69,591* (n = 410)	63,533 (n = 417)
ROE (in %)	Family	1,951 (n = 33)	3,119** (n = 67)	4,273* (n = 72)	1,402* (n = 57)	9,823* (n = 39)	-7,209* (n = 80)	10,962 (n = 44)
	Non-family	1,439 (n = 296)	0,296** (n = 314)	2,721* (n = 488)	-3,598* (n = 371)	13,831* (n = 564)	-13,343* (n = 410)	11,077 (n = 417)
Current ratio	Family	5,472* (n = 33)	3,037** (n = 67)	2,714* (n = 72)	3,840* (n = 57)	1,694** (n = 39)	1,933** (n = 80)	5,810* (n = 44)
	Non-family	4,091* (n = 296)	1,280** (n = 314)	2,527* (n = 488)	3,555* (n = 371)	1,116** (n = 564)	1,746** (n = 410)	4,226* (n = 417)

The significance of differences was assessed using Mann-Whitney's or t test.

** - statistically significant differences at α = 0,05; ** - statistically significant differences at α = 0,10*

Source: author's calculations based on Amadeus.

The highest levels of indebtedness have been revealed by Serbian and Russian companies. They are particularly different from average values observed in earlier stages of the study. Bulgarian and Hungarian companies are the least indebted, although they are not so much different from the overall average. Most gearing differences between family

companies and others are statistically significant and lower for family businesses. This is particularly evident in the case of Polish and Russian companies. The exception to this is family-owned Hungarian companies that have higher gearing than indigenous non-family businesses. In the case of family businesses in Romania and Ukraine also lower debt compared to other companies was observed, but these differences proved to be insignificant. The study did not include companies from Bosnia and Herzegovina, Croatia, and Moldova. Despite their considerable size (altogether more than 800 entities) they were not comparable because of mostly too small numbers of family businesses (especially in Croatia) and too much data deficiency to compare gearing, profitability and liquidity simultaneously. There was also a very high diversity of results observed, significantly exceeding (already high) this which have been presented so far (especially in Moldova). This causes doubts over the quality of financial data provided by these companies. Our analyses carried out for these groups were mostly inconclusive because there was no statistical significance of differences between analyzed variables.

Profitability analysis, as well as gearing analysis, is not fully conclusive. The observed levels of profitability are very diverse. Best results were recorded by Ukrainian and Russian companies. At the other extreme there are companies from Serbia and Romania. Most profitability differences between family companies and others are statistically significant and indicate higher ROE of family businesses. This is especially true for Hungarian and Polish companies. Observations of Russian and Ukrainian companies indicate the opposite relationship. The differences of the latter are, however, insignificant. Most of the observed cases allow supposing that family companies achieve higher profitability from non-family businesses, even if, as in the case of Bulgaria, it is hard to confirm it statistically.

The most consistent conclusions are once again provided by liquidity analysis. All differences in liquidity levels observed in all groups were statistically significant, although at different but acceptable levels of significance. All comparable groups in all countries showed higher liquidity of family firms in comparison to non-family businesses. Bulgarian and Ukrainian companies were the most liquid. Like in previous analyses, determined values significantly exceed recommended levels and showed substantial over-liquidity. The lowest liquidity is characteristic for companies from Russia, although even in this case it is at acceptable level. Finally, it is worth noting that Poland and Serbia are the only countries where family companies exhibit features typical of conservative financing strategy. They are less indebted, more profitable and liquid than non-family businesses. A similar situation exists in Bulgaria and Romania, but not all differences are statistically significant. Russian family companies are relatively less indebted in comparison to non-family ones, but they are less profitable so they may have limitations in debt financing. Nevertheless, such strategy should also be considered conservative. In case of Hungarian family companies more aggressive policy involving the growth of debt with better liquidity and profitability can be found.

Conclusions

Results of literature and empirical studies presented in this article reveal significant diversification of family businesses. Do they apply any specific funding strategy? It is difficult to confirm unequivocally, but the research seems to confirm this. At general level, statistically significant differences in gearing indicating lower indebtedness of family businesses compared to other firms have been identified. Similar conclusions were drawn from companies' business profile analysis. Although results were neither entirely clear nor statistically significant, they confirmed such relationship in vast majority of observations. A similar situation occurred during family businesses analysis in the national context. Therefore, we may assume that family businesses compared to non-family businesses use lower gearing. There are many reasons for such behaviour. Profitability accompanying the examined debt levels does not allow defining its impact on family businesses financing strategy. Both, at the general and sectoral or national level we can find evidence of higher profitability of family businesses. However, they are accompanied by a significant number of opposite or statistically

insignificant observations. Moreover, profitability of surveyed enterprises is low. It may explain low level of indebtedness, not as a part family business financial strategy, but rather as a consequence of difficult access to debt. On the other hand, low ROE in surveyed family businesses can also be the effect of excessive participation of equity, which is confirmed by previous studies. However, this is not unequivocal.

Much more information about family business financial strategies can be obtained from their financial liquidity analysis. General and national studies clearly indicate higher liquidity of family companies in comparison to non-family enterprises. In sectoral perspective there are some statistical doubts about this relationship but there is no evidence against it as well. The companies maintain very high liquidity, even inadequate to their economic performance. This seems to be the main proof of peculiarity of family business financing and has a logical explanation. Maintaining high liquidity and low indebtedness when economic performance is poor testifies to careful business doing. It must be borne in mind, however, that family businesses are often the most important family asset. They provide income and often give jobs to many of its members. It is natural to them to limit the risk of potential loss of this asset, even at the price of lower efficient. This is the essence of family business uniqueness and financial management is usually subordinated to it. This study clearly confirms this.

Finally, it is worth to point out that conclusions presented above are subject to certain limitations. The study was conducted during major political and economic changes. The groups of enterprises covered by the analysis, despite being affiliated to the same geographic zone, developed differently and have different developmental experiences. Some companies operate in the European Union and function in different legal, political or competitive conditions. Capital markets where they are listed are also different. These, and many other factors, can affect company's financial decisions, as well as the results of the study, especially in statistically uncertain cases. This applies both to the conclusions of the article and further research in this area.

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SMART PEOPLE: REGION PROCESS ANALYSIS

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Abstract. Ensuring sustainable development of Latvia economics must be based on region development, which is possible, if smart specialization is realized and development of rural areas is promoted. The main condition of rural areas development is human capital availability; therefore, it is very important to find out its potential in context of smart people concept. In Latvia until this smart people approach is practically not used in research of human capital. Smart people situation research is realized by authors in Vidzeme planning region.

The aim of this research is to find out the smartness potential of Vidzeme planning region rural areas inhabitants and to identify tendencies of human capital changes in context of smart economics development.

To analyse region human capital situation and find out the tendencies of changes, authors used monographic method and analysed statistic data. Statistic data characterize inhabitant's smart potential aspects incomplete, that's why authors also used data of focus group interviews in territories of deeper research and method of hierarchy analysis.

This article examines theoretical concept of smart people as aspect of human capital notion transformation. Also, it shows the analysis of Vidzeme planning region strategic planning documents in context of smart economics development. Authors are selecting and analysing the main statistic indicators, which characterize the smartness of rural areas human capital. They also evaluate aspects of human smartness in deeper research territories (municipalities Mazsalaca and Koceni) and in region overall. As a result, the smart people situation is clarified and the main tendencies of changes concerning human capital in Vidzeme planning region are found out, also possible directions of development are proposed for municipalities to develop and involve the human capital.

Key words: *human capital, smart people, changes, tendencies, rural areas.*

JEL code: *O15, 018, R11, R23*

Introduction

There is an objective necessity to ensure sustainable development of economics in the present society evolution phase, and it is also a challenge for the economics of Latvia because only in this way it is possible to provide state competitiveness and growth of social welfare in the future. The country's economic sustainability is possible only if a balanced regional development is ensured. The European Union's strategic planning framework *Europe 2020: A strategy for smart, sustainable and inclusive growth* anticipates that a sustainable economy has to be based on regional smart specialization (European Commission, 2010). Smart specialization is a strategic approach to the economic development by developing research and innovation for local business, in order to foster innovation and productivity growth in areas where the region has competitive advantages and potential for innovation (Vidzeme Planning Region, 2015). Smart and sustainable development of territories is based on innovative and knowledge-intensive economy, creative and active people, sustainable management of resources, developed IT infrastructure, under the umbrella of the local administration that provides the synergy of these factors (Zvirbule et all, 2016).

The main driving force in ensuring smart specialization is human capital. Currently in Latvia there is a clear trend of decreasing population, affecting both the availability of the human capital and its quality aspects posing a threat to the

economic development. It is particularly important to identify the human capital situation in the regions, assessing them in the context of smart economy development. It is also relevant to Vidzeme Planning Region (VPR) with the smallest population among the regions of Latvia (State Regional Development Agency, 2017). The study should answer the following questions: What indicates the smartness of VPR population? What changes can be observed in the region in the area of human capital? The results of the research will allow developing recommendations in the future for Vidzeme Planning Region municipalities in the field of human capital; as well as that, the findings will be used for the development of guidelines for smart development of Latvian rural areas.

The aim of this research is to find out the smartness potential of the inhabitants of Vidzeme Planning Region rural areas and to identify tendencies of human capital changes in the context of smart economy development.

The following objectives were set to achieve the goal: to explore the theoretic concept of smart people in the context of human capital concept transformation; to find out the smartness potential of the inhabitants of Vidzeme Planning Region rural areas by performing the analysis of statistical indicators characterizing region's smart people and the case study in Koceni and Mazsalaca municipalities; to identify the tendencies of human capital changes in the rural areas of Vidzeme region and lay down the main human capital development directions in the context of region's smart development.

The study covers the rural areas of Vidzeme Planning Region.

The authors used the monographic method – conducted the study of the theoretical literature to find out the dimensions characterising smart people and select indicators for statistical data analysis. Statistical data analysis method was used in assessing the situation of the region's human capital smartness and change trends. Since the statistical data do not adequately reflect the smartness, the focus group interviews were used in in-depth research areas. The selection of territories was based on ESPON CUBE methodology (ESPON, 2015). 4 municipality clusters were singled out in Vidzeme region with a different pace and level of development, of which Mazsalaca and Koceni municipalities were selected for the research. In the framework of the Analytic Hierarchy Process (AHP) method, by using the analysis of expert opinions, the impact of the indicators related to population on VPR smart territory development was determined.

The study presents the novelty, since until now the human capital within the concept of smart people has not been analysed.

Research results and discussion

1. Smartness of human capital

Each period of the society development puts new demands on the human capital, so the change in society transforms also the human capital content.

The current human capital challenges in knowledge economics are determined by the main groups of indicators: changes in work functions (decentralization of company governance; distant work; dominance of intellectual work etc.); changes in the structure of enterprises (development of small and middle enterprises; increase of self-employed people; high level of self-organization in work etc.); the rapid entry of innovation and technology in daily life; changes in the education (knowledge governance know-how; cooperation skills; forming of business competences etc.) (Bikse, 2011).

Currently broader human capital interpretations are dominating – including individual's knowledge, skills and created innovations, as well as a set of personal qualities, world views, values that can directly affect the production performance (NikMaheran et all, 2011, Ployhart and Moliterno, 2011, Neagu, 2013, Gennaioli et all, 2012). More and more attention is paid to qualitative aspects, emphasizing the need for diverse competencies, with a particular emphasis on entrepreneurial ability (EU, 2015, Kwon, 2009, Bikse, 2011, 2014, Riemere 2014, Rivža 2014).

The Organization for Economic Co-operation and Development (OECD) define human capital as the assembly of knowledge, capacities, competences and attributes of the people who make easier the creation of the personal, social and economical welfare (OECD, 2001).

Summarizing the key aspects of human capital, the authors already in previous studies in human capital analysis suggests using the concept of smart people. A smart person is someone who has acquired diverse *competences* (knowledge, skills, abilities) through education or life experience, who is energetic and open to *new ideas*, *cooperation* and meaningful *social relationships*, intelligent in judgments and actions that are realized in *active participation* (business, non-governmental organizations, charities, and other activities significant for the individual and society) (Melbārde, 2017).

Smart person is characterised by four basic dimensions: key competences, openness to ideas and entrepreneurial qualities, formation of social relationships and active participation. Defining the dimensions forms the basis for selecting the statistical indicators characterizing the smartness. Human capital smartness shows that a person has all of these key dimensions.

2. Analysis of statistical indicators

The study covers the rural areas of Vidzeme Planning Region – 25 municipalities. According to the census in 2011, in Vidzeme Planning Region of 208.695 thousand inhabitants there were 183.874 thousand rural population (State Regional Development Agency, 2017). The territories chosen for in-depth study – Koceni and Mazsalaca municipalities are classified as rural areas; more than 50% of the population is living in rural territories of the municipalities.

Table 1 shows the indicators characterizing VPR population.

Table 1

Research territories and inhabitants

Indicators	Vidzeme region	Kocēni Municipality	Mazsalaca Municipality
Territorial development index (2015)	-0.778	+0.419	-1.84
Area, km² (2017)	15 220.48	496.90 (3.3%)	417.19 (2.7%)
Population at the beginning of the year (2017)	208 695	6 441	3 325
Population density, people/km² (2016)	13.71	12.96	7.97
Long-term migration balance (2015)	-2 212	-32	-62
International long-term migration balance (2015)	-1 364	-43	-39
Working age population, % (2017)	61.5	60.2	59.4
Registered unemployment rate at the beginning of the year, % (2017)	9.2	5	4.6
Long-term unemployed, the proportion of the total number, % (2017)	31.6	11.5	11.8

Source: author's construction based on State Regional Development Agency, 2017, the Central Statistical Bureau, 2017, the National Employment Agency, 2017.

The table shows that the region's TDI is negative, but the municipalities selected for analysis have different TDI values – for Koceni it is positive, but for Mazsalaca – negative. The statistical data point to the relation between the territorial development and the available human resources in quantity and quality. Koceni area is 3.3% of the total VPR area, the area of Mazsalaca – 2.7%, but there are large differences in the number of inhabitants– the population of Mazsalaca is half of the population of Koceni, also the population at working age is higher in Koceni.

Both municipalities and the region as a whole also experience the population outflow: both changing the place of residence within the country and emigration, in spite of the differences in spatial position (Koceni is located in the outskirts of the city of Valmiera, but Mazsalaca - close to Estonian border). The region has a high unemployment rate, but the long-term unemployed comprise almost a third of the total number, indicating the problems with regard to labour competencies, enterprising attitude and social skills. Both the unemployment rate and the proportion of the long-term unemployed in both municipalities are similar and significantly lower than the VPR figure. It can be concluded that both municipalities investigated and the region as a whole is losing population, thus reducing human capital and posing a threat to the development of the territories.

In order to analyse the situation of Vidzeme region's population smartness, the authors, based on four key dimensions of smart people, selected five statistical indicators: people with higher education per 1000 inhabitants; primary sector employees, the proportion of the total number, %; long-term unemployed, the proportion of the total number, %; local action groups (LEADER), number/attracted funding, EUR; NGOs (associations, foundations, non-governmental organizations) per 1000 inhabitants.

During the study the indicators characterising smartness were calculated and analysed. Table 2 shows the main indicators.

Table 2

Indicators of people smartness in VPR

Indicators	Inhabitants with higher education per 1000 inhabitants	Primary sector employees, the proportion of the total number, %	Long-term unemployed, the proportion of the total number, %	Local action groups (LEADER), attracted funding, EUR	NGOs (associations, foundations, non-governmental organizations), per 1000 inhabitants
Average in VPR	161.8	12.6	31.6	7 175 197	9.2
Maximum value in VPR	218.7 Cesis Municipality	31.2 Naukseni Municipality	43.6 Madona Municipality	1 564 423.34	14.5 Burtnieki Municipality
Minimum value in VPR	102.5 Strenci Municipality	3.6 Cesis Municipality	5.9 Naukseni Municipality	459 521.55	5.2 Strenci Municipality
Average in Latvia	230	10.00	30.6	866 830.41	10.5

Source: author's construction based on State Regional Development Agency, 2017, the Central Statistical Bureau, 2017, the National Employment Agency, 2017, SIA Lursoft IT, 2017, The Rural Support Service of the Republic of Latvia, 2017.

Inhabitants with higher education per 1000 inhabitants (starting at age 15) – 161.8, which is the lowest figure of all regions (in Pieriga PR - 245, Kurzeme PR - 168.8, Zemgale PR - 173, Latgale PR - 169.8), which causes caution in

assessment of the competence level, creativity and ability to innovate of the human capital (Central Statistical Bureau of Latvia, 2017).

Primary sector employees (the proportion of the total number, %) within the region show very different situation: Naukseni Municipality - 31.2%; (in 5 municipalities of the region over 20%), but Cesis Municipality 3.6%, Ligatne Municipality - 5.5%, Priekuli Municipality - 6.7%. The results do not show the smartness of the population, but rather point to the connection to natural resources and rural areas. Both previously mentioned indicators are calculated based on the census in 2011, which now could be changed.

Long-term unemployed (the proportion of the total number, %) on 30.06.2017. – 31.6%, which is the second highest figure in Latvia (Latgale region - 54.8 %, Kurzeme region- 29.8%, Zemgale region-22.11%, Pieriga region-13.6%), shows that there are many inhabitants with inadequate competences, personality traits that do not allow joining the labour market (The National Employment Agency, 2017).

Local action groups (LEADER approach 2007-2013) - 8, attracted 7 175 197 euro, which is 21 % of total funding available in state. Non-governmental organizations (associations, foundations, public organizations) in 2017 are 1683 or 9.2 per 1000 inhabitants. The last two indicators show a significant initiative, self-organization and activity of the population.

In the framework of National Research Programme the indicators of smart territory development were summarized, the standardization of the indicators was conducted and the synthesized index was calculated (Table 3).

Table 3

Standardised values of inhabitants dimension and synthesized index of territory

Municipality	Inhabitants	Index
Aluksne	0,106	4,589
Amata	3,517	14,568
Apes	-2,750	2,373
Beverina	2,555	3,127
Burtnieks	2,075	-2,636
Cesis	7,016	16,642
Cesvaine	-2,776	-2,978
Erglu	0,308	4,427
Gulbene	-0,598	3,127
Jaunpiebalga	0,628	3,634
Koceni	3,430	6,482
Ligatne	2,580	7,196
Lubana	-1,709	-0,727
Madona	-0,238	10,084
Mazsalaca	-1,661	6,999
Naukseni	-4,411	-1,811
Pargauja	1,288	5,709
Priekuli	3,217	12,091
Rauna	-0,105	-1,633
Rujienas	-1,359	-3,617
Smiltene	-0,462	2,108
Strenci	-4,635	10,302
Valka	-0,583	-1,456
Varaklani	-4,887	-2,951

Source: author's construction based on State Regional Development Agency, 2017, the Central Statistical Bureau, 2017,the National Employment Agency, 2017, SIA Lursoft IT, 2017, The Rural Support Serviceof the Republic of Latvia, 2017.

Analysing inhabitants' dimension, conclusion is that inhabitants' standardised values significantly differs in Vidzeme region municipalities, enabling to classify municipalities in two groups – with positive and negative value. 11 Municipalities of 25 have a positive value, namely Cesis, Amata, Koceni, Priekuli, Ligatne, Beverina, Burtnieks, Pargauja, Jaunpiebalga, Ergli, Aluksne municipalities; Cesis Municipality (7.016) had the highest assessment, but

Varaklani Municipality – the lowest (-4.887). One can also argue that smart people compensate for the lack of environment and resources, providing the overall smart development (Amata Municipality, Ligatne Municipality). If there is a smart collaboration of people and governance, it has a decisive influence on the smart municipality development (smart development index): Cesis Municipality has both the highest population assessment, and it has the highest smart development index, while Amata Municipality has the second highest population assessment and the development index.

3. Case study

Statistics, however, do not adequately reflect the qualitative aspects of the smart population, thus focus group interviews were organized in Mazsalaca and Koceni municipalities. Interviews were carried out with focus groups of municipal staff, business people and representatives of non-governmental organizations, represented by 31 participants.

Interview questions were designed to assess citizens' smartness aspects and identify the changes that happen to people in rural areas.

All respondents are concerned about the population decline and the worsening of the demographic indicators; the mobility of the population has a tendency to increase which is reflected in the region through internal migration processes: people want to live closer to the workplace, school, cultural and entertainment facilities, use the infrastructure of high-quality roads and communications. There is a tendency to return to family estates in order to live in a natural environment, enjoy the beauty of the landscape, provide children with a green living environment, and develop an environmentally friendly business. The return of people to their origins is more typical of Koceni Municipality, which can be explained by the location of the territory in the vicinity of Valmiera that provides jobs, a relatively high level of income and standard of living. In both municipalities the population is more concentrated around the centre of the municipality; the remote territories often remain half-empty. During the interviews the residents did not particularly emphasize the external migration, thus indicating with their attitude that the return of those who had left would probably not happen, and therefore we needed to think about how to improve the economic situation in the regions with the remaining population.

Despite the differences in the economic development level and pace, a significant population activity can be observed in both regions, which is mainly manifested in cultural life and sports, the organization of educational events, also in raising funds for the activities of non-governmental organizations. In Mazsalaca there are 38, but in Koceni -75 associations, foundations and non-governmental organizations (SIA Lursoft IT, 2017). One of the community activities is the preservation of cultural and historical sites. Many associations successfully operate thanks to the activity of their enthusiastic leaders. Non-governmental activities are a means not only for people to get away from the daily routine, but also to involve in self-employment. A proof of the population activity is the development of entrepreneurship in the municipalities characterized by economically active enterprises. According to the data from April 27, 2017, business activity is significantly higher in Koceni Municipality with 667 economically active companies, but in Mazsalaca – only 294 (SIA Lursoft IT, 2017).

The interviews showed that the involvement in NGOs and business was largely determined by people's personality traits and the character. NGO representatives emphasized the sense of mission, care for their municipality, also a desire of self-assertion. The entrepreneurs of the municipalities stressed that there should be the courage to accept risks, follow the novelties. The respondents were characterized by a desire for independence and freedom, a strong sense of responsibility – the activity was encouraged by the responsibility for their own life, family, municipality. Many entrepreneurs underlined that the necessary qualities for business and life originated in family, values were passed down from generation to generation, some of them stressed that the enterprising attitude was hereditary.

In parallel with the economic and social activity, there exists a certain distancing between the population groups, especially among entrepreneurs. They are reserved with regard to business cooperation, collaboration, more willing to

cooperate with other municipalities, foreign partners instead of using the resources of their own municipality, e.g., Koceni entrepreneurs do not develop the business association of their own municipality, but collaborate with the entrepreneurs of Valmiera. Such attitude can be explained by both the fear of competitors, and personality traits – certain individualism, hypertrophied sense of responsibility for their actions. Local government employees are taking the initiative and doing a lot in order to achieve better communication and cooperation among residents within various projects and events, however, certain alienation remains.

The employees of the investigated municipalities believe that the local government is trying to stimulate citizens' initiative, often taking on the role of a mediator and doing more than required by the law and their function. Part of the local government employees is patriots of their municipality who have returned to their native municipality after studies, others have returned to their family estates to preserve and restore them.

All focus group participants stressed the importance of education in today's world, by education meaning learning in educational institutions. Everybody believes it determines the whole life and work. The interviewed entrepreneurs pointed out that they had obtained a good education to be able to successfully start and run a business, but still needed to learn throughout their lives. Work experience gives the necessary skills and abilities that cannot be obtained at school. The need of foreign languages and IT skills was emphasized. The municipalities have a good IT infrastructure, people have acquired the IT user skills, but it is necessary to master the use of IT tools for business needs.

The level of knowledge and attitude in labour issues of youth has been critically assessed. The residents appreciate the region's supply of education and its level, but practically nobody uses the research capacity and infrastructure of the educational institutions, since there is an unawareness of the opportunities offered.

It is concluded that people think less and less in short-term categories, but plan their life in the long term, preserving the environment and resources.

In the framework of National Research Project ECOSOC LV, by using the Analytic Hierarchy Process (AHP) method (Saaty, 1994), the expert opinions were summarized and the results were processed mathematically carrying out the assessment of four groups of factors affecting the smart territory formation and development – population impact, local authority impact, state impact and the EU impact. Results are summarized in Table 4.

Table 4

Factors affecting the smart territory formation and development

Affecting factors and numerical values							
Population impact	**0.19**	**Local authority impact**	**0.28**	**State impact**	**0.28**	**The EU impact**	**0.25**
Activities of particular groups of residents in acquisition and dissemination of ideas, innovative changes	0.051	Skills of county municipality to attract and manage the EU funding	0.064	Providing a stable and sustainable economical situation	0.074	Influence and progress of Cohesion policy to reduce differences between EU regions	0.061
Use of residents' disposable resources for income generation	0.044	Competence of employees in making and realizing governance decisions	0.073	State participation in promotion of innovative business	0.068	Promotion of innovative processes cooperating with EU countries and regions	0.057

Residents' entrepreneurial ability and capacity	0.047	Local authority ability to cooperate with inhabitants and businessman	0.074	Providing availability of EU funding to promote smart specialization in regions	0.070	EU strategy and conditions for business development and innovative activity	0.065
Involvement of residents in formal and non-formal education	0.049	Local authority role in effective use of resources	0.069	Finance equalizing and successful realization of tax policy	0.069	Conditions of creating region specialization and competitiveness in EU policy	0.068

Source: author's construction based on data of the National Research Program EKOSOC-LV 5.2.3

According to the expert assessment, in Vidzeme region the local authorities (0.28) and the state (0.28) have the greatest impact on the smart development of the territory, followed by the European Union (0.26), while the population has the lowest impact (0.19). In spite of the economic and social activity of the population, the ability to impact the region belongs to the local authorities, which could be explained by managers - leaders and a strong team that is able to intelligently manage municipal processes in the interest of the majority of the population.

.Analysing the population impact sub-factors according to their importance, they are listed in the following order:

- Activities of particular groups of residents in acquisition and dissemination of ideas, innovative changes;
- Use of residents' disposable resources for income generation;
- Residents' entrepreneurial ability and capacity;
- Involvement of residents in formal and non-formal education.

The experts also assessed the possible alternatives of development. For the smart territory development, Vidzeme region was offered the smart governance development direction to be implemented only in collaboration with the population, ensuring synergy for region's sustainable development.

Conclusions, Proposals, Recommendations

1. The main prerequisites for sustainable development in rural areas and regions are smart economics, people, resources, synergy of e-environment and smart governance.

2. As a result of society development, the content transformation of the human capital concept has taken place, focusing on human smartness. *Smart person* is someone who has acquired diverse competences through education or life experience, who is energetic and open to new ideas, cooperation and meaningful social relationships, intelligent in judgments and actions that are realized in active participation.

3. Vidzeme Planning Region is undergoing smart people development process, as evidenced by the trends of change:

- The increase in population mobility can be observed, which is primarily determined by the availability of jobs, ability to reach schools, infrastructure and cultural sites, as well as the return of the working population to their family estates in rural areas and a desire to improve their quality of life;
- The activity of the community and self-initiative is increasing, which is significantly influenced by the cultural and historical traditions and municipality support, as well as the activity of community leaders;
- The entrepreneurial potential development is taking place, as determined in the region by strong family traditions and ways of raising children, business experience, education and a set of personal qualities;
- Residents are becoming aware of the diverse opportunities of using IT technologies for communication, remote work and effective business;

- Residents are open to lifelong learning, but insufficiently use the region's research potential and the possibilities it offers, they are unaware of the potential commercial benefits;
- The change of thinking is taking place - short-term consumer thinking is being replaced by informed attitude and behaviour focusing on sustainable development of environmental resources and cultural values.

4. Smart citizens and governance cooperation has a key impact on the development of region's territories - areas with a high population potential have also a high smart development index.

5. In Vidzeme region the scenario for ensuring the smart development is most affected by the governance – but least influenced by the population, which can be explained by strong local government leaders and teams of employees.

Directions of solutions for municipalities in human capital development:

- Development of cooperation among municipalities in order to address the problems created by the migration processes and to coordinate the human capital mobility processes;
- Local governments, entrepreneurs and communities could build networks of cooperation with the educational and research institutions of the region, thus ensuring the full use of the scientific potential in lifelong learning, support to the work of entrepreneurs and local governments;
- Development of communication with the community of the municipality to promote residents' self-initiative and activity;
- Local governments should be the initiators in conservation and promotion of local resources, thus fostering entrepreneurship and ensuring the preservation of human capital and its use on behalf of the municipality and the region.

Acknowledgement

This paper was supported by the National Research Program EKOSOC-LV 5.2.3., a subproject for Latvian rural and regional development processes and opportunities in the context of the knowledge economy regarding development of rural areas and affecting indicators.

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PARTICIPATORY BUDGET - A TOOL FOR THE OPTIMIZATION OF MUNICIPAL COSTS

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Abstract. In the context of the development of strategic planning at the municipal level, increasing the effectiveness of municipal programs is becoming more urgent. In practice, the amount of financing in the budgetary sphere is most often determined by the costs or expenditures of funds. However, in our opinion, when planning municipal programs, it is necessary to apply the basic regulation: the optimal is the number of activities in which the marginal social benefit equals the maximum social costs.

Currently, there are international and domestic specialists who provide a sufficient theoretical basis for this study. The Theory of Public Choice, Constitutional Economics, the Theory of Budgetary Federalism, Modern Studies in the Field of Urban Economics. In the course of the study, the main methods were used: analysis, synthesis, comparison, analogy, modeling, econometrics.

From our point of view, since the local government system allows to determine the preferences of residents for public goods, a participatory budget (initiative budgeting) can become a new tool in optimizing municipal programs. This approach has revealed a new tool for determining the optimal (effective) amount of financing for municipal programs. - participation budget.

Keywords *financial support, local public benefit, participatory budget, public costs, the municipal programs efficiency, budget for citizenry.*

JEL code: G28

Introduction

International practice demonstrates that setting up new legislation without proper economic assessment leads to negative results of the reforms. Emil Markwart, the President of the European Club of Experts in Local Self-Government stated during his speech at the conference "Local self-government and the modern society challenges» held by the «Citizen Initiatives Committee" that the reform of local self-government did not deliver expected results (2017's conference). There is a need for an economic justification of the budgetary spending at the municipal level and new efficient measures.

After analyzing the efficiency of the municipal programs' implementation, two major problems have been discovered: those programs' low efficiency and insufficient citizen's involvement during their planning and implementation. In this research the author has for the first time evaluated the public participation, specifically, the participatory budgeting, as an instrument for value engineering and raising the efficiency of municipal programs.

In the context of strategic planning development at the municipal level, the effectiveness of municipal programs becomes more relevant and the optimal level of their financial provision has been determined (Morunova G.V. 2016a). Application of modern economic theories (public choice, constitutional economics, budget federalism, city economics, etc.) gives an opportunity to determine the optimal ratio of benefits and costs, while planning municipal programs. New solution, which is called proactive budgeting, is being found in state participation in the budget process. This approach assists in increasing the municipal programs efficiency.

In order to achieve the most balanced budget in the conditions of market economy, you must know how to properly and effectively manage finances, how to increase revenues and reduce costs, what are the sources of financing the budget deficit. More attention should be paid to the analysis of such concepts as the budget system, budget process, public participation, state (municipal) tasks and programs, proactive budgeting, and others.

Strong financial position has a positive effect on the implementation of production plans and ensuring the needs of the production resources, therefore, fiscal policy as an integral part of the economic activities of any region or municipal district is aimed at ensuring orderly receipt and expenditure of funds, achievement of rational proportions of budget expenditures and the most effective use.

The objective of the research is to define the role of citizens' public participation in the budgetary process (initiative budgeting, citizens' budgeting) as a new instrument of setting optimal levels of municipal spending. One of the major goals is to find a mechanism of providing citizens' public participation in the municipal budgetary processes.

The importance and innovativeness of the research lies in the fact that for the first time the author produced economic justification of the need for citizens' public participation in the budgetary process and proposed to legislate on the citizens' public participation as an indispensable precondition for making decisions on municipal programs' funding. Another innovative feature is that the author views the citizens' public participation in the budgetary process in a broad sense – as participatory budget (including active participation which is initiative budgeting and passive participation – the citizens' budget).

The results of the research might be practically applied while planning and implementing municipal programs, including the implementation of local citizens' initiatives programs.

Materials and Methods (Theoretical basis)

The research paper used such methods as analysis of literature, Internet resources and statistics, examination and compilation of data, experimental and theoretical methods such as inductive and deductive reasoning, analogy, modeling, econometrics.

Nowadays, there are international and domestic experts' research which provide a sufficient theoretical basis for this study. The theory of public choice, constitutional economics (Buchanan, and Tullock, 1997), the theory of budgetary federalism (Oates, 1972 and Ivanova, 2010), modern research in the field of urban economics (O'Sullivan,2002), Works of Russian scientists (Babichev, Dubrovskaya, 2011, ets) became the basis in determining the optimal (effective) amount of funding for municipal programs. From our perspective, since this system of local self-government makes it possible to identify the preferences of residents for public goods, public participation in the civil process (initiative budgeting) can become a new tool in optimizing municipal programs.

Through the analysis of funding sources of Leningrad region's municipal programs in 2014-2016 (Morunova, 2016b), the author came to the conclusion that "other sources", including citizens' personal finances, do not exceed 1-2%, which demonstrates insufficient citizens' involvement. Furthermore, the analysis of municipal programs demonstrated that the programs do not include any requirements for compulsory citizens' participation, which diminishes their efficiency.

The best experience of the implementation of municipal initiative budgeting projects has been evaluated within the framework of the citizens' budgeting projects competition and it was found that municipal bodies often do not know what to start with and how to involve citizens in the implementation of projects (programs). The research won the citizens' budgeting projects competition and are now practically applicable.

Research results and discussion

Due to the fact that only the citizens' participation makes possible to define the optimal pricing of local public goods, the goods in cases when there is a possibility of choice, must be provided at the municipal level and the municipal program must include citizens' public participation – the participatory budget.The purpose of the research is to prove that the participatory budget is a new instrument for defining optimal spending at the municipal level and that this instrument can be used through the mechanisms of program planning. Another goal is to define the features of the participatory budget and elaborate practical recommendations for municipal bodies.

According to theoretical studies, the local public good has three characteristics:

1. When it is consumed, there is no element of rivalry: this benefit is consumed simultaneously by several people, for example, by planting a territory (the organization of the improvement of the settlement territory). Of course, if the number of consumers becomes large enough, the benefits for each of the residents will decrease, and then the park will become a crowded public good.

2. This is no exception: it is impossible to exclude some people from the process of consuming this product. The park can be protected, but for the municipality it will be too expensive.

3. The advantages of this product are limited to a relatively small area, therefore local public goods are classified as local goods.

Let's consider how the basic rule of efficiency can be applied in planning the financial provision of municipal programs: the optimal is the scope of activity in which the marginal social benefit equals the marginal social costs. For determine the optimal level, it is necessary to know the marginal social benefits of local goods. Let's illustrate what has been said on a simple example frequent for municipal economics tasks. For instance, within the framework of implementation of municipal landscaping programs, citizens should decide how many trees to plant. For some reasons, different groups of citizens have different needs for greening the territory, which is reflected in the unequal amount of benefits received by citizens. Let us assume that opinions of residents, according to this program, can be divided into three main groups. So, the 1st group estimates the marginal benefits (MB) of planting one tree at the cost of 400 rubles, the second one at the cost of 240 rubles and the third at the cost of 160 rubles. According to the principle of reducing marginal benefit, the cost of each subsequent house is reducing in the first group by 50 rubles, in the second group by 30 rubles and in the third group by 20 rubles. Let us summarize these data in Table 1.

Let us suppose as well that the planting of each tree is associated with a cost of 300 rubles, this means that the marginal social costs of planting one tree (MSC) equal 300 rubles and these costs are permanent. Due to the available information, we can conclude that if a decision on the number of necessary trees is taken individually by each group, three trees will be planted in the settlement. All of them will be paid for by the first group, because only this group is ready to pay for the first three seedlings the price not lower than for each seedling. And now remember that the tree (gardening the territory) is a local public good. Since the public good is characterized by non-competitiveness, all consumers can simultaneously successfully consume it. Therefore, the trend of market demand of local public goods can be interpreted as the sum of the benefits received by all consumers for each amount of goods.

Table 1.

The marginal benefits of planting trees

Groups of citizens	1st tree	2nd tree	3rd tree	4th tree	5th tree	6th tree	7th tree	8th tree
First	400	350	300	250	200	150	100	50
Second	240	210	180	150	120	90	60	30
Third	160	140	120	100	80	60	40	20
MSB	800	700	600	500	400	300	200	100

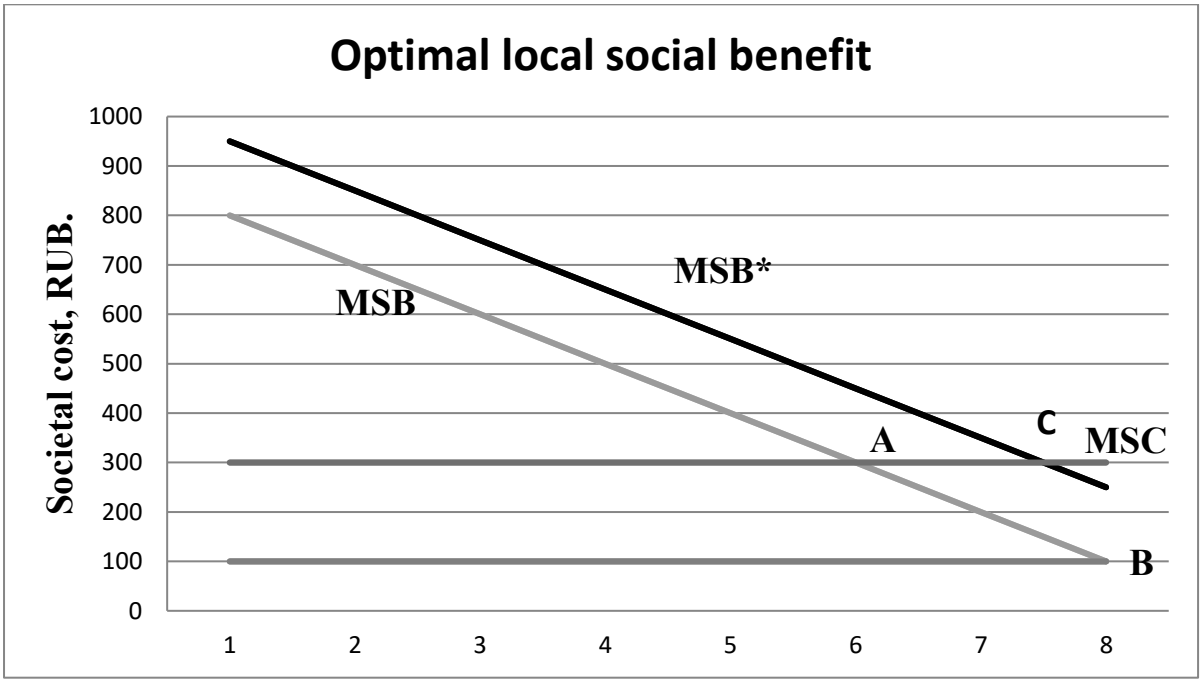
Effective production of local public goods will be implemented under the following conditions: MSC = MSB = ΣMB, where MSC - the marginal social costs of production of local public goods; MSB - the marginal social benefits of using the local public good; ΣMB is the sum of the marginal individual benefits from the use of the public good. Thus, an effective number of trees, which should be planted, will be 6 seedlings (Pic. 1.). This is the exact amount which will provide the equality of the marginal public benefits from trees and the marginal costs associated with their planting.

Let us suppose that the planting of greenery has the following characteristics:

1. Lack of crowding. In a certain range of use of plantations, their area is sufficiently small and therefore there is no crowding.

2. Absence of overflow between settlements. Plantings do not create benefits or costs for residents of other localities.

Under these conditions, the green territory is exclusively a local public good. If there is no overcrowding, then all three groups of citizens can enjoy the plantations; if there is no overflow, then there is no need to worry that citizens of other territories can take advantage of these benefits. At any value less than 6 - residents of the settlement will be able to pay more than 300 rubles for an additional tree. Suppose that at first one tree was planted there can be any kind of examples with local public goods: installation of street lamps, allocation of acres of land to the park, etc., the principle remains the same). At this point, the willingness to pay for the planting of trees (see pic 1.)



Pic. 1. **Optimal or balanced supply of local public goods**

is at 800 rubles, and the costs are only 300, so planting additional trees will bring significant net benefits. Similarly, for any value exceeding 6 trees (in pic 1, point A), the willingness to pay will be lower than the public costs, so it is more efficient to have fewer trees. How can the local authorities decide how many trees to plant? There are a few options. The first involves holding elections in which voters decide which programs are priority, how much to spend on local public goods. The second method allows citizens to "vote with their feet" when they move to a different location, which provides the best combination of public goods and taxes (costs). The next method is the public participation of citizens in the budget process.

A number of authors define public participation as a way to ensure citizens' rights to receive reliable information, participate in the decision-making process, etc. It is generally accepted that this is a tool to identify and take into account

the views of interested parties on the issue under discussion, ensuring the adoption of an effective management decision. In addition, public participation is the process of interaction between decision-makers and stakeholders. In our opinion, the public participation of citizens in the budgetary process should be viewed as a manifestation of the participatory economy. It seems that this approach justifies the use of public participation of citizens in the budgetary process as a tool for effective management of public finances.

In the author's opinion, in a broad sense, public participation of citizens in the budget process is the involvement of citizens in solving social and economic problems of local self-government development when implementing municipal programs by participating in their ownership and managing the local budget.

Public participation of citizens in the budget process - participatory budget (Tigan, Mark T, 2005, Cabannes. Y.2014), can be conditionally divided into two types:

1) active participation - initiative budgeting, when a citizen participates in the project directly or by voting on the allocation of budget funds (public hearings, crowdsourcing, etc.), or participates using his own means - crowdfunding, etc., the key is the manifestation of citizens' initiative;

2) passive participation - *budget for citizenry,* raising the budget awareness, including about municipal programs, services, etc. The municipal program must necessarily include public participation of citizens in the budget process (not necessarily by their own means will improve the management of public finances and create a model of social state in Russia.

Perfilieva E. V. in her work "Public participation: the theory and practice of stakeholder interaction in the development of the local community" (E. V. Perfilieva 2011) states that public participation in the budget process can take place in various forms:

• Organization of separate public hearings on issues.

• Establishing a system of regular public discussions, including in the form of civic chambers (councils).

• Participation in open parliamentary (Executive authority) hearings.

• Delegation rights to representatives for decision-making (or conducting contests or Advisory) commissions and government councils (expert, "public", etc., in "working groups", "social helpers", "advisors"), as well as their participation in considering and solving the problems.

• Independent analysis of a problem (including analysis in the form of "public examination"), proposed authorities and published.

• Separate media reports on problems (including the "interactive debate").

• Media campaign on the issues (including a regular column).

• Suggestion to the authorities of draft regulatory legal acts, programs, etc.

• Letters to the deputies and representatives of Executive authorities with appeals.

• Collect signatures on a petition to the deputies and representatives of Executive power on issues.

• Initiating and using the results of sociological surveys that reveal public opinion and the interests of voters, to influence the problem-solving power.

• The use of public reception offices, "hot lines?

• The use of legitimate rights for freedom of expression, pickets, rallies, marches, demonstrations, initiation and conducting of meetings, gatherings of citizens, publishing and distributing information materials, brochures, Newspapers, leaflets, posters, social advertising, etc.

• Handling the control and law enforcement agencies.

• Initiation and participation in court processes (including as public representatives).

• Participation of NGOs in the implementation of funded order (social order, social grants).

• The use of campaigns for elections and referenda to indirectly influence problem solving and the nature of the relationship with the government.

• Involvement of authorities in the activity of public associations, including meetings, conferences, seminars, Supervisory boards, etc. (in accordance with the laws, standards and also with the statutes of these organizations).

• Promoting the training of deputies and representatives of Executive power.

• Single action coalition (contacts, exchange of information, mutual promotion of training and coordination) of various public groups and the formation of stable coalitions when exposed to power at a separate issue.

• Crowdfunding (proactive budgeting) is the first step for participatory budgeting in Russia, which refers to people's-public funding is a collective cooperation of people (donors, investors) who voluntarily pool their money or other resources together, usually via the Internet, to support the efforts of other people (owners, creators, startups, projects) or organizations. Fundraising can serve a different purpose – assistance to victims of natural disasters, support from the fans, supporting political campaigns, financing start-up companies and start-up projects, small business and private business, creation of free software and games, profits from the joint investment, as well as subsequent control over the implementation of selected projects.

• Crowdsourcing is bringing to the solution of certain problems of innovative production activities of a wide range of people to use their creative abilities, knowledge and experience of the type of subcontract work on a voluntary basis with the use of information and communication technologies. In other words, crowdsourcing is the mobilization of resources through information technologies to solve challenges facing business, government and society in general. This term refers to the solution of any range of tasks connected with social activities, interpersonal relationships, charity. This subcategory includes such projects as "Map fire", search for missing people, raising funds for the construction of a school in your area, etc.

Public hearings involve a clear fixation discussion topics, mandatory distribution of preliminary information, the availability of documented information on the topic, drafting of the outcome document to reflect the agreement of the parties involved, and fixing the differences.

The topic of discussion at the public hearing may be any issues that affect the rights and interests of citizens and organizations in the territory, and the decision which is the responsibility of the authorities of the territory. The budget process can be discussed at any stage. How can local authorities decide how much local public goods have to be provided, what is the mechanism for determining the optimal ratio of marginal public benefits and costs? There are several options. The first is conducting elections, in which voters decide how much to spend on local public goods. The second method allows citizens to "vote with their feet" when they move to a different location, which provides the best combination of public goods and taxes. In the conditions of the federal system of power, the responsibility for the provision of public goods is distributed among federal, regional and local authorities. Oates (Oates1972) argues in his works why some public goods are provided by local authorities, rather than regional ones. Proof of the advantages and disadvantages of providing public goods at the local level:

1. Variety of demand. The system of local authorities allows residents of settlements to choose different levels of spending on public goods (parks, public safety, education, libraries). As local authorities can meet the different demand for public goods, they contribute to greater efficiency.

Therefore, if the public good has an alternative solution (the number of trees planted, lanterns, etc.), then it is more effective to realize this public good at the local level. But if the public good is strictly regulated by law, it is standardized - the choice should be made at a higher level.

2. External effects.

If households cross the boundaries of settlements in order to use the services of other local authorities, the public benefit from these services outweighs the local benefits - it is the overflow of public goods. For example, in the Murinsky rural settlement of the Vsevolozhsk district of the Leningrad region - the only one that has a metro station on its territory, citizens who reach the station, overload the selenium roads. The public benefits from roads in the population in question are greater than local benefits, this product is not local. One of the solutions to the overflow problem is the system of subsidies from higher authorities. If the municipality receives a subsidy equal to the marginal external benefit of the public good, then it makes its decision on expenditures taking into account the marginal social benefits of this product. The subsidy raises the good of the municipality to the level of marginal public goods, so the municipality increases its costs to the optimum level.

3. The influence of scale. If in the provision of public goods a large-scale effect , the local government system has relatively high production costs.

The solution of the problem of external factors can be the consolidation at the metropolitan level, in which the subordinate area is expanding, and includes all people covered by the local government policy. As a result, the development program of the territory of the capital authorities to overcome external factors will be more effective than for one municipality, if the shifts are sufficiently large in relation to the variety of demand. In this case, the advantages of the authorities of small settlements (the ability to satisfy the diverse demand for local public goods) are relatively small, and shortcomings (inefficiency associated with external effects) are relatively large.

Providing public goods at the local level will be effective if the advantages outweigh the shortcomings. In other words, provision at the local level is effective if: 1) the diversity of demand is relatively large; 2) the external effects are relatively small; 3) the scale effect is relatively small.

Thus, when developing strategic financial documents, local authorities are obliged to make decisions on the optimal volume of local public goods.

When discussing a municipal program, the following options are possible for residents to choose the number of local public goods:

Suppose that the settlement divides the cost of planting trees in equal shares between their three groups of citizens. If the marginal cost is 300 rubles, then each group pays 100 rubles for the received public good. The preferred number of trees for a particular resident is when the marginal private costs are equal to the marginal private gain. On the graph (pic 1.) the marginal private costs are represented at the level of 100 rubles. If each group of citizens pays 100 rubles, then the preferred number of trees will be 8 (in pic 1 point B). In the conditions of voting by a simple majority, the preferred size for the median group of citizens is (8 trees). In conditions of the benefit principle, citizens pay an amount (per tree) equal to its marginal benefit with the optimal amount (the optimal result is 6 trees, point A), so the landing of the optimum size receives universal support. The outcome of voting depends only on the position of the marginal benefit curve of the median voter. Voting by a simple majority turns out to be ineffective because the costs in this case for the production of the public good are divided equally among the three voting groups and for the first group the difference between willingness to pay and payment is much higher than for example in the third group ($400-100 \geq 160-100$).

Alternatively, you can distribute costs in accordance with the willingness to pay for local public goods and this approach to making local decisions is called the Lindal approach (named Eric Lindal). In accordance with which, the tax liabilities are based on the benefits derived from public goods: the more the citizen is willing to pay, the higher his tax obligations. *This thesis can be formulated regarding the financial provision of municipal programs in this way: the greater the need for local public goods, the higher the citizen's willingness to participate in the program using his own means.* Therefore, if a citizen is willing to participate in co-financing a municipal program (even a purely symbolic

amount), this already indicates the need for the created benefits, which means that the program is effective. *Public participation of citizens, initiative budgeting becomes a new tool for determining the effectiveness of municipal programs.*

Suppose, as a result of conducted hearings and polls, the authorities know the curves of the marginal benefits of citizens of a given territory. Citizens are ready to participate in the landscaping program using their own means: for example, citizens of the 1st group decided to contribute 150 rubles for the implementation of the gardening program, 90 for the second group, and 60 rubles for the third group. These costs are much lower than the willingness to pay, which makes planting 6 trees an acceptable option for everyone. Given these private costs, all three groups of citizens have a landing size that they prefer. In this case, the authority is sufficiently informed to calculate how many individuals are willing to pay for the local public good of various levels, and it sets the recommended amount to each group of citizens in accordance with their utmost willingness to pay. How does the principle of benefits in public participation work in real life? A similar question is considered for taxation, but it seems to us that citizens prefer to participate in specific social projects with a real end result. One of the problems associated with this method is that the authorities do not represent the shape of the marginal benefits curves of individual citizens, so they are not able to calculate approximate amounts for them. Moreover, there's no point for taxpayers with relatively high benefits in disclosing their willingness to pay for local public goods: if they do this, higher amounts will voluntarily be paid. Citizens with high needs will act more rationally if they hide their true preferences in the hope that someone else will pay for this public goods. In this case, the public goods cannot be produced at all.

If the municipalities do not have a correspondence in the need of public goods and budgetary security or rather, the means of the local budget and citizens is not enough to plant the optimal number of trees and subsidies should be the missing part of the financial provision of the municipal program . Recall that today in practice for the implementation of municipal programs the following resources are used: local budget funds, subsidies from a higher budget, other sources - funds of citizens, organizations.

In his works, O. Sullivan (O. Sullivan2002) gives a rather detailed analysis of the low effectiveness of the non-earmarked subsidy (the model of Filimon, Romer and Rosenthal, the "Velcro effect"), so we will only consider the option with a targeted subsidy for the implementation of the municipal program. Suppose for the improvement of the regional budget 150 rubles were allocated for planting one tree. In this case, the public goods curve will move upwards parallel to the original value by half (300: 150), MSC = MSB * the point will move to the right (pic 1, point C), so at the marginal social costs, the production of marginal public goods can increase. Or 150 rubles evenly distributed between groups of citizens for 50 rubles, which further increases the profitability of public goods, the satisfaction of citizens. The targeted and share subsidy , directed to the financial provision of municipal programs, with the condition co-financing of other economic entities (funds of citizens, enterprises) will stimulate local authorities to develop proactive budgeting, hence, to improve the effectiveness of programs. At the same time, it is necessary to abandon the use of a single subsidy, Officials can seek to save on programs for the implementation of public goods most in demand by citizens, for which they are ready to pay more, and send the remaining amounts to the programs in demand, which proves the expediency of applying a targeted, shared subsidy.

In the conditions of economic crisis and budgetary limits, when funds are diminishing, the municipal program turns out to be a means of involving people in the resolution of public problems, including the citizens' funds raising. Programs for financing local initiatives where most resources are provided by the region's budgets, partially from local budgets and citizens' funds are also involved, are remarkable examples of this practice.

Since initiative budgeting is a relatively new phenomenon in Russia (the implementation of such practices have been launched in 2007 in the form of supporting local initiatives), the projects in implementation need to be improved not only in terms of their visualization, but also in terms of delivering information on the implemented measures to citizens. Having

analyzed best regional practices (we have examined official web-sites of cities', areas', regional bodies), we came to the conclusion that initiative budgeting in Russia is at the initial development stage, but projects that had been implemented up to this day are bright examples of the necessity and usefulness of this form of budgetary policy. Several important shortcomings s must be addressed to further develop initiative budgeting.

The lack of information among citizens on the possibilities of participation in defining and distributing funds of local budgets

The lack of interest of legal entities in co-financing the projects in implementation.

The non-user friendly interface of local bodies' web sites that makes more difficult to find information about the projects in implementation.

The lack of information in the web-sites of local bodies about programs in implementation in the framework of initiative budgeting.

The lack of information of local bodies about the possibilities of participating in regional programs of supporting local initiatives.

After the examination of best practices (Best practices report 2015) of the municipal bodies referring to the implementation of initiative budgeting programs, the author elaborated a step-by-step guide of initiative budgeting for municipal bodies.

Step 1. The creation of an initiative group (public committee) and the involvement of volunteers.

Step 2. Announcements on the collection of citizens' initiatives through

- Publishing announcements on the local bodies' web sites
- Public service announcements
- Distribution of leaflets and pamphlets.

Step 3. The collection and analysis of information on the proposed initiatives. The choice of 10 best projects by the initiative group.

Step 4. Voting for the nominated projects.

- Feasibility voting
- Public votes

Step 5. Debating of the winning project

Step 6. Search of financing sources

Step 7. The implementation of the selected project.

The citizens' participation in the implementation of social projects that might become part of municipal projects (such as landscaping works) or be a stand-alone event, must become a mechanism of improving personal and public mutual trust.

The next problem in developing and introducing the instrument of initiative budgeting is to define where and how this instrument may be used in municipal bodies.

The calculation of reasonable shares of budgets in financing social and economic development programs should be based on the theory of marginal social costs and econometric modeling.

Conclusions, Proposals, Recommendations

The research has practical applicability for municipal bodies. When drawing graphs of marginal profits and costs it is possible to define the optimal pricing of public municipal goods, but it is necessary to know the citizens' opinion for that.

To conclude, the 3 conditions of an optimal pricing of the public goods are 1) it is defined at the local level 2) with citizens' involvement 3) there is a possibility of choice.

The author's position in the aspect of scientific novelty consists in singling out the public participation of citizens in the budgetary process in the derived scientific category and endowing it with distinctive features. The use of public participation of citizens in the implementation of municipal programs makes it possible to identify the optimal correlation of local public goods and public expenditures, which increases the efficiency of municipal expenditures. Public participation of citizens is becoming a new tool for determining the effectiveness of municipal programs, therefore it should be legislatively enshrined as a condition for the implementation of municipal programs. Subsidies of higher budgets allocated for the implementation of specific municipal programs also increase the effectiveness of programs, reduce private marginal costs, which increases the profitability of local public goods for citizens, and as a result, the satisfaction of citizens increases.

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CUSTOMER BEHAVIOUR IN RETAILING AND INFLUENCING FACTORS DURING THE PURCHASE IN THE CONTEXT OF OMNICHANNEL RETAILING

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Abstract. The advancing digitalization is influencing all sectors of economy. Customer behaviour has changed over the last ten years since technology and its use became part of our daily life. In this new environment, retailers must react and re-examine their strategies. The choice of certain channels for purchasing products, is a complex process and depends on many different factors like acceptance of technology, perceived security, flexibility and many others. Nowadays retailers are overthinking their strategy and looking for a combination of online and offline channels or specializing in one.

The article is showing how customer behaviour changed through influence of internet and usage of mobile devices. Customers are using different channels while gathering information, the actual purchase process and the post selling process. Retailing changed in the last decades and the success story of the internet redrafted the retailing from the classic brick-and-mortar retailers to worldwide acting and selling concerns. Nowadays for SMEs the need of an online shop is an important decision and is one of the big questions. It is difficult for companies to understand and explain channel choice for purchase of consumers.

The aim of this article is to the different motivations of consumers are having for shopping online vs brick-and-mortar shop or shopping using an omnichannel approach. The research was accomplished by a comprehensive literature review and comparison of common models in the field, comparing consumer and shopping behaviour.

In the article, it will be shown that there are many different motivations and factors, like acceptance and use of Technology to choose the channel of purchasing products, like personal innovativeness, perceived security, intrinsic and extrinsic motivation, products and many others. The theoretical and managerial implications are discussed.

The results of different studies provide converging evidence and show that online-offline channel integration lead to a competitive advantage and channel synergies rather than channel cannibalization.

Key words: *brick-and-mortar, Consumer behaviour, retail, Omnichannel, shopping motives*

JEL code: D11, Z20

Introduction

In the last decade, and especially in the last three years, the retail market in Austria has significantly changed. Causes of this change in the retail market includes increased availability and access to the internet, which is no longer limited to desktop computers; and the increasing importance of the internet in everyday life. The effect of the internet has impacted a wide range of sectors within the retail market. The internet made it possible for consumers to shop 24 hours a day and 7 days a week. Access to on-line stores is not only available within one's home but also from anywhere within wireless mobile coverage because of the development of mobile devices like smartphones and tablets.

Especially in recent years, internet based retail became an important player in the retail market. Depending on the sector internet retail has obtained a considerable market share and become a serious influence on stationary retailers.

Omnichannel retailing is a very young field and very intense researched yet. Due to these quite new developments classic brick and mortar retailers are thinking about their business model, necessary changes and following questions are raising:

- What are the effects of the growing online market on employment and taxes?
- Is the traditional brick and mortar retailer only used for showrooming?
- How are promising business models looking in future?
- Is an online shop compulsory for a physical retailer nowadays?
- How should retailers react to the changing environment?

The research was accomplished by a comprehensive literature review. The findings have direct implications for retailers interested in understanding whether and how integrating different channels affects customer.

The above-mentioned market conditions, are not only challenges to the traditional brick and mortar retailers; they also highlight the opportunities and market access that e-commence and online retail can provide to the Austrian retail market.

Analysis

The expression omnichannel is young from a academic point of view. Rigy (2011, p.4) mentioned first time the expression "Omnichannel Retailing" and defined it. He defined omnichannel retailing as an integrated sales experience that melts the advantages of physical stores with the information-rich experience of online shopping. There are various definitions in the literature of "Omnichannel Retailing" with some common findings. Many researchers see the development of omnichannel retailing as a movement started with multichannel retailing (Lazaris and Vrechopoulos 2014; Piotrowicz et al. 2014; Verhoef et al. 2015).

Verhoef et al. (2015) shows in his paper a comparison of multichannel and omnichannel Management to point out the differences.

	Multi-channel management	**Omni-channel Management**
Channel focus	Interactive channels only	Interactive and mass-communication channels
Channel scope	Retail channels: store, online website and direct marketing (catalogue)	Retail channels: store, online website, and direct marketing, mobile channels (i.e., smart phones, tablets, apps), social media, Customer touchpoints (incl. mass communication channels: TV, Radio, Print, C2C, etc.).
Separation of channels	Separate channels with no overlap	Integrated channels providing seamless retails experiences.
Brand versus channel customer relationship focus	Customer – Retails channel focus	Customer – Retail channel – Brand focus
Channel management	Per channel	Cross-channel
Objectives	Channel objectives (i.e. sales per channel: experience per channel)	Cross-channel objectives (i.e., overall retail customer experience, total sales over channels)

Verhoef et al. 2015

Verhoef et al. 2015 shows in his paper that in the past, the roles and advantages have been clear and quite well separated between the different channels. Within physical stores consumers could touch and immediately buy products. In contrast, online retailers offered good prices and a wide range of products. In his article Verhoef shows how retailing is moving from a multichannel to an omnichannel strategy. He defines multichannel as:

- Distinction between physical and online retailers
- Channels are customer contact points
- Attention for multi-channel has mainly been driven by growth of the online channels
- Limited integration of channels within firms
- Channels with one-way (TV) or two-way (Internet) communications
- Consider mainly retail channels

With the wider use of smartphones and tablets, new digital channels like mobile channels leaded to another change. With this development researchers investigated the effect of apps and mobile devices on performance like it happened couple of years before with the growth of the online channel. (Xu et al. 2014)

Omnichannel

- Driven by the development of Apps and mobile devices
- Involves more channels
- Channels are getting blurred and boarders begins to disappear (Brynjolfsson, et al. 2013)
- Channels are interchangeably and seamlessly used during search and purchase process
- Use of mobile devices in stores
- Using WIFIs in stores, giving firms the possibility to communicate with their customers
- By using interactive Apps, the boarders between channels with one-way or two-way communication are disappearing
- Interplay between channels and brands
- Broadening the scope of channels
- Further determination of channels within the online channel: Email, Displays, referral websites, affiliates (Li and Kannan, 2014) – they can facilitate one- and two-way communication

Juaneda-Ayensa et al. (2016) published the following differentiation to distinguish between multichannel and omnichannel strategy.

	Multichannel strategy	**Omnichannel strategy**
Conept	Division between the channels	Integration of all widespread channels
Degree of integration	Partial	Total
Channel scope	Retail channels store, website, and mobile channel	Retails channels: store, website, mobile channel, social media, customer touchpoints
Customer relationship focus: brand vs channel	Customer-retails channel focus	Customer-retail channel-brand focus
Objectives	Channel objectives (sales per channel, experience per channel)	All channels work together to offer a holistic customer experience
Channel management	Per channel	Cross-channel

	Management of channels and customer touchpoints geared toward optimizing the experience with each one Perceived interaction with the channel	Synergetic management of the channels and customer touchpoints geared toward optimizing the holistic experience Perceived interaction with the brand
Customers	No possibility of triggering interaction Use channels parallel	Can trigger full interaction Use channels simultaneously
Retailers	No possibility of controlling integration of all channels	Control full integration of all channels
Sales people	Do not adapt selling behaviour	Adapt selling behaviour using different arguments depending on each customer's needs and knowledge of the product.

Juaneda-Ayensa et al. (2016)

Juaneda-Ayensa et al. (2016) and Verhoef et al. (2015) are indicating a very clear and strong separation of channels with little or no overlap. These definitions and descriptions are supported by Piotrowicz et al. (2014). He defines omnichannel as a channel which aims or deliver a seamless customer experience regardless of the channel. Levy et al. (2013) introduced the expression of "omniretailing" and defined it as a coordinated multichannel offering that provides a seamless experience when using all of the retailers shopping channels. Juaneda-Ayensa et al. (2016) defined omnichannel shoppers as those shoppers who use at least two channels of the same retailer during their shopping journey.

Frasquet, et al. 2015 looked for patterns in channel usage across stages of shopping. They split the shopping process up into three stages: search, purchase and post-sales.

Research framework based on TAM Model (Davis, 1989) with the support of the Motivational Model (Deci and Ryan, 1985). This model distinguishes between extrinsic and intrinsic motivation. It is intended by the authors to explain channel usage with transaction cost economics to explain different channel usage at each shopping stage.

To capture the extrinsic motivation the perceived usefulness was defined as main influencing factor. They hypothesize that a higher level of perceived usefulness is positively associated to the use of the online channel (vs. offline channels) for search/purchase/post-sales. Since searching in the Internet does usually not require disclosing personal and financial data they don't expect an influence in this case.

Another factor to be considered is time pressure. Previous researches reveals that consumers which considered to be consumers under time pressure, perceive online shopping to be a time saving channel. (Alreck and Settle, 2002). There is a tendency that consumers prefer to choose an online shop when they are pressed by time during the purchasing.

Frasquet et al (2015) belief that performing after-sales activities online is not connected to time saving since there is usually a delay in the answer (product exchange, product repair).

In fact, researches show, that consumers rarely report using the internet to save time because the delivery takes too much time. (Alreck et al., 2009).

This is supported by a research of Chatterjee (2010), who found that consumers tend to purchase offline if they are having high waiting costs.

Capturing the intrinsic motivation was achieved by the perceived ease-of-use construct. The perceived enjoyment is another important factor for the intrinsic motivation (Teo et al. 1999, Venkatesh 2000). Another influencing factor for the intrinsic motivation was the consumer involvement with the product category.

Frasquet et al. (2015) contribute with their study to the current literature on multichannel consumer behaviour. The scope of the findings has an impact in three different ways:

1. Channel choice is explained by different variables at each of the three phases of the purchase process (search, purchase and post-sales).
2. Product category affects the usage of the online versus offline channels at each stage.
3. Full characterization of channel-based segments is provided.

One of the main conclusion is, that variables investigated influence channel usage differently at each purchase stage and for each product category. There is only one variable explaining a higher use of online channels across the entire shopping process (search, purchase and post-sales) and for both categories: Product involvement. Frasquet et al (2015) explain this finding with a higher shopping frequency and familiarity with the channel. A more focused view on the specific stage during the shopping process shows that during information search, product involvement and usefulness explain a higher use of online channels. Furthermore, a hedonic orientation shows a lower use of online channels during the information search. For the actual purchase the common variables are the same as in the case of search: product involvement and usefulness. In post-sales only product involvement appears in both product categories (apparel and electronics).

Another interesting conclusion in the paper of Frasquet et al. is that multichannel shoppers are not a homogenous group. They identified two polarised segments:

- Online shopper
- Offline shopper

In between this two segments there are three segments of cross-channel shoppers. Comparing the two categories apparel and electronics the group of offline shoppers is bigger within the apparel shoppers.

There is another very interesting finding about choice of channel and changing patterns:

> *"In both product categories, we can confirm the trend of searching online and purchasing offline (webrooming), but we do not get strong support for the purchase online-collect at the store behaviour (click-and-collect) or search offline-purchase online (showrooming)."*

The segmentation of consumers is a widely-used approach for explaining customer's behaviours. It is shown by several researches that (e.g. Brengman et al. 2005) customers are not a homogeneous group and a segmentation of consumers helps to understand customer behaviour. The methods of segmentation differ from paper to paper.

Davis (1989) describes with the TAM model as the two main determinants of acceptance of a technology usefulness and ease of use.

Based on the TAM model Davis and Venkatesh (2000) suggested additional variables. This development of the TAM model should improve the understanding of consumer's behaviour.

A further development of the TAM model was published 2008 by Venkatesh and Bala. The focus in this model is more towards evaluation targeted intervention. This model includes six new factors which determining the influence of acceptance.

Venkatesh et. al analysed 2003 eight prominent models in the field of information technology acceptance:

- The theory of reasoned action
- The technology acceptance model

- The motivational model
- The theory of planned behaviour
- Model combining the technology acceptance model and the theory of planned behaviour
- Model of PC utilization
- Model innovation diffusion theory
- The social cognitive Theory

The so-called research-shopper phenomenon was defined by Verhoef et al. (2007). It describes the tendency to use one channel for research and the other channel for the actual purchase process. The research shows the lack of the internet channel to convert searches into sales. In this paper, there is an overview over a few studies which are examined search and purchase decisions jointly.

Since this development is a quite new one (Neslin et al., 2006) there is a need for studies considering channel choice decisions for search and purchase in a multichannel environment.

Verhoef et al. (2015) introduced a model for a two-channel case. The objective of his model is to understand the channel choice for searching and purchasing. Verhoef gives us three explanations for the research-shopper phenomenon: Attribute-based decision-making, lack of channel lock-in, cross-channel synergy

Frasquet et al. (2015) summarize their findings and giving some recommendations for retailers if they want consumer accomplish their search for products online: Improving the usefulness of the website, provide value-adds information on the product, allow easy comparison of alternatives.

It is clearly shown in the research that searching online is driven by extrinsic motivation. If consumers should be encouraged to use online and offline channel, retailers should make the search process swift and easy ant the store and make an enjoyable shopping experience.

For online retailers Frasquet et al. (2015) having the following suggestions to not lose customers between search and purchase stage. The suggestions differ from apparel to electronics:

Apparel:

- Promoting of hedonic aspect of shopping online
- Increasing enjoyment
- Enhancing the sensory appeal of the website (trends, videos)

Electronics:

- Increasing perceived usefulness
- Increasing perceived security of the website
- Providing full information of products
- Reviews by other customers
- Expert advice
- Useful Apps
- Tips to reach higher performance

Jueandeda-Ayensa et al. (2016) did a research which aimed to find out the factors that influence omnichannel consumers behaviour through their acceptance of new technologies. To this end the authors based the research on the UTAUT2 model (Venkatesh et al. 2012) and two additional factors: personal innovativeness and perceived security.

The findings show that the main impulse for purchasing in an omnichannel environment are personal innovativeness, effort expectancy and performance expectancy. These findings are contrary to other researches (Verhoef, 2015) which found an influence by habit, hedonic motivation, social influence and perceived security.

The strongest predictor for purchasing in a omnichannel context is personal innovativeness. Consumers which are more innovative can be attracted by new technologies.

The second strongest predictor of purchase intention in the omnichannel context is expectancy effort. An explanation could be that omnichannel shoppers are more task oriented and using different channels to look for more convenience.

Pauwels and Neslin (2015) examined the impact of channel additions. They looked at the performance of a retailer with existing online and catalogue business by opening an offline store. They show that store introduction cannibalizes catalogue sales but has much less impact on internet sales. Adding a store is leading to the "availability effect" and this is accompanied by increased returns and exchanges on the one hand and net increase in purchase frequency across channels resulting in higher overall revenues.

Similar results were shown by Cao and Li (2015) with a data analyse of 71 U.S. retail firms. They show that a cross-channel integration has a positive influence on sales growth. Another finding is that this positive influence is weakened if companies having a strong developed online channel or physical store presence.

For many retailers, the development in the field of mobile devices and Apps results in a broadening of their channels. Wang et al. (2015) examined the effect of mobile usage on customer purchase behaviour. The importance of mobile channels is fast increasing and will have a severe influence on the whole retailing. Their findings are that mobile channel usage is affecting shopping behaviour across channels. Mobile is in this paper most relevant in the search phase.

Piotrowicz et al. 2014 had a different approach to research the development towards omnichannel retailing.

They established group discussion covering the following topics: Theme role of information technology in retail, new business models, the future role of traditional stores as e-commerce advances

The group discussions were made during an academic conference and a workshop with leading retailers. In both cases participants were treated as focus groups.

The findings from the group discussions suggest that the following areas are important:

Channel integration is a main issue. It is shown that retailers often think of separate channels which are managed by different people. This leads to the fact that a channel integration is less seamless and efficient. This could lead to the fact that in extreme cases two channels from the same retailer compete directly.

The increased use of mobile devices makes it much easier for consumers to access product information from any point and at any time. This development makes the balance between retailers and consumers more even due to easier access to information. Bar code scanning is nowadays a quite common practice.

Nowadays consumers are producing their own "media content" by sharing photos and videos. One consequence is that consumers can share their experience during their purchase process at each stage and at any time. This fact and the fact the many people are implementing social media as extension of their private life on a daily base, this opens for retailers an additional sales channel, the so called social commerce. (Piotrowicz et al. 2014)

Changing role of the physical brick-and-mortar store is as per experts a possible development for the next years. Piotrowicz et al. (2014) see a possible future for physical stores in a "hub". That means they could change to a focal point which integrates all sales channels. The researchers found out that both groups (retailers and scientist) are convinced that customers can accept an open and helpful customization. If customization is ending up with pushy and misleading information customer more likely reject it. Another danger of digitalization experts see in digital exclusion. This means that special offers and prices are only available for people which have access to IT and dealing with it quite frequently.

One of the main findings in the paper shows that experts see the need of the supply chain redesign as key issue in channel integration. Physical stores are "hub" which would integrate all sales channels. By redesigning the supply chain some issues like inventory management, returns, delivery options, reverse flows, product availability should be addressed.

Conclusions

The more consumers know about a product, the more the use online as the main channel in the entire purchase process (Frasquet et al. 2015). That brings the importance of innovation to a new level. It is to assume that innovative products combined with high degree of mechanization will bring consumers more to physical shops.

Offline shoppers are showing lower perception in usefulness and ease-to-use of the Internet (Frasquet, et al. 2015). The consequence of these findings could be that soon the group of consumers with little experience and little interest in the Internet will get smaller and smaller. And generations with consumers which were grown up with the Internet will have less issues in the field of usefulness and ease-to-use of the Internet. This could lead to a further growing of the online channel. This could lead that the present tendency of searching online and purchasing offline (webrooming) will be reversed in the future.

For brick and mortar retailers an omnichannel integration is in different ways possible. Integration of technology in the physical shop can be one step to this goal. In this case, prior conditions must be fulfilled to succeed in this change. Integrated technology in the last corner of the shop or staff which is not willing to use new devices like tablets or touchscreens will lead to very difficult implementation of these steps (Piotrowicz et al. 2014). The limitation of goods in a physical store is evident and leads to the fact that customers are leaving the shop as their preferred product is not available. The integrated possibility of ordering the missing product with an option of delivery into the shop or back home can give the possibility of finalizing the customers shopping with sales. Increase store offering with the help of technology and different channels, physical retailers can play an important role in an omnichannel retailing environment.

A key issue for brick and mortar retailers will be the redesign of the supply chain (Piotrowicz, et al. 2014). The availability of the right products at the right team will be one of the most important success factors for physical retailers. Information technology can help with this issue like installing integrated NOS-systems (never out of stock) and addressing issues like returns, delivery options, reverse flows and inventory management across channels. (Piotrowicz, 2014).

One of the future roles of physical retailer could be as "hub" (Piotrowicz, 2014). This gives retailers the possibility something what another channel can't offer. An integration of almost all possible channels in their shops.

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DISTRIBUTED PROFILE OF TYPICAL USER BEHAVIOR IN A MULTI-SYSTEM ENVIRONMENT

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Abstract. Information systems (ISs) of large organisations are constantly becoming more complex. As a result, it is becoming extremely difficult to secure against internal threats and safeguard sensitive data in such a multi-system environment. There is a need for a common centralised data protection platform. One way to defend against internal threats using intelligent algorithms is Anomaly Activity Detection (AAD). To gain benefits of AAD systems and avoid their typical problems, we have developed our own *AAD framework*, which is embedded into the IS at the application level of the OSI model. To solve the problems associated with the growth of the number of information systems, an extension of common user behaviour profile to a distributed one has been developed within the framework of the research. One user has a common profile for all ISs of a corporate information network; as a result, the costs of implementing, maintaining and using the abnormal behaviour detection system are significantly reduced. At the same time, there is a cumulative effect when the amount of data about the user behaviour increases due to their receipt from all target ISs, which gives improvement in the efficiency of such a global profile. The paper proposes three approaches to building distributed profiles of user behaviour.

Key words: *Anomaly Activity Detection, distributed profile of user behaviour, Markov chain*, *multi-system environment*

JEL code: M15

Introduction

The information systems (ISs) of large organisations are constantly becoming more complicated due to the increasing volume of data and the number of tasks to be solved. In the course of their development, state, private and international corporate structures create new internal and external subsystems and change the existing elements of their ISs. As a consequence, ensuring protection from internal threats (theft of sensitive data, malicious exploitation of services, subversive activities of insiders and others) becomes a challenge in such an environment. For each subsystem, various means are usually implemented to carry out standard security measures that are incompatible with each other. Research (US and European Organizations, 2016) demonstrates that there is a need for a single platform to protect against internal threats because existing solutions cannot fully ensure it.

Research Results and Discussion

1. The Problem of IS Internal Threats

Internal threats in multi-system environments of information systems of large organisations are one of the most critical issues in the field of information security. The complexity of information systems generates a large number of possible ways of invading them both from outside and inside. Protection against internal intrusion in systems that deal with sensitive, financial or state information is of great importance.

Electronic means of authentication do not guarantee an unmistakable determination of who is currently working with the system. If during the login to the system the person **B** uses the login and password of the person **A**, for the system he will be the person **A**. Stealing a password or, for example, a physical key fob of hardware authentication, can turn a stranger into a trusted user endowed with certain rights and powers in the system.

According to the results (Ponemon Institute, 2017) of the analysis of intrusion statistics (237 companies were surveyed), in 2016 by the number of attacks the invasions of the type "Malicious insiders" were among the ten most common attacks (see Fig. 1).

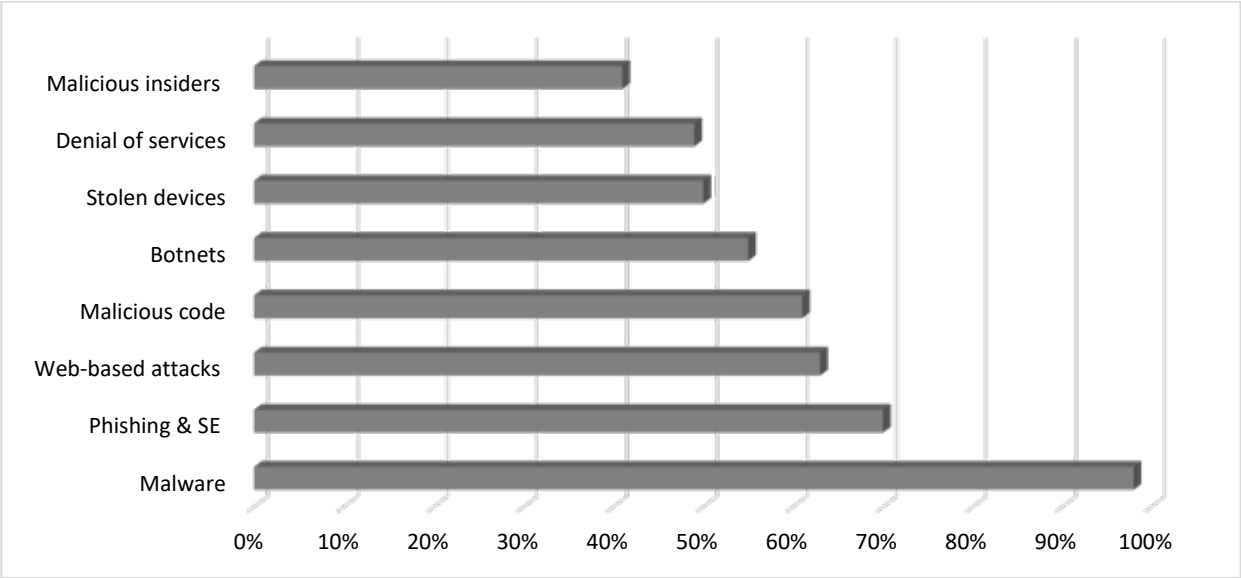

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Fig. 1. **The most common types of attacks experienced by companies**

At the same time, in terms of financial losses, these incidents cause the greatest damage among all types of attacks (see Fig. 2).

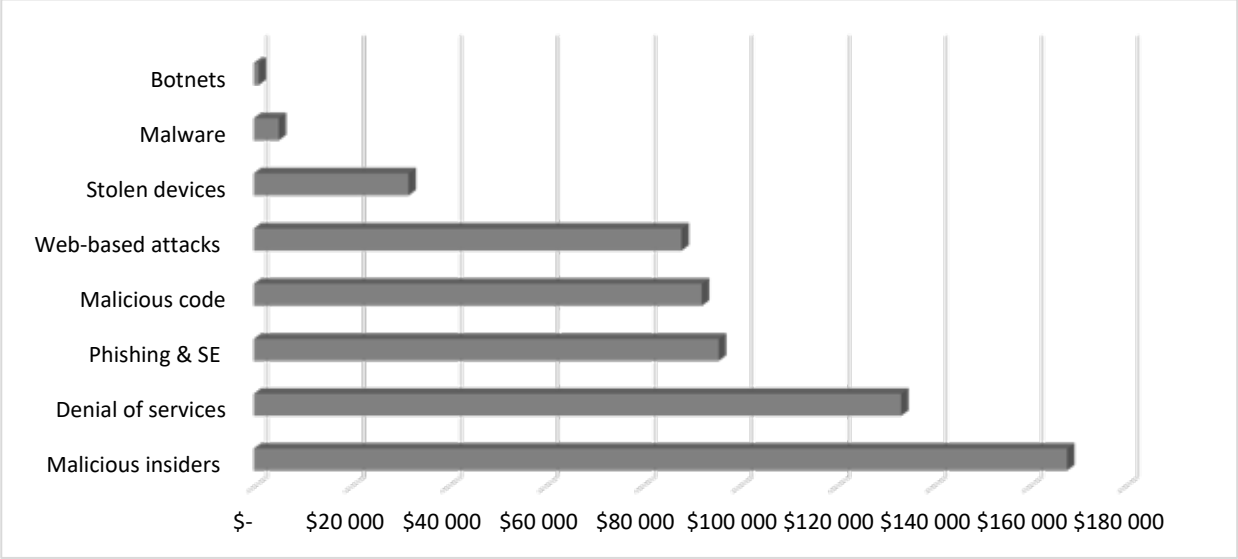

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Fig. 2. **Average cost per attack type**

By average detection and elimination time, these attacks also take first place. In this case, the longer the attack remains undetected, or the longer it is not prevented, the more it ultimately costs the company (see Fig. 3).

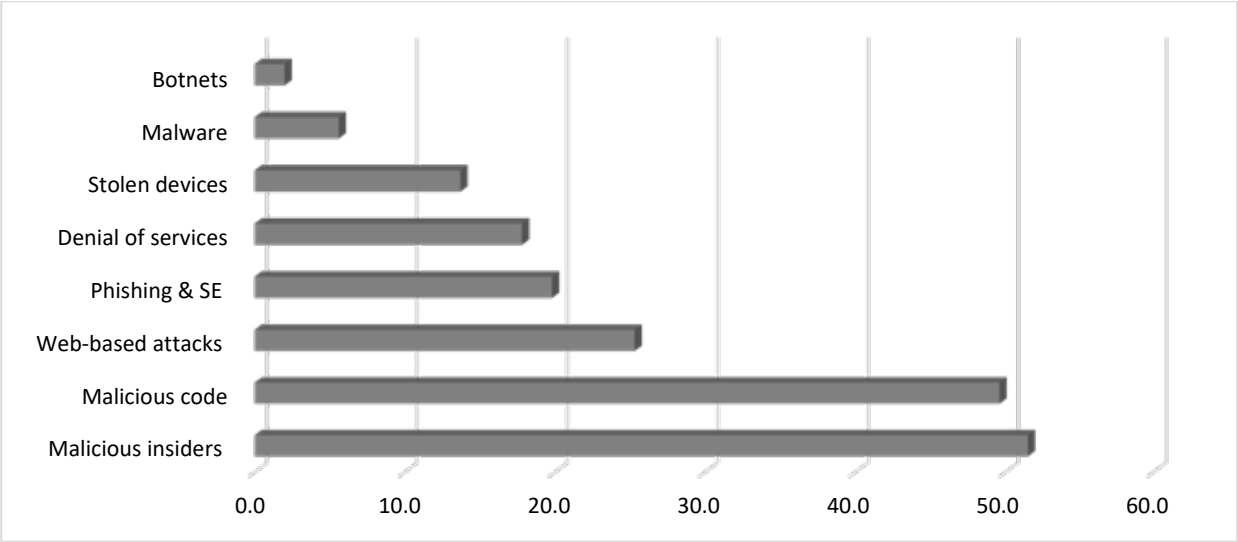

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Fig. 3. **Number of days to resolve an attack**

For example, in 2016, a hacker attack was committed against the Central Bank of Bangladesh; as a result, 850 million dollars were transferred from its accounts, 81 of which were not returned (Quadir, S., 2016). According to the results of investigation (Shevchenko, S., 2017), it was found out that the invasion was initiated by a staff member who introduced malicious software into the internal system of the bank. Then for a while malicious software collected all the data about the activity of employees. The Trojan also changed the SWIFT module code of the bank server. On the basis of the information collected, the attack itself was carried out.

2. Ways to Prevent Internal Invasions

One of the solutions to this problem is to apply adaptive methods of user behaviour analysis using intelligent algorithms (Patcha, A., & Jung-Min P., 2007). In this case, not the data entered by the person, but his behavioural patterns, personal characteristics of his behaviour in the target IS are analysed. This approach is very flexible, as it allows detecting new attacks immediately, without waiting for the updates of database description of new intrusion methods. Such an approach is called Anomaly Activity Detection (AAD) (Lee, W., & Salvatore J. S., 1998). In general, the AAD method builds a profile (model) of a typical user behaviour based on historical behaviour data or expert information. Then, at the operational stage, the current activity of the user is compared to the constructed profile (model) of behaviour. If the current behaviour of the user differs from the typical behaviour by more than a set value, one can speak about the detection of suspicious activity. Perhaps, another (malicious) person works under his account, or the user encounters technical problems, or the user, really, embodies plans that can threaten the system or data.

Based on this approach, we have developed our own solution called the *AAD framework*. To take advantage of AAD systems and avoid their typical problems, we have developed the *AAD framework* system (Osipovs, P. & Borisov, A., 2012),(Osipov, P. & Mrochko, A., & Borisov, A., 2014) that connects to the target IS at the application layer of the OSI model and abstracts from the complexities and details of the internal implementation of the target IS. The User Behaviour Profile (UBP) has been constructed using the Markov chain, which allows us to apply a well-designed mathematical tool for effective interaction with the profile.

For example, let us consider the process of building a user behaviour profile in a particular information system. Fig. 4 demonstrates an example of a user interface element for which a user behaviour profile is constructed. It is typical for a person to follow a monotonous sequence of clicks on controls when performing daily routine tasks in the system. In the

case under consideration, let us suppose that with slight deviations a user works with the system in approximately the same mode every day.

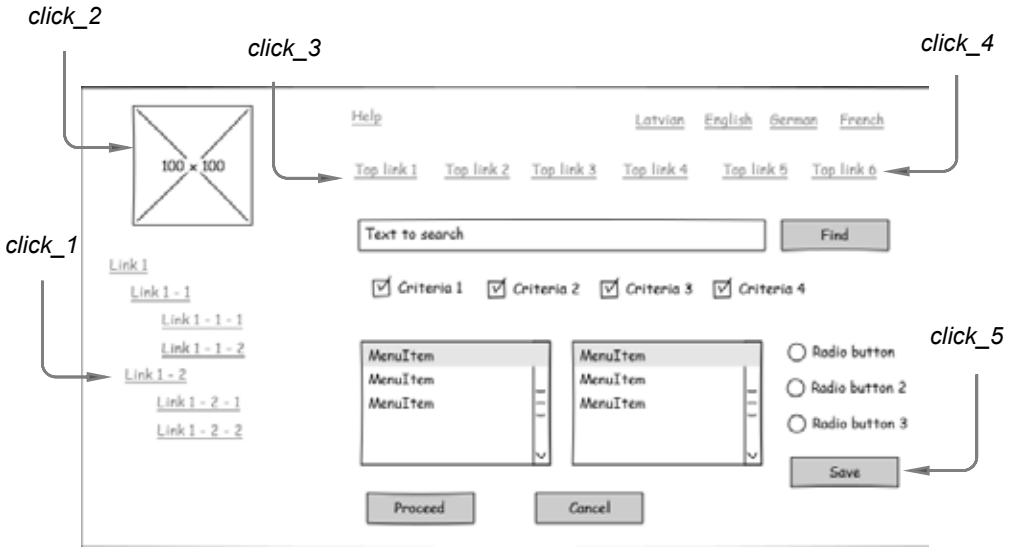

Fig. 4. **Sequence of user actions**

During the learning process, our system receives a sequence of user queries to the system from his primary login to the last logout command. Based on these data, a vector of user actions is constructed within the framework of the working session. There can be many such vectors, and each is used to train (construct) one personal profile of the user behaviour in the system.

Using the window of the given width *w*, the learning algorithm reads the elements of the vector and constructs a set of states, each consists of elements *w* (see Fig. 5). Each of the states differs from the previous one only in the initial and final element, i.e., similar to the shingles algorithm (Cooper, J.W. & Anni R.C., & Brown, E.W., 2002), states overlap.

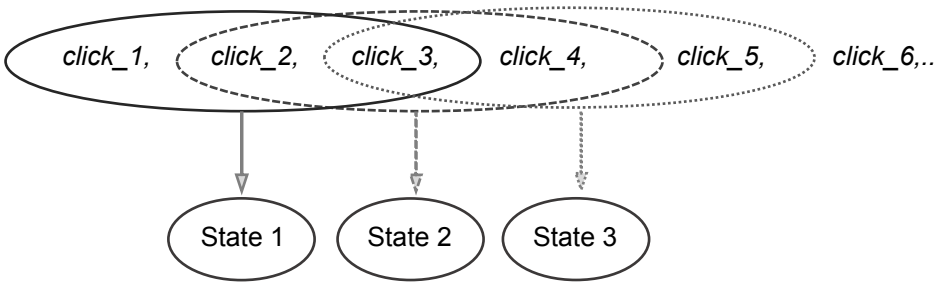

Fig. 5. **Converting queries to states**

Further, all the obtained states are combined into a graph. The probabilities of transitions among them are calculated depending on the frequency of occurrence of each state in the history of user behaviour. The more often a user passes through a certain set of elements, the more likely the transition takes place over the corresponding arc in the graph of his profile. Fig. 6 demonstrates an example of the created graph of the profile based on three possible states obtained as a result of training on five queries made to the system (the transition probabilities are of illustrative nature).

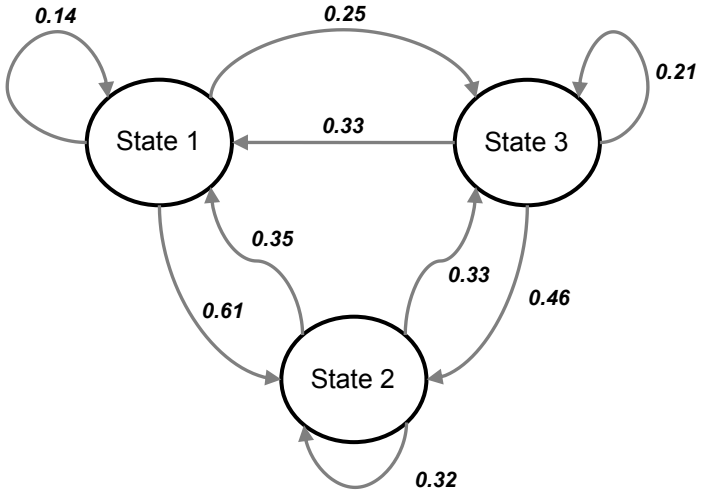

Fig. 6. **The graph of behaviour profile states**

This type of system is now being successfully implemented in several large ISs. Behaviour profiles for various user roles are trained and then used in real time to assess the level of anomaly of each user action in the system. Nevertheless, this approach to the profile construction organisation and application has faced the problem of working in multi-system environments.

3. Distributed Behaviour Profile

In the modern world, Corporate Information Networks (CINs) are formed by a large number of information systems. The complexity of architectures of such multi-system environments is usually explained by historical processes of their formation. Systems can be isolated from each other, integrated in different ways, interact directly or indirectly, etc. In any case, only the joint operation of all subsystems of the CIN allows the company to solve the whole spectrum of its IT tasks.

To ensure the security of the CIN from internal threats, each system entering the network will need its own analysis and alerting subsystem to inform security services about the incidents occurred. Therefore, the construction of user behaviour profiles, their monitoring and analysis of results are carried out separately for each system. As a result, even within the framework of a common parent organisation, the costs of protection measures increase depending on the number of target ISs.

4. Centralised Monitoring

To solve this problem, the concept of a Distributed Personal Adaptive User Behaviour Profile or Distributed Anomaly Activity Detection (DAAD) is introduced in the paper. Under this approach, one user has one common profile for all (or part) of ISs owned by an organisation. Thus, the effect of centralised control is achieved, and the costs related to the implementation, support and use of the abnormal behaviour detection system are reduced. There is also information cumulative effect, when the amount of data about the user behaviour increases due to data collection from all ISs and through the use of data mining methods (allow finding hidden patterns, in fact, new data). As a result, the efficiency of AAD is increasing. In the case of centralised monitoring, information from all ISs enters a common monitoring system, which allows more effectively analysing the overall situation and swiftly responding to incidents in all target ISs.

5. Variants of Distributed Profile

The structure of the distributed profile can be organised in various ways depending on the requirements in each individual case. We have identified three possible variants of the distributed profile:

1. The profile consists of several sub-profiles, one for each IS;
2. The profile consists of several disjoint graphs, one for each IS;
3. The profile consists of one graph, which takes into account both the transitions within one IS and the transitions among ISs. Under this approach, it will be necessary to solve the problem of loss of synchronisation regarding the arrival of data on the transition time. For example, it is possible to use logical clock common for all ISs (Lamport, L., 1978), (Fidge, C. J., 1987).

The choice of the approach used (and the architecture of AAD) is justified by the specifics of the multi-system environment. It is possible to use one of the variants above, as well as the combination of several structures of profile construction within the framework of the CIN.

The features of the distributed profile construction variants are further described in the paper. The correct choice of the distributed profile structure determines the efficiency of detecting abnormal user activity.

Case 1: Distributed Behaviour Profile with Isolated Sub-profiles

In the case where security is required in systems in which the user activity is not interconnected in any way, the need to combine the graphs of the profiles of each system into one common graph does not arise (see Fig. 7). In this case, the user profile has several sub-profiles in the CIN.

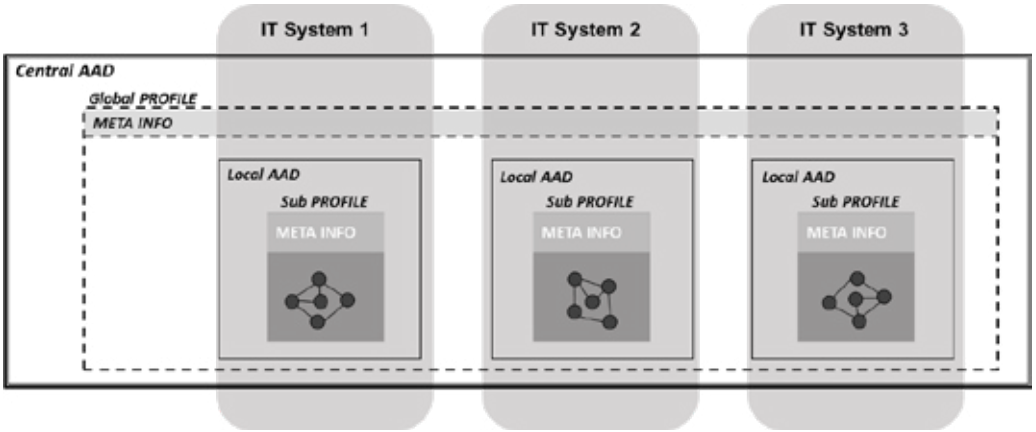

Fig. 7. **Isolated behaviour profiles**

Differences in the structure and purpose of ISs cause difference in patterns of user behaviour. In this case, for a single user, within each IS a separate behaviour sub-profile is implemented. All the created sub-profiles are isolated and independent of each other, as well as are united only by common metadata and the security alert interface, which form the global distributed profile of the CIN level. This allows partially reducing the costs of the implementation process and subsequent monitoring of user activity.

Using this approach, the global profile does not contain any graph of behaviour, but contains sub-profiles that are trained, updated, and operated independently of each other in the corresponding IS. When a query is made to assess the suspiciousness level of the actual user action in the IS_1 system, the analysis is performed within the local sub-profile of the IS_1 system, without going up to the level of the global CIN profile. However, if it is necessary to obtain a comprehensive assessment of the user suspiciousness at the CIN level, the general profile requests the assessment of suspiciousness of user of each sub-profile and returns the generalised result. To improve performance, the global profile caches the required information for all sub-profiles.

The central profile repository stores only meta-information of global profiles and links to sub-profiles. The graphs, in their turn, are part of the sub-profile structure and are stored in the corresponding sub-systems.

Case 2: Distributed Behaviour Profile with Isolated Graphs

If the target systems are similar in structure but differ in the tasks which are solved by the user, it is more appropriate to use the second type of architecture (see Fig. 8).

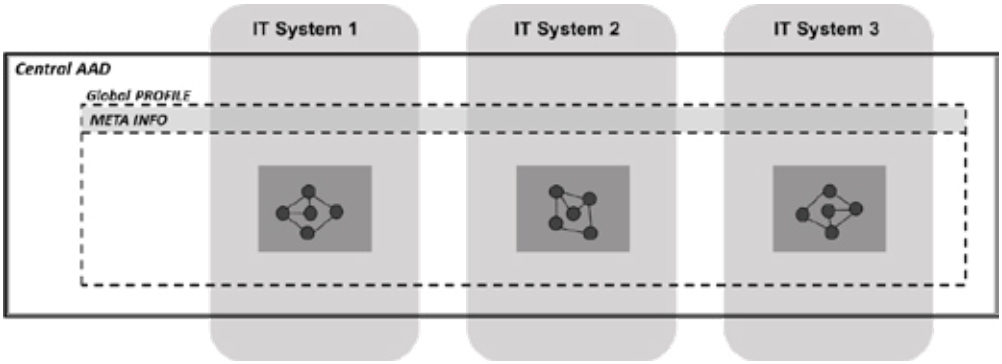

Fig. 8. **Distributed behaviour profile with isolated graphs**

In this case, in all ISs the user activity is evaluated using an overall profile. However, as a result of major differences in the purpose of the systems, to describe the user behaviour for each IS its own sub-graph is automatically created within the general graph. Each of these sub-graphs does not intersect with other sub-graphs that are responsible for describing the user behaviour in other systems.

Unlike the first scenario, the global activity profile of each user for all systems contains only graphs. Global profiles are stored centrally, in a shared repository. The analysis of the actual user activity for all systems is performed by a single AAD service using a single and local repository with respect to the service. However, user behaviour is still analysed for each system separately. It is still possible to obtain estimates of suspicious user actions for each system in particular and for the CIN in general.

Case 3: Distributed Behaviour Profile with a General Graph

The third scenario envisages that the CIN systems are aimed at solving interrelated tasks; in other words, tasks in which data or performed user actions are directly or indirectly interrelated. In this case, the user activity in all systems forms a common array of data to create the user activity profile. Fig. 9 demonstrates how the activity in the two systems is used to train the global user profile.

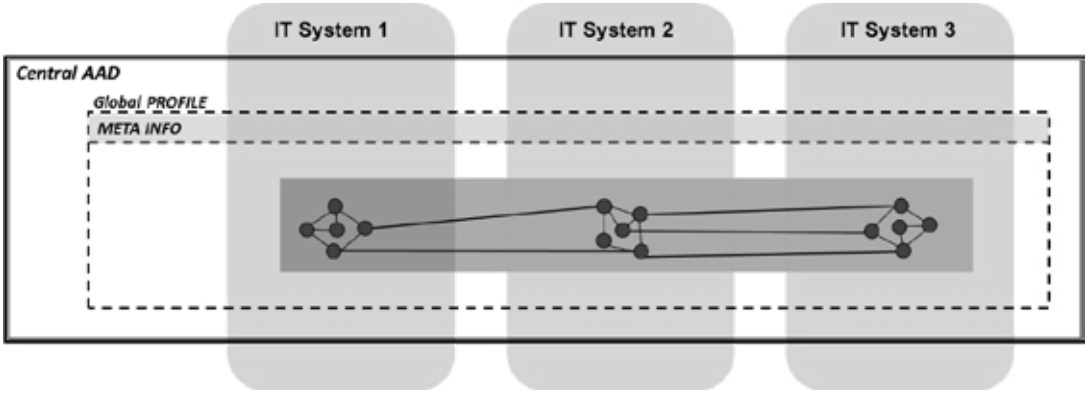

Fig. 9. **Distributed behaviour profile with a general graph**

The central profile repository stores, processes, and uses global profiles. Each profile stores graphs that envisage transitions not only within the same system but also among systems. Thus, it can be said that a profile stores one global graph relative to all CIN systems.

Under this approach, there is maximum effect of centralised control produced within the common system, since all processes associated with the detection of abnormal activity occur within one host. In this case, the aggregate of resources required for a security system will be minimal in comparison with their number necessary for the implementation of the first type of scenario. The evaluation of user suspiciousness makes sense only for the entire graph, i.e., for the CIN as a whole rather than for each system separately. In turn, the evaluation of a single user action is performed centrally in the context of the global user profile.

6. Synchronisation of User Action Sequence in Scenario 3

The most significant difference of the third type from the first two scenarios is that the user actions in all protected systems are collected together in one graph. It is important to remember that systems can be located at a considerable distance from each other in terms of both space and network infrastructure. The reasons for such delays are different speed in separate fragments of the network, the presence of routers, firewalls, and unpredictable processing time of user actions in an individual information system. This will inevitably lead to violations of the time sequence of incoming events. In the AAD system developed by the authors of the present paper, this sequence is of high importance. Violation of the sequence of actions in the vector of user actions generates new false states, which in reality do not exist. This, in turn, will lead to the formation of incorrect transitions, and, as a result, – to the occurrence of false alarms.

Fig. 10 shows the formation of the violated vector of user actions in the absence of measures of synchronisation of incoming data on user actions in different systems. The order of the user actions is indicated by the index a. Then, for example, if the user performs the actions first in IS_1, then in IS_2, then again in IS_1, then in IS_3 and, finally, again in IS_1, taking into account the delays in the receipt of information from IS_2, the information about the user actions in the system will arrive later, which will cause the formation of an incorrect query vector: a_1, a_5, a_8, a_2, a_3, a_4, a_6, and a_7.

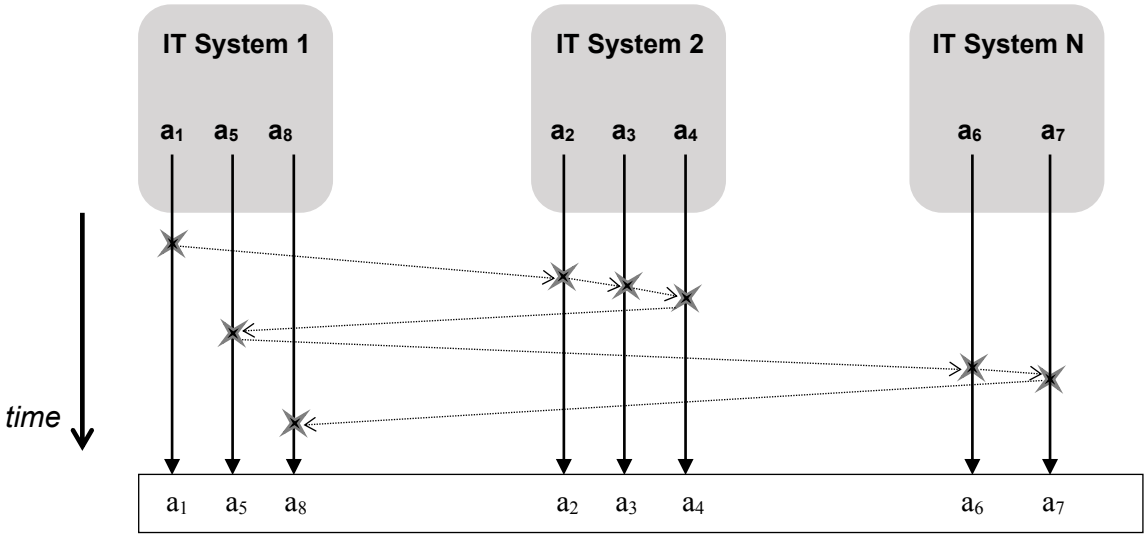

Fig. 10. **Violated order of user actions in the formation of the vector of actions**

To restore the sequence of certain actions, queries, events in distributed systems, the Lamport logical clock 0 or the vector clock 0 is usually used. However, in our case, these approaches are difficult to use, since there is no possibility to construct a causal chain of all possible sequences of actions. Instead, it is proposed to form a vector of user actions not sequentially, but taking into account the timestamps of each action. Consequently, each user action when sending an alert is provided with a timestamp, the time of which is synchronised across all ISs. When an alert arrives to the server of AAD

system, such an event is added not to the end of the vector of user actions but before such a user action so as not to violate the sequence of timestamps of actions (see Fig. 11).

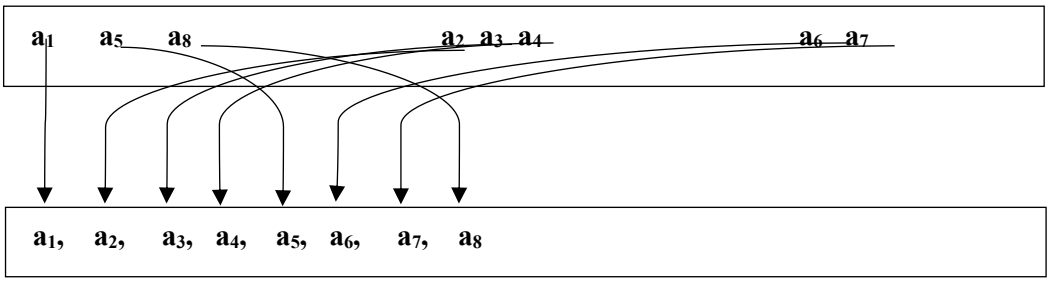

Fig. 11. **The maintained order of user actions in the formation of the vector of actions**

Consequently, the resulting vector of actions displays the sequence of actions performed by the user in the protected systems.

Conclusion

1. The article has considered the approach to protecting sensitive information in the CIN from internal threats emanating from users. The concept of a distributed behaviour profile has been introduced to detect abnormal user activity. The importance of protecting sensitive data and services has been demonstrated. The article has also provided the description of the created AAD system, which analyses the history of user behaviour, builds a model of typical user behaviour, and then uses it to detect atypical activity.
2. One of the development directions of AAD is the idea of transition from a peer-to-peer profile to a distributed one. Such a profile is aimed at more efficient protection of directly non-connected information systems, in which the user can work simultaneously within the scope of his professional activities. The transition to a distributed profile requires the monitoring system to become more complex, but at the same time it solves the crucial problems inherent in the original peer-to-peer AAD. The transition to a distributed profile also reduces the costs of acquiring, implementing and monitoring of CINs in many systems. The detection of abnormal behaviour in various information systems becomes a homogeneous process.
3. Systematisation of scenarios of the application of distributed profiles, description of characteristics of the relevant architectures, as well as functional features can be considered not only from the perspective of our AAD based on the Markov chains but also from the perspective of alternative solutions.

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ACKNOWLEDGEMENTS

The present research has received funding from the research project “Competence Centre of Information and Communication Technologies” of the EU Structural Funds, contract No. 1.2.1.1/16/A/007 signed between the IT Competence Centre and the Central Finance and Contracting Agency, Research No. 1.5 “Adaptation of Method for Identification of Suspicious Activities of IT System Users to Conditions Similar to Real Environment”.

CAUSES AND CONSEQUENCES OF SYSTEMIC RISK IN RELATION TO LATVIA

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Abstract. One of the main lessons learned from the last financial crisis is the limited understanding of systemic risk and it's functioning that led to unprecedented losses by market and regulators. Governments were forced to bailout or inject huge sums of money sometimes in form of guarantees that significantly increased the sovereign risk. Since then many academics, regulators and professionals alike have committed in closing this gap.

The analysis of the paper is conducted by literature survey as well as regulator's documentation and market analysis.

First this paper analyses the various definitions of systemic risks and systemic events; and its implications in relation to Latvia as small open economy where different status quo persists than the large G8 economies. Afterwards paper develops cause identifier with distinct agents (banks/financial institutions, depositors, the regulator, market itself). The final part of paper deals with consequences of systemic risk in form of fire sales, deterioration of value of balance sheet as well as off-balance sheet positions, loss in confidence that turns into higher interest rates, market freezes that have the ability to slow down the whole economy, broken interbank linkages and shadow banking expansion.

Causes and consequences are analysed in relation to situation in Latvia during 2007-2013 and several causes like asset bubbles (housing market), deposit insurance, limited liability by financial institutions and moral hazard problems to name a few are identified.

Key words: *systemic risk, financial institutions, regulation, financial crisis*

JEL code: G01, G21, G28

Introduction

Since the last global financial crisis systemic risk has emerged as one of the main risk that were not fully accounted for and investigated that lead to unprecedented losses not just by banking sector but the whole global economy. Even though Schuler and Schroder already in 2003 stated that *systemic risk is one of the main reason why banks are regulated and supervised* (Schüler & Schröder 2003). Besides, evaluation and mitigation of systemic risk is of particular importance in Europe as financial institutions being in distress are usually bailed out (Schwaab, Koopman and Lucas, 2011) by taxpayers money instead of allowed to default and here the problem of moral hazard emerges.

Even though the systemic risk has been analysed in relation to the large economies with developed financial markets, studies in field of systemic risk in small open economies with developing financial markets are still scarce. Besides to properly evaluate the systemic risk the equity market must be very liquid according to Black (Black et al. 2016b) while equity markets in Latvia are far from being very liquid. Another characteristic of Latvia's market is its strong linkages to Nordic countries. Even research conducted in 2010 proves that markets in Baltics and Nordic region are much interconnected without proper diversification and that few number of large banks dominate (Allen, Babus and Carletti, 2010).

Therefore, the **research question** of this study is – what is systemic risk and what are its causes and consequences thereafter in relation to Latvia as small open economy. The **problem** of this study emerged as – what are causes and consequences of systemic risk and which of them are prevalent in Latvia. It is very important to be able to identify these causes in order to limit or at least control them.

The **aim** of this study is to develop cause identifier by agents and test which are relevant and prevalent in Latvia as well as identify consequences of systemic risk. **Tasks** of this study are as follows: extensive literature and regulator's documentation review to develop identifier, a market analysis done to identify and validate which causes are relevant to Latvia during years 2007-2013. **Methodology** - if cause is identified as prevalent then it is explained in the last column of the table. The causes are differentiated by agents (financial institutions, depositors, the regulator and market). The agents have different goals from profit maximizers (private entities) to social benefits maximizators (the regulator in Latvia – Financial and Capital Markets Commission – "FCMC") – this creates fundamental differences in needs and actions. The causes in market are the ones that do not have a specific agent but are still very relevant and significant.

The novelty and topicality of this study relies on the fact that this study includes various sources and consequences of systemic risk in a single study as well as these causes and consequences are analysed in relation to Latvia as small open economy.

The main **problematic question** author did stumble upon is to differentiate causes from the consequences as some are interrelated. The **information sources** used in the study cover journal articles, working papers, policy papers, regulator's yearly reports. The main **delimitation** of research is the fact that some of the causes could not be proved as prevalent in Latvia as they pose as moral hazard problem and are linked to behaviour.

Turning on to **theoretical discussion** – some factors affecting systemic risk tend to change over cycle (Baele et al. 2015) or their importance and can be difficult to spot as prevalent. The other question, other than the agency problem, is the capacity to diversify the investment portfolios of financial institutions especially the large ones, given the operating market size in Latvia and rather high costs for operating in new unknown markets as well as the fact that even diversification has its limits in mitigating the risks (Markowitz, 1952). The last concern of this theoretical question is – how strong and full the regulation should be as if the regulation is too strong and costly, funds from regulated market will flow to shadow banking sector that is far less regulated (Co-Pierre, 2011) .

The paper is organized as follows – second part discusses various definitions of systemic risk and its implications, in the third part cause identifier with causes prevalent in Latvia during 2007-2013 is developed while the fourth part is dedicated to consequences of systemic risk. The last part of this study conclusions, proposals and recommendations are addressed.

Research Results and Discussion

1. Definition of Systemic Risk

During conducting the literature survey, it was found that researchers use various definitions of systemic risk even though the Bank for International Settlements that acts as umbrella institution for regulation already in 2003 defined systemic risk as *the risk that the inability of one or more participants to perform as expected will cause other participants to be unable to meet their obligations when due* (BIS 2003). Sum in 2016 expands the definition by including that individually financial institutions may be sound but triggered by exogenous event might trigger instability of the whole system and cause these financial institutions to fail (Sum 2016). Schuler and Schroder specifically state that this systemic event might even happen in parts of financial sector like payment and settlement systems or in securities market (Schüler & Schröder 2003). While Acharya defines systemic risk rather briefly - *systemic risk is a joint failure arising from correlation of returns on asset side of bank balance sheets (Acharya 2009)*. In scientific literature scientists also mention the fact that countries differ in explaining the systemic risk but one thing that they all have in common – that the systemic event has tremendous effects not only on financial sector but the real economy as well.

2. Causes of Systemic Risk and Prevalence in Latvia

This section shows cause identifier by agents and if these causes were prevalent in Latvia during years 2007-2013. The table no.1 shows the causes by banks or financial institutions in general.

Table 1

Causes of systemic risk by banks

Cause and author	If prevalent in Latvia and source
Size of a bank and asset correlation (Huang et al. 2012).	Yes, the largest banks in Latvia are marked as systemically important by the regulator since 2015 and about 30% of loans were issued in construction or real estate (FCMC 2009), (FCMC 2016).
Excessive risk taking if financial institutions is marked as systematically important (Co-Pierre, 2011)(Diamond and Dybvig, 1983).	Can not be proved.
Shareholders preferences for highly correlated assets and therefore increased probability of distress and probability of aid (Lau, 2011).	Can not be proved.
Top managers desire for higher profits (Lau, 2011) as sometimes CEO has limited power to control top managers.	Can not be proved.
Syndicates in loans that leads to increased overlap of investment portfolios (Allen, Babus and Carletti, 2010).	Due to rather small number of very large enterprises largest banks in Latvia tend to finance the same enterprises with different products.
Herding behaviour – banks choose to invest in similar industries that leads to higher profits in booming and shared losses in downslide (Acharya and Yorulmazer, 2003).	The most prevalent industries are operations with real estate, manufacturing and construction (FCMC 2014).
High relative volume of loans and intangible assets to total assets (Biase and D'Apolito, 2012).	Loans to households and enterprises takes up the largest part of total assets in banking sector in Latvia years 2008-2013. However, the share had decreased over time. (FCMC 2014).
Willingness to *ride the bubble* (Abreu Dilip;Brunnermeier M., 2003).	There was an asset bubble in real estate that burst in 2008 prices in real estate sector dropped significantly due to high level of late loan re-payments and restructuring going on (FCMC 2014).
Limited liability of banks (Dell'Ariccia and Ratnovski, 2014).	All banks in Latvia are public limited companies. This form of legal status ensures that losses incurred to shareholders do not exceed the equity stake while gains are unlimited (FCMC 2017).
Holding illiquid portfolios (Billio, Getmansky and Lo, 2010).	Largest part of investment portfolios was attributed to loans in real estate that were highly illiquid.

Source: author's construction based on literature survey and market analysis

As from the table no.1 can be seen – there are quite many causes that are linked to the banks and some of them are hidden in their sole business model. It is also important to state that during years 2007-2013 the largest part of causes was encountered in Latvia and some that pose on morality can not be directly proved but can be suspected. Acharya and Yorulmazer explains why banks choose to have high correlation of loan returns very well – the higher correlation, the higher the likelihood that banks will survive together and expected cost of borrowing is lower in the future and banks will have higher expected profits (Acharya and Yorulmazer, 2003). Banks in Latvia choose one form of imperfect correlation (Grippa Pierpaolo; Gornicka Lucyna, 2016) – real estate sector correlation as there are none very large enterprises who would be in need of financing from largest part of banks resident in Latvia.

The next table shows the causes that are linked to depositors and their willingness to control their investments. It needs to be noted that also depositors have a casting vote about the level of systemic risk.

Table 2

Causes of systemic risk by depositors

Cause and author	If prevalent in Latvia and source
Deposit insurance and higher GDP per capita (Laeven, Ratnovski and Tong, 2016).	Yes, there is Deposit Guarantee Fund that guarantees up to EUR 100 000 for any customer of Latvia's credit institution (FCMC 2009).
Depositors receive fixed rate instead of depending on investment result (Allen and Gale, 2006).	The absolute largest part of deposits in Latvia offers fixed deposit rate.

Source: author's construction based on literature survey and market analysis

Due to deposit insurance, there is no general need for depositors to monitor the stability of the banks and banks can be more risk bearing and take on correlated assets. Banks are forced to search for higher profits as they must guarantee the cost of interest paid to depositors. But in Latvia's case there exists another abnormality – due too many fraudulent cases after the second independence, depositors in Latvia are very anxious about the safety of banks. If slightest rumour happens, huge deposit runs are followed very shortly; even if the Deposit Guarantee Fund exists. While general depositors will not closely monitor which banks do take excessive risks or are of systemic importance.

The next agent is the regulator. Even though the regulator should act on minimizing the systemic risk due to its power and regulating nature there still happens to be room for causes for increased systemic risk that are attributed to the regulator. Therefore, the causes that can be attributes to the regulator are found in the table no 3.

Table 3

Causes of systemic risk by the regulator

Cause and author	If prevalent in Latvia and source
Regulators preference for exact asset types like AAA bonds (Black *et al.*, 2016) (Jobst, 2012).	Due to regulation based on Basel accords also banks in Latvia need to hold specific asset types to increase their soundness. Due to the fact that investing in any new market is costly if small in scale that leads to the fact that banks hold sovereign bonds of the same countries (Latvia, European Economic Area, USA and CIS [Commonwealth of Independent States]) (FCMC 2014).
Unregulated financial innovation (Guerra *et al.*, 2013).	The problem that financial innovation happens faster than regulators can catch up is a problem around the world and banks can use this for their benefits. However, banks in Latvia were not very active in credit derivatives.
Biased bail out and leniency towards domestic banks (Garratt, Webber and Willison, 2012) and systemically important institutions (Espinosa-Vega *et al.*, 2011).	Until there is no strict legislature on how banks should be bailed out the regulator will have a possibility to be more lenient towards domestic banks with domestic capital.
Preference of corporate debt over equity in investing (tax shields) (de Mooij and Hebous, 2017).	Legislation also in Latvia provides preference for corporate debt therefore creating favouritism towards banks and therefore leads to high share of loans in total assets of banks.

Source: author's construction based on literature survey and market analysis

From the table no.3 it is clearly seen that also the regulator has some power over systemic risk build up. Indeed, it is hard to catch up on financial innovation and regulating it. Besides this innovation has increased the pace of integration of global financial markets (Guerra *et al.*, 2013). However, the possibility to be more lenient towards domestic banks in hopes that this bank if in stress will improve in month rather than intervene on spot creates another moral hazard problem.

The final part of causes is attributed to the market. These causes are not one's direct responsibility but still if existent increase the systemic risk. Causes attributed to the market are found in table no.4.

Table 4

Causes of systemic risk by the market

Cause and author	If prevalent in Latvia and source
Incomplete markets and contracts (regulation that demands way too high capital buffers) (Allen and Gale, 2006).	Can not be proved.
Prevalence of credit derivatives (Kiff *et al.*, 2009).	Credit derivatives were not popular during 2007-2013.
Deteriorating trade competitiveness through appreciation of real effective exchange rate (Lund-Jensen, 2012).	As LVL had fixed exchange rate with EUR, LVL were appreciating against USD up until 2008 with sharp increases and drops yearly (XE 2017).
Highly competitive banking system with banks holding more capital to compensate for risks (Beck, De Jonghe and Schepens, 2013).	Banking sector in Latvia can be called highly competitive as the interest margins are very narrow as well as banks in Latvia provide very similar interests to deposits.

Source: author's construction based on literature survey and market analysis

One of the cause is incomplete markets where inefficiencies could lead to at least one financial institution not to perform as well as expected therefore not reaching pre-determined market return. While incomplete contracts leave space for inefficiencies as well that might lead to increased risk taking and interdependence between institutions, as they might be specializing in services while still being interconnected through payment system or interbank exposures.

According to study done by Bessler et al. ((Bessler, Kurmann and Nohel, 2015) in US holding companies systemic risk is also attributable to interest rate risk, credit risk, sovereign risk, real estate risk and market risk.

As this study shows – the causes for systemic risk can be attributable to different agents as they have different goals. Also, this study shows that the largest part of causes were prevalent in Latvia during years 2007-2013 therefore systemic risk has to be evaluated also in small open economies and that some causes are not prevalent, at least not in Latvia. The next section of results is devoted to consequences of systemic risk build-up and if they were prevalent in Latvia.

3. Consequences of Systemic Risk and Prevalence in Latvia

This section shows consequences of systemic risk and their prevalence in Latvia during years 2007-2013 as seen in the table no.5. Almost all (except 1) of consequences were evident in Latvia in some form as seen in the table no.5. Besides some of the consequences could not be limited due to ongoing asset bubble in real estate sector therefore to limit the systemic risk consequences in the future it is crucial to stop asset bubbles from forming and penalize *riders* timely.

Table 5

Consequences of systemic risk and prevalence in Latvia

Consequences and author	Evidence in Latvia and source
Bank panic and runs on banking system even in the absence of direct or indirect linkages (Lau, 2011).	After the crash of Parex bank the overall level of deposits decreased very sharply (FCMC 2009).
Expansion of shadow banking sector (Financial Stability Board, 2015).	There has been a sharp increase in funds in shadow banking sectors (FCMC 2014).
Disruption in market functioning and distress elsewhere in the world (Huang, Zhou and Zhu, 2012).	Latvia did not have a total disruption in market functioning. However, Latvia had freeze of credit sales and decrease of real GDP.
Government bailouts during times of stress (Laeven, Ratnovski and Tong, 2016).	Latvian government bailed out AS Parex bank in November 2007 (FCMC 2009).
Stock markets decrease in value; depreciation of the domestic currency (Herger, 2008).	As LVL was fixed to EUR and USD was not stable currency it is fair to say that LVL decreased in value against AUD significantly. (XE 2017).
The cost of borrowing increases (Acharya and Yorulmazer, 2003).	EUR LIBOR increased in all Europe as well as local interbank borrowing rate RIGIBOR increased significantly in years 2007-2009 (Bank of Latvia 2009).
Defaults, fire sales and counterparty fear (Garratt, Mahadeva and Svirydzenka, 2011).	During economic crisis that followed in Latvia there were unprecedented levels of defaults. Bank loan portfolios were taken over and few banks exited the market (at least 3 during 2013.) (FCMC 2014).
Lender of last resort provides high liquidity to banks that merge (Acharya and Yorulmazer, 2008).	No banks during financial crisis merged in Latvia.

cont. table 5 "**Consequences of systemic risk and prevalence in Latvia**"	
Consequences and author	Evidence in Latvia and source
Liquidity shortages and broken interbank linkages (Laeven, Ratnovski and Tong, 2016).	Banks experienced liquidity shortages during 2008 and 2009 due to increased funding needs in EUR and LVL and succeeding borrowing rate increases (Bank of Latvia 2009).
Depressed asset values that leads to bank insolvency (Diamond and Rajan, 2011).	Banks resident in Latvia had rather high default on loans and other loans sharply decreased in value (FCMC 2014) as the collateral (real estate) lost its value.
Decrease in ratings for banks that leads to market losses (Sy, 2009).	Few banks had rating decreases so low that they decided not to publish them and abandon ratings at all.

Source: author's construction based on literature survey and market analysis

Table no.5 very well shows that there exist various consequences that can have tremendous losses for diverse agent groups as well as the whole economy.

The next subsection is devoted to discussion part were few fundamental questions are discussed and the results are being evaluated.

4. Discussion

One of the basis for whole study is the agency problem – meaning that each of agents mentioned in this study have different goals - from profit maximizers (banks) to social benefits maximizers (the regulator) (Zhang, 2010). This agency problem leads to fundamental problem – it is nearly impossible to align incentives therefore some of the causes could not be fully exterminated.

Another problem that were stumbled upon – the fact that number of causes of systemic risk tend to increase with market uncertainty (Baele *et al.*, 2015). This is indeed a problem when trying to evaluate if cause is prevalent or not as it might be evident just shortly before or after crash. Also, asset bubbles are usually hard to spot on during first phases.

The next discussion issue is the diversification problem as many authors cite that diversification is the solution for highly correlated assets. However, there are diversification limits as well as truly large banks have their limits in expanding diversification as even global financial market has its own limits. Of course, this is not the case of banks residing in Latvia as from their investment portfolios few countries can be seen as investment directions (EEA, CIS and USA).

The last discussion point should be devoted to the strictness of regulation. It is seen that not only in the most developed countries (Co-Pierre, 2011) but also in Latvia funds tend to flow towards shadow banking sector that has far less strict rules and the left banks in this strict regulation are forced to find new sources of income to balance out extra capital buffers and still satisfy shareholders with high enough profitability. Besides regulated sector has to compete with rather newly found FinTech sector that provides solutions typical to regulated banking sector. Another issue with too strict regulation is the easiness to transfer banking business to another country with less strict rules. This is of particular importance in Latvia as it has strong historical links to CIS countries where banking regulations are more lenient.

Conclusions, Proposals, Recommendations

Main conclusions of research are:

1. Causes of systemic risk can be attributed to 4 agents – banks, depositors, the regulator and market.
2. During this study 21 causes have been identified – 10 related to banks, 3 related to depositors, 4 related to the regulator and 4 related to market. Therefore, it can be concluded that banks or financial institutions are the most important systemic risk creators.
3. Various causes of systemic risk were prevalent in Latvia during 2007-2013.
4. Some of the causes could not be directly proved due to moral hazard issue.
5. An important cause in Latvia's case is highly correlated assets due to asset bubble in real estate – just before the crisis more than 30% of loans were issued in construction or real estate.
6. Another significant cause of systemic risk is the limited liability of banks in Latvia as this pose a moral hazard problem and incentive to take excessive risks as expected profits do not have the limit while losses are limited with shareholders' equity or perceived guarantee that bank will be bailed out due to systemic importance.

The proposals and recommendations of research are:

1. To researchers: determine exact definition of systemic risk (maybe the one of BIS);
2. To market participants: expand the investment areas and fields;
3. To regulators: limit the possibility of being biased towards systemically important institutions;
4. To regulators: value the need for fixed deposit insurance;
5. To regulators: limit the possibility of natural creation of central institution.

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THE COMPARISON OF EXPORTING AND NON-EXPORTING ENTERPRISES IN LATVIA

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*The author gratefully acknowledges financial support from the National Research Programme SUSTINNO

Abstract. Most of the economic literature agree that exporting and non-exporting enterprises differ in the various measures of performance. Identification of the export barriers and the determination of the differences of exporters and non-exporters can help to develop such policies that would encourage non-exporting enterprises to start successfully exporting. This research is aimed at exploring the differences between exporting and non-exporting enterprises in Latvia from several aspects, i.e**.,** export opportunities; productivity; opportunities of fundraising; innovativeness. The research is based on SKDS survey data on a random sample of 800 medium-sized Latvian enterprises and their economic performance in 2015.

A mean-comparison test is used to find a statistically significant difference in the mean values of various characteristics of exporting and non-exporting enterprises. The analysis shows that directly exporting enterprises differ from the non-exporting enterprises in several characteristics: directly exporting enterprises have on average a higher turnover, employ higher number of employees, pay higher salaries, and display higher productivity, experience higher growth of number of employees and wage growth. In addition, exporting enterprises are managed by the leaders with the higher education level. Exporting enterprises tend to be more innovative.

The major barrier to exporting turned to be the fierce price competition in the foreign market. The major barriers to start exporting is the fierce price competition in the foreign market, the initial cost of exporting and the difficulties in finding information on the foreign markets.

Key words: exporting enterprises, non-exporting enterprises, productivity, fundraising, innovations.
JEL code: F14, O31, L26

Introduction

Most of the economic literature agree that exporting and non-exporting enterprises differ in the various measures of performance, e.g. exporting enterprises display on average higher labour productivity, employ more employees and pay higher taxes than non-exporters. Identification of the export barriers and the determination of the differences of exporters and non-exporters can help to develop such policies that would encourage non-exporting enterprises to start successfully exporting.

There is a large number of empirical studies on exporting and non-exporting enterprises in European countries and US that demonstrate that exporting enterprises are in average more productive than otherwise identical but not exporting enterprises. Wagner (2007) states that exporting enterprises are more productive not specifically because of benefits derived from exporting, but because being more productive allows them to overcome the fixed costs of entering foreign markets (known as the self-selection hypothesis). The second possibility is that productivity of enterprise improves as a result of their exporting activity, e.g., remaining competitive in a strong competitive environment, in the result of "learning by exporting" and recouping of investments over a larger sales volume (Love, J. H. and Roper, S., 2015). Girma S., Greenaway D., and Kneller R. (2004) demonstrate that exporting may boost productivity when increasing the share of exporting.

Exporting enterprises tend to pay higher wages than non-exporting enterprises due to self-selection of more productive enterprises into export markets; thereby higher wages are not caused by export activities (Schank T., Schnabel C., and Wagner J., 2010).

There are contrasting results about the link between financial factors and exporting of enterprises. Bellone F., Musso P., Nesta L., Schiavo S. (2009) demonstrate that enterprises enjoying better financial health are more likely to become exporters and state that financial constraints are the barrier to export participation. Other empirical literature (e.g., Greenaway et al., 2007) found evidence that export participation improves the financial health of enterprises, but not that enterprises that starting up exporting display any ex-ante financial advantage.

Eurostat (2015) article compares exporting and non-exporting enteprises in eight European countries including Latvia and provides the insights into economic performance and characteristics of exporters in 2008 and 2012 presenting the analysis of developments since the economic crisis started. They found that non-exporters in a greater extent were exposed to the effect of the financial crisis than exporters. For the majority of countries, from 2008 to 2012 non-exporters lost more employment than exporters. In most countries, exporters have increased their productivity more than non-exporters. Foreign-controlled traders generate a relatively larger share of exports and more exports per employee than domestically controlled traders do.

Putniņš T. J (2013) aims at describing the export activity of Latvian companies and provides the insights for potential exporters on what business processes are associated with export success. According to Putninš T.J (2013), exporting companies tend to be larger, younger and faster growing than their non-exporting counterparts. They pay higher wages, consistent with the notion that they have higher labour productivity or utilise more skilled labour on average.

This research is aimed at exploring the differences between exporting and non-exporting enterprises in Latvia from several aspects, i.e., export opportunities; productivity; fundraising and innovativeness. The research covers the latest period compared with other previously conducted studies, comparing the economic performance of enterprises in 2010 and 2015. The research is aimed to answer the following questions: (1) What are the characteristics of Latvia exporting enterprises? (2) What are the major barriers for exporting in Latvia? (3) What are the major barriers to start exporting in Latvia? (4) Are there the difference between factors expected to effect the productivity? (5) Are there any differences in a way of fundraising? (6) Are the exporting enterprises more innovative?

The research is based on Marketing and Public Opinion Research Centre SKDS survey data on 800 Latvian enterprises of 2015. The target group of the survey is medium-sized economically active enterprises registered in Latvia. Following Putniņš T.J. (2013) we construct a random sample of enterprises registered in Latvia, that (i) have annual turnover between EUR 500 thousand and EUR 50 million (ii) were registered in 2007 and earlier; and (iii) are not from the real estate or financial sectors. Respondents are the business owners, managers and leading specialists. The survey method is Computer assisted telephone interviews. To our knowledge the number of responses collected during the survey is currently the largest comparing with the other surveys that allow analysing the export activities of Latvian enterprises.

A mean-comparison test is used to find a statistically significant difference in the mean values of various characteristics of exporting and non-exporting enterprises.

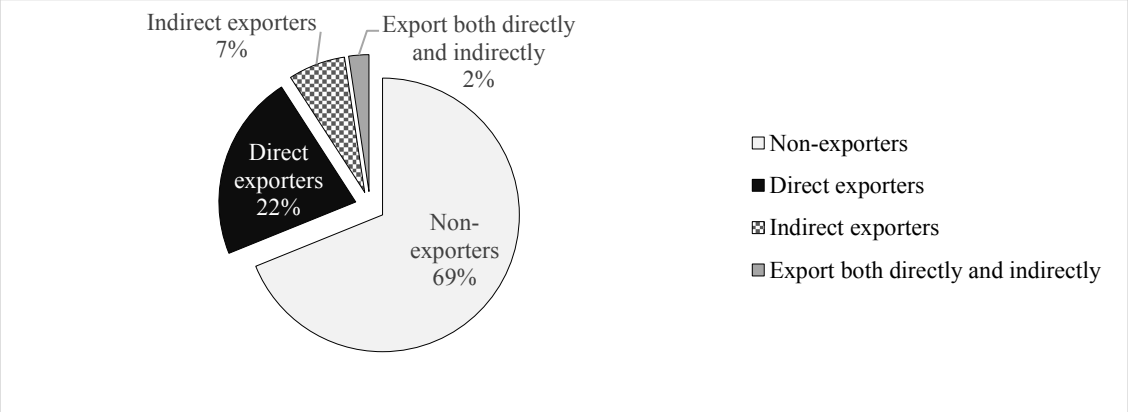
The author gratefully acknowledges financial support from the National Research Programme SUSTINNO.

Research results and discussion

1. A portrait of a typical Latvian exporter

This section gives the insight into the types of enterprises that are the most export oriented in Latvia. The enterprises are distinguished by the types of exporting; by sector, in which the enterprise operates, type of control (domestic and foreign ownership), the turnover, the profit, the number of employees and some other characteristics.

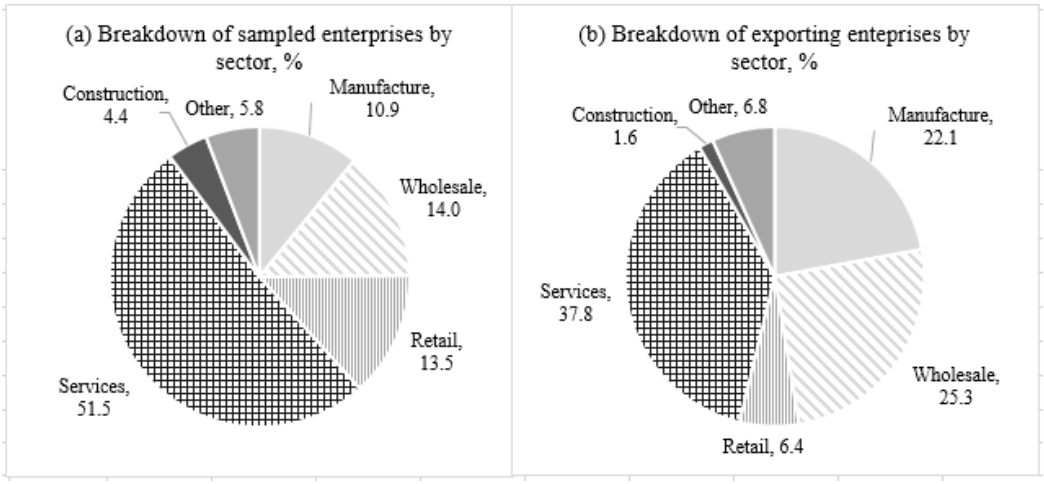
Enterprises can sell their goods and services in the domestic market, can directly export to another country or can export indirectly by selling them to a domestic third party that exports the goods and services afterwards. Figure 1 reports the breakdown of the sampled enterprises by the types of exporting. Out of 800 sampled enterprises, 249 enterprises or 31.1% are the exporters and the majority of enterprises, i.e., 551 enterprise or 68.9%, sell their goods or services only in the domestic market. 22% of enterprises are direct exporters, 7% are indirect exporters and 2% export both directly and indirectly.



Note: base is all enterprises, n=800
Source: author's calculations based on the SKDS survey data.

Fig.1. **Breakdown of the sampled enterprises by the types of exporting, %**

See figure 2. The service sector makes the largest part of the surveyed enterprises (51.5%), following by the wholesale sector represented by the 3.7 times smaller number of enterprises (making up 14.0% of all surveyed enterprises). Despite the fact, that the service sector is not a leader by the share of exporters within it with roughly every fifth enterprise operating in this industry is exporter (see table 1 for the details), most surveyed exporters (37.8%) operate in the service sector.



Note: base is (a) all enterprises, n=800 (b) exporting enterprises, n=249
Source: author's calculations based on the SKDS survey data.

Fig.2. **Breakdown of the full sample of enterprises and the exporting enterprises by sector, %**

Table 1 reports the breakdown of enterprises operating in each sector by the type of exporting. The highest export activity has been observed in manufacturing sector with the total share of exporters equal to 63.2%, consisting of 49.4% of direct exporters, 6.9% of indirect exporters and 6.9% exporting both directly and indirectly. Wholesale sector is the second most involved in exporting with 56.2% of exporters, while the least share of exporting enterprises is in the retail and construction sectors with 14.8% and 11.4%, respectively.

According to the survey data, foreign-controlled enterprises (hereafter defined as enterprises for which foreign enterprises, individuals and organisations own 50% or more of the enterprise's shares) are more export oriented than the local owned enterprises. Exporting enterprises make up 54.0% out of 76 foreign-controlled enterprises and 29.0% out of 717 domestically owned enterprises. Since the considerably larger share of all sampled enterprises are domestically owned (717 enterprises or 89.6%), the most exporting enterprises. i.e., 208 enterprises or 83.5%, are also owned by the local owners.

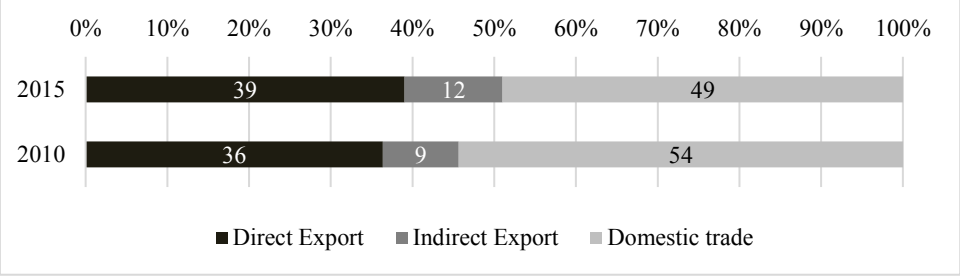
Table 1.

Breakdown of enterprises operating in each sector by the type of exporting, %

	Non-exporters	Exporters	Direct exporters	Indirect exporters	Both direct and indirect
Manufacture	**36.8**	**63.2**	**49.4**	**6.9**	**6.9**
Wholesale	**43.8**	**56.2**	**33.9**	**19.6**	**2.7**
Retail	**85.2**	**14.8**	**12.0**	**1.9**	**0.9**
Services	**77.2**	**22.8**	**16.7**	**4.6**	**1.5**
Construction	**88.6**	**11.4**	**5.7**	**2.9**	**2.9**
Other	**63.0**	**37.0**	**23.9**	**8.7**	**4.3**

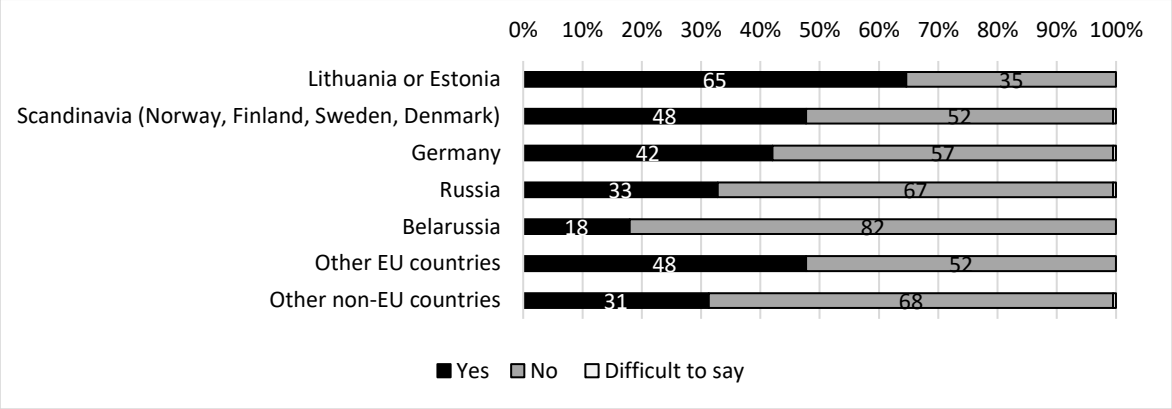
Note: base is enterprises operating in (1) manufacturing sector, n=87; (2) wholesale sector, n=112; (3) retail sector, n=108, (4) services, n=412, (5) construction sector, n=35, (6) other sectors, n=46
**base is all enterprises, n=800*
*** base is all sampled exporting enterprises, n=249*
Source: author's calculations based on the SKDS survey data.

On average, in 2015 the direct and indirect export made up 39% and 12% of the exporting enterprises` turnover, while the domestic trade made up roughly the half (49%) of the turnover (see figure 3). In 2010, the average contribution of export to the turnover of exporting enterprises accounted for 45% comparing with 51% in 2015.



Note: base for 2015: exporting enterprises, n=249. Base for 2010: exporting enterprises, whose representatives answered the corresponding question, n=236
Question formulation in the questionnaire: "Please give a rough assessment of the contribution of domestic trade, direct and indirect export to the turnover of the enterprise now and 5 years ago"
Source: author's calculations based on the SKDS survey data.

Fig.3. **The contribution of the domestic trade, direct and indirect export to the turnover of the exporting enterprise, 2010 and 2015**

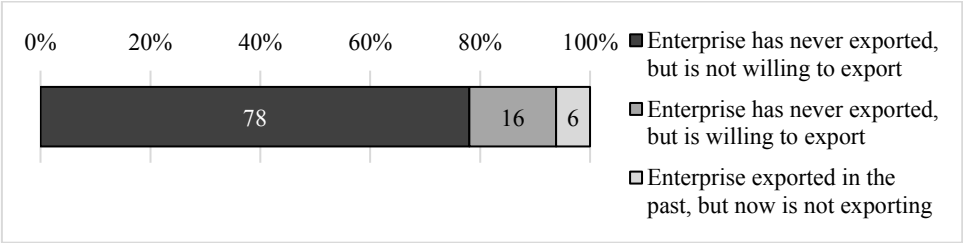


Note: base is the enterprises engaged in direct exporting, n=195
Question formulation in the questionnaire:"Is your enterprise exporting to any of the following countries?"

Fig.4. **Export destinations of Latvian direct exporters, % of direct exporters**

Latvian entrepreneurs are exporting to the neighboring countries and the Scandinavian countries, as well as to other European Union Member States and to the rest of the world. See figure 4. The most popular export destinations of Latvian direct exporters are Lithuania and Estonia with 65% of all surveyed direct exporters exporting to these countries. Almost half (48%) of the direct exporters are exporting to at least one of the Scandinavian countries and the same share, i.e. 48% of direct exporter are exporting to other EU countries (except Germany, export to which was treated separately with 42% of direct exporters exporting to Germany).

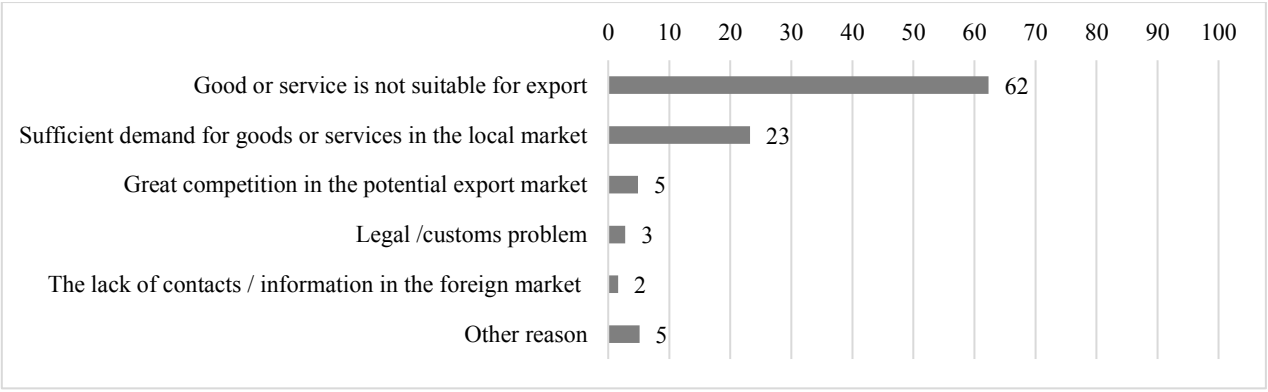
Figure 5 shows, that the majority of the enterprises currently not engaged in exports have never exported and are not willing to export (78%). 6% have stopped exporting, but 16% have not previously exported but are considering exporting in the future.



Note: base is the enterprises, not engaged in the export, n=551
Question formulation in the questionnaire:"Which of the following statements describes the situation of Your enterprise?"
Source: author's calculations based on the SKDS survey data.

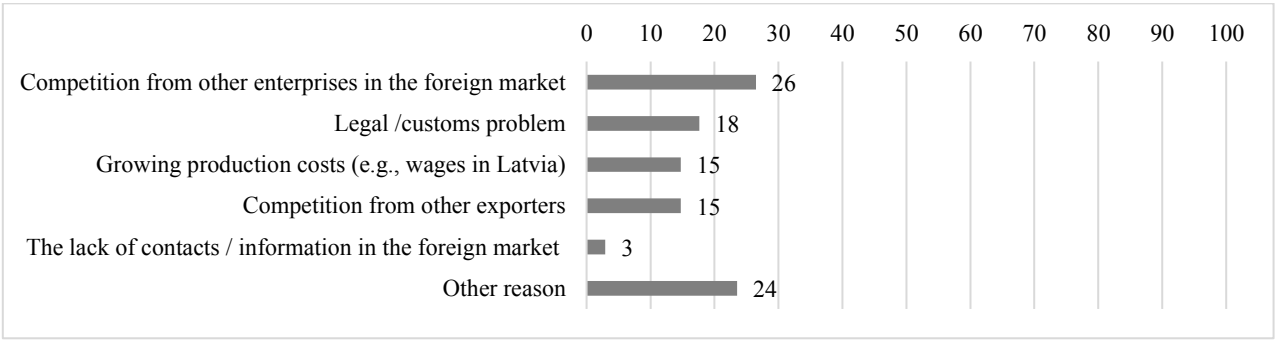
Fig.5. **Non-exporters` intentions about export**

The main reason for not willingness to export that was mentioned by 62% of the representatives of those enterprises not engaged in exports and are not considering to export, is the unsuitability of goods or services for export (see figure 6). Those enterprises, that stopped exporting, did so mainly due to the pressure of the competition (26%), as well as due to legal or customs problems (18%) (see figure 7).



Note: base is the enterprise not engaged in exports and are not considering to export,, n=430
Question formulation in the questionnaire: "What is the main reason for not willingness to export?"

Fig.6. **The reasons for not-willingness to export, %**



Note: Base is the enteprises not engaged in export, but exported their goods or services in the past, n=34
Question formulation in the questionnaire: "What was the main reason for stopping exporting?"

Fig.7. **The reasons for stopping exporting, %**

A mean-comparison test is used to find a statistically significant difference in the mean values of various characteristics of exporting and non-exporting enterprises. See table 2. The analysis shows that directly exporting enterprises differ from the non-exporting enterprises in several characteristics: directly exporting enterprises have on average a higher turnover, employ higher number of employees, pay higher salaries, and display higher productivity (as measured with thousands EUR of turnover per employee), experience higher growth of number of employees and wage growth. In addition, exporting enterprises are managed by the leaders with the higher education level.

Table 2.

Means and the difference in means of characteristics of exporting and non-exporting enterprises

	Means					The difference in means			
	Non-exporters (1)	Exporters (2)	Direct exporters (3)	Indirect exporters (4)	Direct and indirect (5)	(2-1)	(3-1)	(4-1)	(5-1)
Years of operation	14.6	15.2	15.1	16.3	13.9	0.6	0.5	1.7	-0.7
Turnover	1.1	5.2	4.6	1.1	22.6	4.1***	3.5***	0.00	21.5***
Turnover growth	13.2	21	28.1	2.4	1.3	7.8	14.9	-10.8	-12.0
Profit	0.3	0.2	0.2	0.1	0.6	-0.1	-0.1	-0.2	0.3
Profit growth	1.5	0.1	-0.5	2.8	0.4	-1.5	-2.1	1.3	-1.1
Number of employees	20.8	35.1	40.5	12.3	51.1	14.4**	19.7***	-8.5	30.3
Growth of the number of employees	1.1	1.7	1.6	1.8	2.0	0.6***	0.5***	0.7***	0.9***

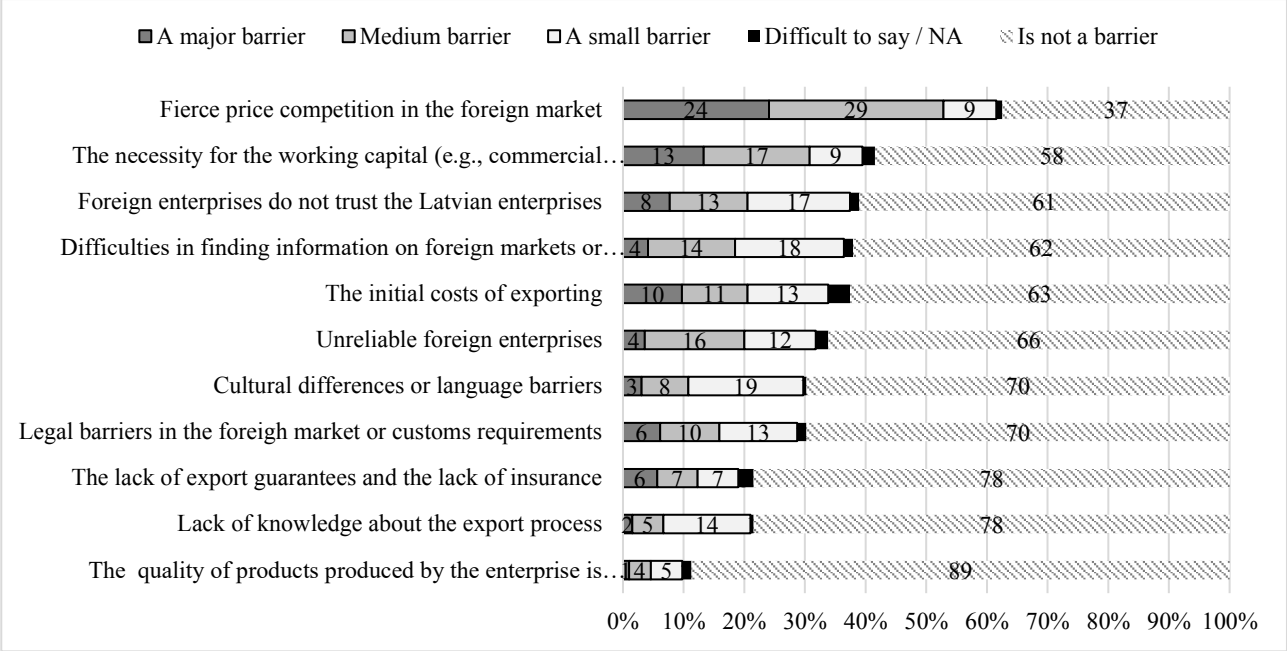
	Means					The difference in means			
	Non-exporters (1)	Exporters (2)	Direct exporters (3)	Indirect exporters (4)	Direct and indirect (5)	(2-1)	(3-1)	(4-1)	(5-1)
Average monthly wage, EUR	469.5	642.5	672.7	542.7	596.2	173.0***	203.2***	73.2	126.7*
Wage growth	1.1	1.4	1.3	1.6	2.2	0.3***	0.2***	0.5***	1.1***
Productivity	57.4	128.6	133.7	82.6	212.3	71.2***	76.3***	25.2	155.0***
Productivity growth	8.2	16.1	21.7	1.3	1.0	7.9	13.4	-7.0	-7.2
Management experience	15.6	15.1	14.8	16.2	14.5	0.5	0.8	0.6	1.1
Manager`s education level	3.1	3.3	3.4	3.1	3.3	0.3***	0.4***	0.0	0.2

Note: Profit and turnover is measured in EUR million per annum. Average monthly wage corresponds to the full time staff equivalent. Turnover, profit and wage growth, as well as growth of the number of employees and productivity growth correspond to the 5-year growth 2010-2015. Productivity is measured in thousands EUR of turnover per employee. Management experience correspond to the experience in the business management of the enterprise`s manager measures in number of years. Manager`s education level takes 4 values: 1 for basic and secondary education, 2 for professional secondary; 3 for bachelor`s degree or its equivalent; 4 for Master`s and Doctoral degree.
Source: author's calculations based on the SKDS survey data.

However, if we distinguish exporters by the type of export, namely direct exporters, indirect exporters and enterprises exporting both directly and indirectly, we see that indirect exporters statistically significant differ from non-exporting enterprises only with the means values of the growth of the number of employees and the wage growth. This fact could indicate that the indirect exporting does not require much additional capacity of enterprises compared with domestic sales.

2. The barriers to export

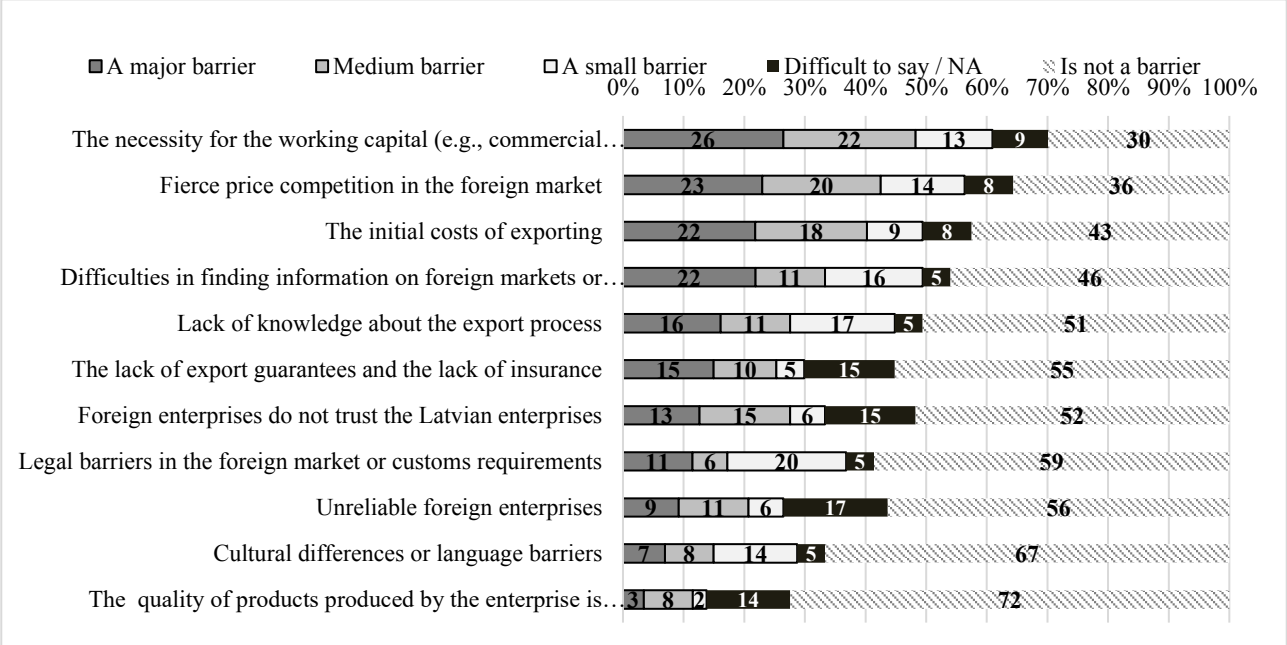
Figure 8 displays the assessment of the importance of the barriers to export by the enterprises engaged in the direct export. A most frequently mentioned barrier to exporting is the fierce price competition in the foreign market (53% of direct exporters see it as a major or medium barrier). The study revealed that the necessity for the working capital, the distrust of the foreign enterprises in Latvian enterprises, difficulties in finding information on foreign markets and the initial costs of exporting are considered the significant barriers to export (with more than 20% of direct exporters see them as a major or medium barrier).



Note: Base is the enterprises engaged in the direct export, n=195
Question formulation in the questionnaire:"For each of the factors, say, whether it is large, medium, small or has not been a barrier to export. "

Fig.8. **The barriers to export**

When the respondents were asked to name other important barrier by themselves, 5% of direct exporters indicated the Latvian tax policy as an important barrier that was the most frequently mentioned answer. Only 29% of the enterprises that engaged in direct exports (n = 195) named another specific barrier to export, 3% believe there is no other barriers, 3% believe there are not the barrier to export at all, but for 66% of direct exporters found it was difficult to say.



Note base is enterprises, not engaged in exports, but are considering to start exporting, n=87
Question formulation in the questionnaire: "To what extent these factors are a barrier for the enterprises to start exporting?"

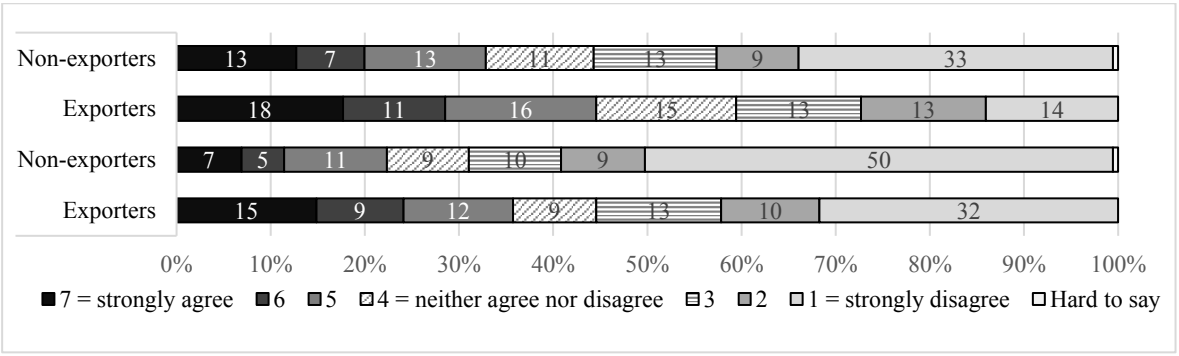
Fig.9. **The barriers to start exporting**

Figure 9 shows the assessment of the importance of the barriers to start export by the enterprises not engaged in the export but considering to start exporting. The major obstacles to start exporting for enterprises that would like to export is the necessity for the working capital, the fierce price competition in the foreign market, the initial cost of exporting and the difficulties in finding information on the foreign markets. 40% of enterprises that would like to start exporting (n =

87), also mentioned other barriers to start exporting, 3% indicated there are no other barriers, 1% believes there are no barriers to start exporting at all, 55% found it is difficult to say. The most popular of them are Latvian tax policy, insufficient funding and the lack of specialists (all three barriers were mentioned by 6% of those willing to start exporting).

3. Productivity

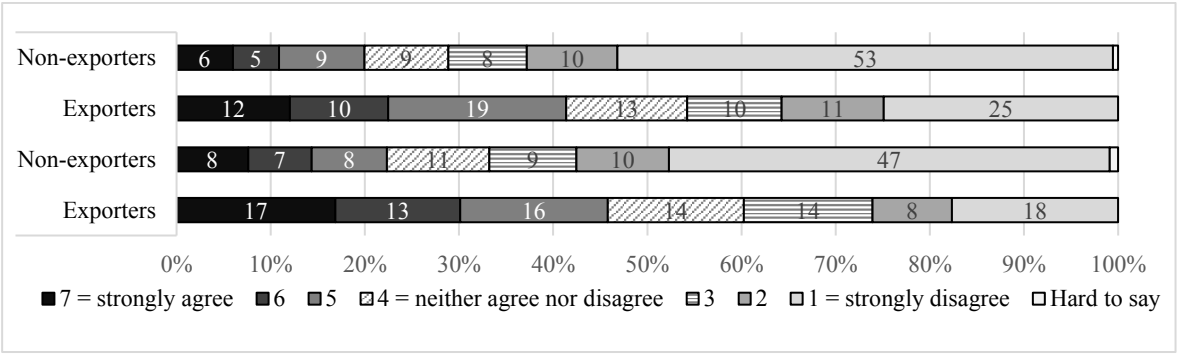
Staff training and skills improvement. Exporters find the staff training and their skills improvement more important than non-exporters. See figure 10. 36% of exporters are investing in training new employees (rated their attitude to the statements with agreement - 7, 6 or 5) and 45% of exporters are making significant investments in training and education of the existing staff to enhance their capacity in carrying out their tasks (rated their attitude to the statements with agreement - 7, 6 or 5). To compare with non-exporters – the corresponding shares are equal to 22% and 33% respectively.



Note: base is all enterprises, n=800
Source: author's calculations based on the SKDS survey data.

Fig. 10. **Rating of the attitude to the statements: (1) "The enterprise is making significant investments in training new employees" (2) "the enterprise is making significant investments in training / education of the existing staff to enhance their capacity in carrying out their tasks"**

Bonuses and remuneration, incentive schemes. Figure 11 shows that almost half of the surveyed exporters (46%) and roughly each fifth (22%) non-exporter widely uses the financial bonuses and increase the remuneration to reward employees` good performance (and rated their attitude to the statements with the rate of agreement - 7, 6 or 5). Granting the non-financial bonuses is a common practice in 41% exporting and 20% non-exporting enterprises (rated their attitude to the statements with the rate of agreement - 7, 6 or 5).

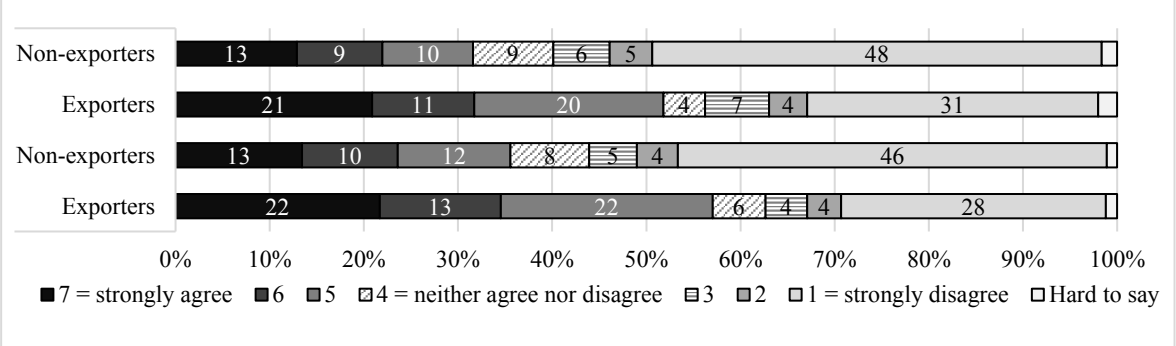


Note: base is all enterprises, n=800,
Source: author's calculations based on the SKDS survey data.

Fig. 11. **Rating of the attitude to the statements: (1) "The enterprise is widely using the financial bonuses and the increase in the remuneration to reward employees' good performance"** (2) **"The enterprise is widely using the non-financial incentives to motivate employees"**

The use of machinery & equipment. The share of exporters introducing the latest equipment and investing in installation of machinery and equipment (which rated their attitude to the statement with the rate of agreement - 7, 6 or 5) is larger than the corresponding share of non-exporters (see figure 12). In order to reduce production costs, half of the exporters (52%) and every third non-exporter (32%) has actively invested in installation of machinery and equipment

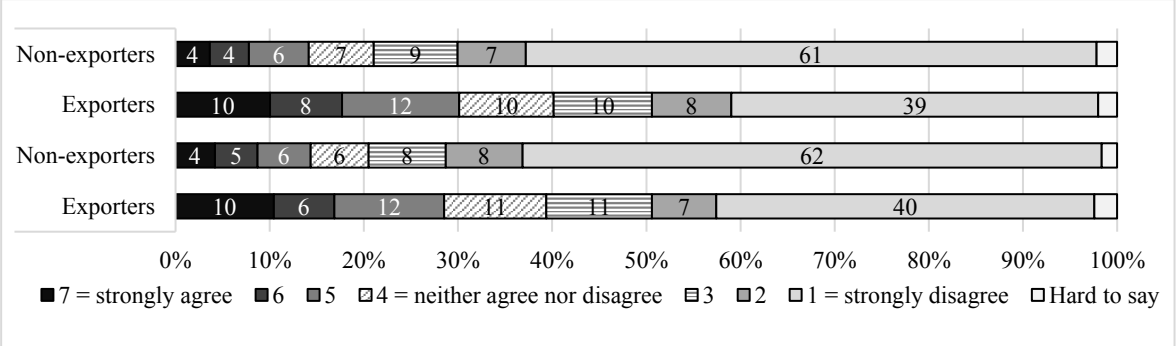
(rated their attitude to the statement with the rate of agreement - 7, 6 or 5). More than half of the surveyed exporters (57%) and 36% of non-exporters are trying to introduce the latest equipment in the production process.



Note: base is all enterprises, n=800,
Source: author's calculations based on the SKDS survey data.

Fig. 12. **Rating of the attitude to the statements: (1) "The enterprise is trying to introduce the latest equipment in the production process" (2) "In order to reduce production costs, the enterprise has actively invested in installation of machinery and equipment"**

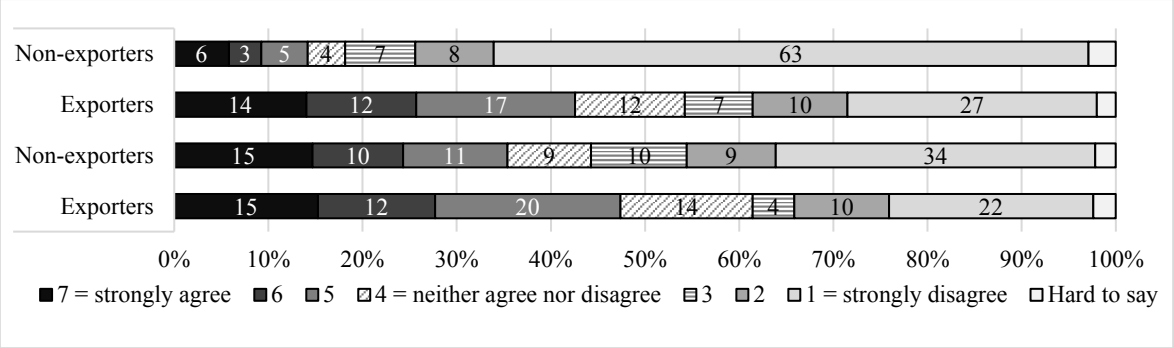
Research and development and the desire to bring innovations: Exporters are tended to be more innovative than non-exporters. See figure 13. 29% or every third exporter invests considerable resources in research and development of new products (rated their attitude to the statement with the rate of agreement - 7, 6 or 5), while only 14% of non-exporters do this. Finding the cost effective production method is a motivation for investing in research and development of 30% exporters and 14% non-exporters (rated their attitude to the statement with the rate of agreement - 7, 6 or 5).



Note: base is all enterprises, n=800,
Source: author's calculations based on the SKDS survey data.

Fig. 13. **Rating of the attitude to the statement: (1) "The enterprise invests considerable resources in research and development of new products" (2) "The enterprise invests significant resources in research and development in order to find the cost effective production methods"**

Increasing Competition. Increasing competition encourages the exporters to find a way to cut costs to a greater extent than non-exporters. See figure 14. Exporters are largely affected by the competition between local enterprises (47% of exporters) and by competition caused by foreign enterprises (43%) (rated their attitude to the statement with the rate of agreement - 7, 6 or 5). 35% of non-exporters are affected by local enterprises, while foreign enterprises force to reduce costs only for 14% of non-exporters (rated their attitude to the statement with the rate of agreement - 7, 6 or 5).

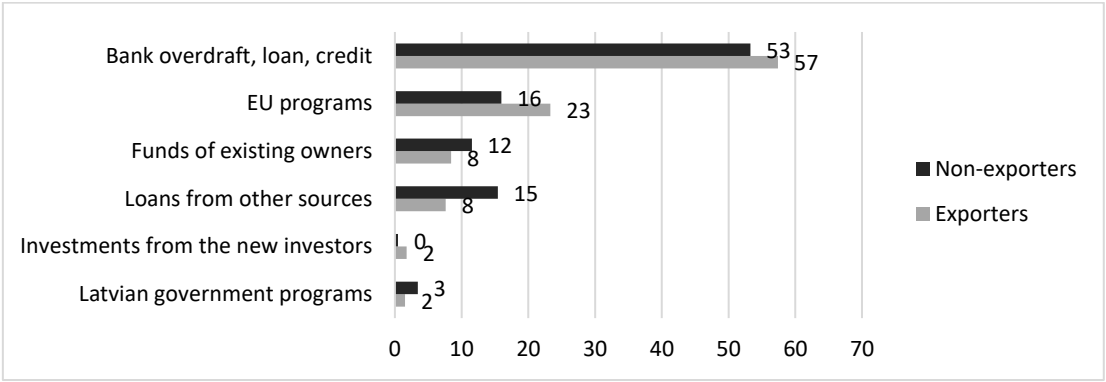


Note: base is all enterprises, n=800,
Source: author's calculations based on the SKDS survey data.

Fig. 14. **Rating of the attitude to the statements: (1) "Increasing competition between local enterprises has encouraged my enterprise to find a way to cut costs" (2) "Increasing competition caused by foreign enterprises has encouraged my enterprise to find a way to cut costs"**

4. Fundraising

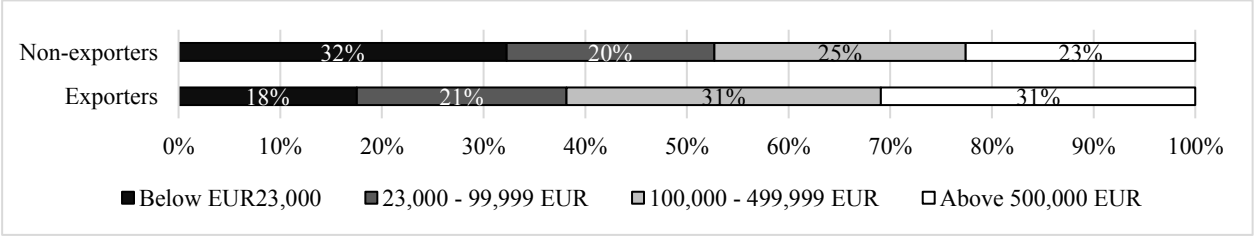
There is an evidence of a greater share of exporting enterprises, than non-exporting enterprises, which are attracting funds to develop their business in the last 3 year. According to the survey results, 43% of exporters and 20% of non-exporters has attracted funds to develop their business in the last 3 years. More than 60 percent of these enterprises gained the additional funds from the banking services.



Base: respondents, which attracted funds in the last 3 years, n=218
Question formulation in the questionnaire: "What is the source of the funding attracted in the last 3 years? Please rate the percentage of each source in the total fundraising."

Fig. 15. **The average proportion of funding by type of funding source, %**

Figure 15 displays the average proportion of funding by type of funding source. On average more than half of the attracted funds (53% of non-exporters` funds and 57% of exporters` funds), were gained from one of the banking services, such as a bank overdraft, loan or credit. The second largest contribution to the overall amount of funding was provided by the European Union's programs: non-exporters and exporters gained 16% and 23% of their total funds respectively from EU programs. Other less important sources are funds from existing owners and loans from other sources.



Note: base is the respondents, who have attracted funds to engage in new projects, make investments or to develop business in the past 3 years, and replies to the answer; Exporters - n=97. Non-exporters – n=93
Question formulation in the questionnaire: "Approximately how much funding did the enterprise raise from sources other than the enterprise's profits in the last 3 years?"

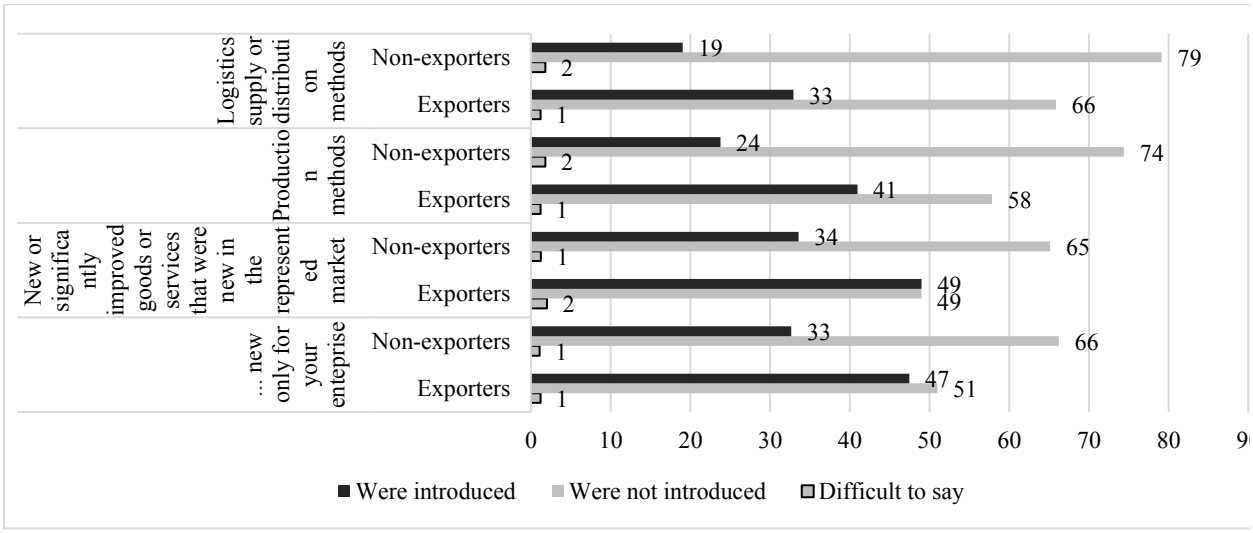
Fig. 16. **Breakdown of the enterprises by the amount of the attracted funding, %**

Exporting enterprises tend to raise larger funding from sources other than the enterprise's profits (see figure 16). Large funding above EUR 500,000 was attracted by 31% of exporters and 23% of non-exporters. Funding above EUR 100,000 was attracted by 62% of exporters and 48% of non-exporters.

24% of exporters and 29% of non-exporters which have attracted funds in the last 3 years points out that the funding received was not sufficient to fund new projects or development of the enterprise but they were not able to raise more funding. 61% of exporters and 52% of non-exporters that found the attracted funding not sufficient were provided only with the part of the claimed finding by the bank. 30% of exporters and 36% of non-exporters that found the attracted funding not sufficient were refused of granting any funding.

5. Innovations

The survey revealed that exporters are more innovative in relative terms; while the most common type of innovation is “a new or significant improved good or service that is new in the represented market”. See figure 17. According to the survey data, 47% of exporters and 33% of non-exporters have introduced new or significantly improved goods that were new only for their enterprises. 49% of exporters and 34% of non-exporters have introduced new or significantly improved goods or services that were new in the represented market.



Base: all respondents, n=800
Question formulation in the questionnaire: "In the last 3 years your company has introduced new or significant improved...?"

Fig.17. **The proportion of exporting and non-exporting enterprises which introduced the different types of innovations, %**

41% of exporters and 24% of non-exporters have introduced new or significantly new production methods. 33% of exporters and 19% of non-exporters have introduced new or significantly improved the logistics supply or distribution methods. In general, those enterprises that have introduced the innovations note that they experience the return of the investments and the increased profit.

The exporters on average experience the larger contribution of the product and process innovations introduced in the last 3 years to the current profit. 18.7% of non-exporters and 23.1% of exporters believe that the product innovations introduced in the last 3 years contribute at least to 20% of the current profit of the enterprise. 11.8% of non-exporters and 22.6% of exporters believe that the process innovations introduced in the last 3 years contribute at least to 20% of the current profit of the enterprise.

Conclusions

Directly exporting enterprises differ from the non-exporting enterprises in several characteristics: directly exporting enterprises have on average a higher turnover, employ higher number of employees, pay higher salaries, and display higher productivity, experience higher growth of number of employees and wage growth. In addition, exporting enterprises are managed by the leaders with the higher education level.

The main reason for not willingness to export that was mentioned by the representatives of those enterprises not engaged in exports and are not considering to export, is the unsuitability of goods or services for export. The major barrier to exporting for already exporting enterprises turned to be the fierce price competition in the foreign market. The major barriers to start exporting for enterprises not engaged in exports, but are considering to start exporting, is the fierce price competition in the foreign market, the initial cost of exporting and the difficulties in finding information on the foreign markets. Those enterprises, that stopped exporting, did so mainly due to the pressure of the competition as well as due to legal or customs problems.

Exporters on average display the higher productivity (as measured in thousands EUR of turnover per employee). There is a evidence of a larger share of exporters (i) making significant investments in training new employees and the existing staff to enhance their capacity in carrying out their tasks; (ii) widely using the financial bonuses and increasing the remuneration to reward employees` good performance, as well as granting the non-financial bonuses; (iii) investing in the latest equipment and introducing the latest equipment and investing in installation of machinery and equipment. Increasing competition encourages the exporters to find a way to cut costs to a greater extent than non-exporters.

According to the survey results, 43% of exporters and 20% of non-exporters has attracted funds to develop their business in the last 3 years. On average more than half of the attracted funds, were gained from one of the banking services, such as a bank overdraft, loan or credit. The second largest contribution to the overall amount of funding was provided by the EU programs. Exporting enterprises tend to raise larger funding from sources other than the enterprise's profits.

Exporters tend to be more innovative than non-exporters. 29% or every third exporter invests considerable resources in research and development of new products, while only 14% of non-exporters do this. Finding the cost effective production method is a motivation for investing in research and development of 30% exporters and 14% of non-exporters. The most common type of innovation is “a new or significant improved good or service that is new in the represented market”.

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THE IMPACT OF THE TAX AND BENEFIT SYSTEM ON THE LABOUR SUPPLY IN LATVIA

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*The author gratefully acknowledges financial support from the National Research Programme SUSTINNO

Abstract. When formulating the tax and benefit policy rules, it is crucial to understand the labour supply behaviour, in particular, the influence of changes in the tax and benefit system on the individual`s decision making to participate in the labour market. The research presents the structural labour supply model that allows estimating the effect of gains to work on the participation probabilities in Latvia, thereby the effect of the recent tax and benefit reforms on the changes of labour supply in Latvia. Gains to work are defined as the difference between net wage and the amount of lost benefits due to taking up a job.

A classical Heckman model is used to impute the hypothetical wage for those actually not working on the basis of the observed employees' wage rates. The amount of benefits out of work are observed only for those who are not working, while the calculation of these measures for working individuals requires the detailed coding of the Latvian tax and benefit system provided by a tax and benefit microsimulation model EUROMOD. For the structural probit equation the author uses the same set of independent variables as in the selection equation of Heckman sample selection model, and, in addition, individual gains to work. The data used in the empirical analysis is the EU-SILC, years 2011-2015. The research results will allow policy makers to determine the tax-benefit reforms should be carried out in order to increase the participation level of the different groups of workers.

Key words: *EUROMOD, microsimulation model, participation level, Heckman model, probit.*

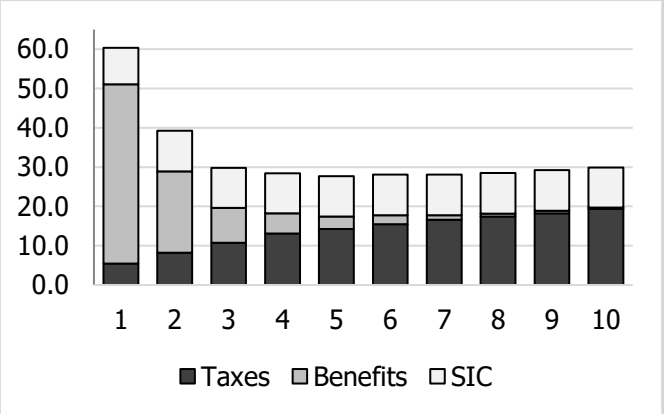
JEL code: C15, H31, J21.

Introduction

Inactivity and unemployment rates persist to be high in Latvia with 7.6% of registered unemployed and 23.7% of economically inactive population aged 15-64 in 2016. Unemployment rate for males is 11.2% and is higher than unemployment rate for females (8.6%), while the opposite is in force for the shares of economically inactive population with 21.2% economically inactive males and 26% economically inactive females aged 15-64 (Central Statistical Bureau of Latvia, 2017). Unemployment rate in Latvia significantly increased during the financial and political crisis 2008-2010, from 8% in 2008 and reaching the top rate of 19.8% in 2010. Despite the general trend of the unemployment rate and the share of inactive population to fall, Latvia needs for effective policies for boosting employment. When formulating the tax and benefit policy rules, it is crucial to understand the labour supply behaviour, in particular, the influence of changes in the tax and benefit system on the individual`s decision making to participate in the labour market. There is a wide range of studies showing that the participation probabilities depend on the level of expected net market earnings and expected net changes in transfers due to taking up a job (e.g., Benczur et al., 2012; Bicakova et. Al., 2011, Siebertova et. al., J, 2013).

Latvian tax and benefit system creates low incentives to take up a job, especially for potential low-income earners (BICEPS, 2014). Participation tax rate (PTR) is one of the measures of the financial incentives to start working and is defined as the proportion of total gross earnings lost in the form of tax and withdrawn benefits when a person enters

employment (Mirlees et al, 2012; Brewer et. al., 2010). Figure 1 shows the distribution of PTRs by deciles of the equivalised disposable income. Individuals in the lowest deciles of income distribution face the highest PTRs and the lowest incentives to start working paid job, which is mainly due to the withdrawn means-tested benefits making up the largest contribution to the PTRs. Low work incentives for low-income earners increase the poverty trap and exacerbate the problem of informal economy (World Bank, 2013).



Source: author`s calculation using EU-SILC 2015 and EUROMOD-LV
Note: Household disposable income is allocated to individuals living in the same household using the modified OECD equivalence scale - with weights of 1.0, 0.5 and 0.3 assigned to the household head, each other household member aged above 13 and each member aged below 14, respectively.

Fig. 1. **Contribution of taxes, benefits and social security contributions (SSC) to mean PTRs by deciles of equivalised disposable income, 2014, percentage points**

The aim of the research is to estimate the impact of the tax and benefit system on the changes in labour supply. The research presents the structural labour supply model that allows estimating the effect of gains to work on the participation probabilities in Latvia, thereby the effect of the tax and benefit reforms on the changes of labour supply in Latvia. Gains to work are defined as the difference between net earnings and the amount of the lost benefits due to taking up a job.

A classical Heckman model is used to impute the hypothetical earnings for those actually not working on the basis of the observed employees' earnings. The amount of benefits out of work are observed only for those who are not working, while the calculation of these measures for working individuals requires the detailed coding of the Latvian tax and benefit system provided by a tax and benefit microsimulation model for the European Union EUROMOD. EUROMOD enables researchers and policy analysts to calculate, in a comparable manner, the effects of taxes and benefits on household incomes and work incentives for the population of each EU country (University of Essex, 2014). Using EUROMOD, individual and household tax liabilities and benefits entitlements are simulated under the existing or hypothetical policy rules in the state. Along with calculating the effects of actual policies, EUROMOD is also used to evaluate the effects of tax-benefit policy reforms on changes of poverty rates, income inequality, work incentives and government budgets (University of Essex, 2014) and to simulate the effects of proposed, alternative or hypothetical policy changes, as well as for exploring the implications of alternative economic or demographic scenarios at national and EU levels (Sutherland, Figari, 2013). EUROMOD is a static microsimulation tax-benefit model, i.e., the short-term (first round) effects of the changes in the tax and benefit system is being modelled.

Structural probit equation is used for the labour force participation modelling. For it the author uses the same set of independent variables as in the selection equation of Heckman sample selection model, and, in addition, individual gains to work. The data used in the empirical analysis is the EU statistics on income and living conditions (EU-SILC), years 2011-2015 (corresponds to income years 2010-2014). EU- SILC survey provides the cross-sectional data on household and individual level provides information on income, living conditions, social exclusion and poverty.

The novelty is argued with the several arguments. The complex impact of the tax and benefit system on the changes in the labour supply in Latvia is being evaluated for the first time. The tax and benefit microsimulation model EUROMOD is being used as an important methodological tool for the labour supply structural modelling for Latvia. Several EU-SILC survey databases 2011, 2013, 2014 have been adjusted for using in EUROMOD for this study (until now only EU-SILC 2008, 2010, 2012 and 2015 databases were available). The research results will allow policy makers to determine the tax-benefit reforms should be carried out in order to increase the participation level of the different groups of workers.

The results presented here are based on EUROMOD version G4.0+. EUROMOD is maintained, developed and managed by the Institute for Social and Economic Research (ISER) at the University of Essex, in collaboration with national teams from the EU member states. I am indebted to the many people who have contributed to the development of EUROMOD. The process of extending and updating EUROMOD is financially supported by the European Union Programme for Employment and Social Innovation 'Easi' (2014-2020). The results and their interpretation are the author's responsibility.

The author gratefully acknowledges financial support from the National Research Programme SUSTINNO.

Research results and discussion

For the labour supply modelling, the author follows the approach presented in Benczur et al. (2012) and Siebertová (2013) – working papers of National Banks of Slovakia and Hungary – described below stepwise.

Employment status (employed/non-employed) is used as a dependent variable in the structural probit model. Employed/non-employed status of an individual is defined based on the positive employee earnings in the reference period. The main dependent variable in the structural labour supply model is gains to work, which is defined as follows:

Gains to work = expected full time net wage – hypothetical transfers that are lost when taking up a full time job [1]

A classical Heckman model is used to impute the hypothetical earnings for those actually not working on the basis of the observed employees' earnings. Following Galuščak & Katay (2014) and Löffler et al. (2014), the author also uses the predicted values of earnings obtained from Heckman sample selection model for employed individuals instead of the observed ones in order to avoid selection bias associated with different treatment of earnings for the employed and the non-employed. Using the hypothetical gross annual earnings for both employed and non-employed and EUROMOD, the simulated net in-work income is computed as a sum of the net employment income, non-labour income and simulated amount of transfers that an individual is entitled to at a given level of income.

The amount of benefits out of work are observed only for those who are not working, while the calculation of these measures for working individuals requires the detailed coding of the Latvian tax and benefit system provided by a tax and benefit microsimulation model for the European Union EUROMOD. For the simulation of out-of-work net income for employed, the author assumes the hypothetical scenario when income from employment is set to zero (non-labour income is left at its original level) and the corresponding amount of transfers an individual is entitled to is simulated. Out of work income for non-employed is also being simulated by EUROMOD assuming the full- take-up of the means-tested benefits, while in reality some eligible persons do not apply for the means-tested benefits because benefits are rather small (Zasova A. & Rastrigina O., 2017).

1. The prediction of the net labour income for non-working

Estimates of the wage model undertaken using the ordinary linear regression will be biased by the fact that for non-employed we cannot observe the earnings they would have if they were employees. Heckman sample selection model (Heckman, 1976; Heckman, 1979; Stata, 2016) allows correcting for selection bias, when the proper randomization is not achieved and the sample obtained is not representative of the population intended to be analyzed. Heckman model is used

to predict the hypothetical annual earnings for those actually not working on the basis of the observed workers' annual earnings.

Heckman proposed to divide the model, suitable for the employment income assessment, into two components: binary choice model for the participation, in our case selection into employees status, and a linear model for the intensity of participation or the size of the employment income. The factors of these two models generally may be different.

In the first stage, the binary choice selection model is formulated, based on economic theory, for the probability of working as employee (takes value of 1 for employee; otherwise takes value of 0). The canonical specification for this relationship is a probit regression. Individual makes a decision to work when their personal reservation wage is lower than the wage offered by employers. In the second stage, the specified wage equation corrects for self-selection by incorporating a transformation of these predicted individual probabilities as an additional explanatory variable (McArdle J.J. & Ritchard G.,2014). See Hazans (2008) for an application of Heckman sample selection model to the Latvian labour market.

Setup of the sample. We restrict the sample to males and females aged 15-64, excluding those with positive annual employment income below the monthly gross minimum wage and excluding those with annual employment income above the 99th percentile, excluding those in education, those with self-employment income, old-age benefits, survivor`s benefits and disability benefits..

The dependent variable of the earnings equation is annual gross employee cash or near cash income that refers to the monetary component of the compensation of employees in cash payable by an employer to an employee (European Commission, 2014). It includes the value of any social contributions and income taxes payable by an employee or by the employer on behalf of the employee to social insurance schemes or tax authorities. To make the positively skewed distribution of wages more normal a log transformation is made.

The dependent variable of the selection equation is the employment status, i.e., being employed or non-employed. Employed /non-employed status of an individual is defined based on the positive employee earnings (refers to annual gross employee cash or near cash income according in the EU-SILC survey) in the reference period. Observations for which dependent variable is not missing are assumed selected, and those for which dependent variable is missing are assumed not selected.

The annual gross earnings (log-transformed) are assumed to be a function of age, age squared, education level, degree of urbanisation of the region the individual lives in (Riga, other cities or thinly populated area), marital status, and the income reference year, whereas the likelihood of being employee, i.e. the likelihood of the earnings being observed, is a function of earnings of other individuals (labour income) living in the same household, other (non-labour) income of all individuals living in the same household, number of children below age of 3, dummy for interest repayments on mortgage and (implicitly) the expected earnings (via the inclusion the factors, which are thought to determine the wage).

The selection equation should contain at least one variable that is not in the outcome equation. Instrumental variables for the selection equation include earnings of other individuals (labour income) living in the same household and other (non-labour) income of all individuals living in the same household, number of children below age of 3, dummy for interest repayments on mortgage. Earnings (labour income) of other individuals living in the same household include employee net income (employee net cash or near cash income) and self-employment net income (net cash benefits or losses from self-employment) observed from the survey data.

Other (non-labour) income of all individuals living in the same household include the following components in net terms: pension from individual private plans; old-age benefits; survivors` benefits; sickness benefits; disability benefits; education related allowances income from rental of a property or land; interest, dividends, profit from capital investments in unincorporated business; family/children-related allowances.

The first Step of Heckman model is the selection into status of employee (see Table 1). The effect of the age on the probability being employed as employee is statistically significant. There is an inverted U-shape relationship between age and the probability of being employed as employee: other conditions being equal, the probability increases until the male reaches age 39 and a female reaches the age 44, subsequently the probability decreases. This is in line with findings by Hazans (2007: Table 1.3; 2008: Table 2).

Table 1

Potential Wage for the Unemployed computed via Heckman Two Step Wage Regression

	Males		Females	
	coef.	sig. level	coef.	sig. level
Annual gross earnings (ln, EUR)				
Education (ref. Not completed Primary, primary)				
Education level: Secondary	0.168	*	0.140	
Education level: Tertiary	0.542	***	0.605	***
Age	-0.020	***	-0.012	***
Age^2 (coef. × 100)	0.032	***	0.015	***
Degree of urbanization (ref. Rīga)				
Other cities	-0.076	***	-0.162	***
Thinly populated area	-0.128	***	-0.147	***
Marital Status (ref. Single)				
Married	0.168	***	0.047	***
Separated, Divorced, Widowed	0.060	**	0.012	
Number of months spent in full-time employment	0.137	***	0.136	***
Number of months spent in part-time employment	0.058	***	0.064	***
Constant	6.680	***	6.611	***
Select				
Education (ref. Not completed Primary, primary)				
Education level: Secondary	0.351	**	0.848	***
Education level: Tertiary	0.855	***	1.428	***
Age	0.084	***	0.081	***
Age^2 (coef. × 100)	-0.108	***	-0.092	***
Degree of urbanization (ref. Rīga)				
Other cities	0.026		-0.100	**
Thinly populated area	-0.195	***	-0.205	***
Marital Status (ref. Single)				
Married	0.283	***	-0.142	***
Separated, Divorced, Widowed	0.107	**	0.066	
Number of children below age of 3	0.424	***	-0.670	***
Non-labour income of all individuals living in the same household, ln	-0.034	***	-0.019	***
Earnings of other individuals living in the same household, ln	0.109	***	0.070	***
Paying interest repayments on mortgage (dummy)	0.370	***	0.138	***
Constant	-1.554		-1.935	***

Source: Author's calculations using EU-SILC 2011 - 2015 data (2010 - 2014 income)
Note: Other controls: Year dummy.
(1) Specification for men: (a) Wald chi2 (14) = 4506.69 Prob>chi2=0.0000 (b) LR test of indep. Equations (rho=0): chi2(1) = 115.61, Prob > chi2 = 0.0000
(2) Specification for females: (a) Wald chi2 (14) = 5865.45 Prob>chi2=0.0000 (b) LR test of indep. Equations (rho=0): chi2(1)=68.01, Prob>chi2=0.0000
The reported model χ^2 test is a Wald test that all coefficients in the regression model (except the constant) are 0. The hypothesis is rejected.
The likelihood-ratio test is an equivalent test for $\rho = 0$.The LR test clearly justifies the Heckman selection model with these data.

The probability being employed as employee increases with the improving the level of education all other conditions being equal. This is in force for both – males and females. However, on average the higher level of education obtained by females has a stronger effect on probability of being employed as employee.

Males and females living in Riga have, on average the highest probability to be employed, and those living in thinly populated area in Latvia –the lowest probability to be employed, all other conditions being equal.

Being married positively affects the employment probability for males, but the opposite is true for females. By contrast, number of children of pre-school age decreases the probability of being employed for females, while it has a positive effect for men (this is in line with Hazans, 2007: Table 1.3).

As expected according to the theory of labour supply, an increase in the non-labour income level of all individuals living in the household on average reduces the probability to be employed as employee for both males and females. However, labour income of other individuals living in the same household has an opposite effect.

The second step of Heckman sample selection model is a linear regression with a dependent variable of annual gross earnings (in logarithm). Similarly to the age effect in selection model, the age effect follow the inverted U-shape form in the earnings equation, with the maximum at the age of 32 for men and at the age of 39 for women (this is largely in line with results in Hazans 2008: Table 4). Improving the education level on average positively affects the earnings level for both males and females, all other conditions being equal.

Other things equal, earnings of individuals living in Riga are higher than of those living in other cities or thinly populated areas.

Being married has a stronger positive effect on the average earnings level for males and females, as expected by the economic theory.

Table 2 reports the hypothetical full-time annual gross earnings for those actually not working predicted on the basis of the observed employees` earnings. As expected, these hypothetical annual gross earnings for non-employed in the sample are, on average, lower than those enjoyed by employed (EUR 7062 vs EUR 8234 for males and EUR 5584 vs EUR 6577 for females).

Table 2

Observed and predicted annual gross earnings via Heckman selection model: males and females, 2010-2014, EUR

	Males		Females	
	Mean (EUR)	Sample size	Mean (EUR)	Sample size
Observed annual gross earnings of the employed (working on average 11 months full-time)	8234	10777	6577	13212
Predicted annual gross earnings for the employed	9436	10777	7118	13212
Predicted annual gross earnings for non-employed working on average 11 months full-time	7062	2218	5584	2846
Predicted annual gross earnings for non-employed working on average 12 months full-time	8050	2218	6365	2846
Predicted annual gross earnings for employed working on average 12 months full-time	10411	10777	8329	12552

Source: Author's computations using EU-SILC 2011-2015 data (2010-2014 income)

2. Gains to work

Gains to work (hereafter GTW) are defined as

- For working individuals - as the sum of net wages and the amount of the lost benefits due to taking up a job. For validation purpose the GMI and housing benefit is shared among household members (these benefits are granted to the whole family taking into consideration the income of all family members). In this study, out of work income

corresponds to log-run out of work income, thereby does not include unemployment benefits. EUROMOD allows us to simulate the amount of means tested benefits, i.e., Guaranteed Minimum Income benefit and housing benefit (please, see chapter 3 section 2 for the EUROMOD scope of simulation in Latvia) the person gets.

- For a non-working individual - as the difference of the predicted net wage using Heckman selection model and actual benefits person gets when unemployed. The author decides to use the simulated amount of benefits based on the EU-SILC data, in order to apply the same methodology for the computation of benefits as for the working individuals. For a non working individual, EUROMOD allows to simulate the rights to get GMI benefit and housing benefits for the household the person lives in, unemployment benefit. Unemployment related benefits like stipends are not simulated due to the lack of information on participation in either training or public works programme; information on unemployment related benefits is taken from the survey data.

The key challenge is to determine:

(1) how much would working individual receive in benefits if that individual is laid off?

(2) how much would currently not-working lose if that individual takes up a full time job?

For this purpose we use the detailed coding of the full transfer system available in EUROMOD.

In Latvia, the means-tested benefits, i.e., guaranteed minimum income benefit and housing benefit, are applied to a person or household, if net income per household member is below the certain level of income (Zasova A., Rastrigina O., 2017). According to these specific rules of Latvian tax-benefit system, gains to work are calculated for each individual as the difference between net earnings of all members in the household and the amount of lost benefits of all members in the household due to individual is taking up a job.

Table 3 below presents the descriptive statistics of estimated monthly gains to work of non-employed and employed by years 2010-2014. As it was expected, the mean value of estimated gains to work of employed exceed the mean value of estimated gains to work of non-employed.

Table 3

Descriptive statistics of estimated monthly gains to work of employed and non-employed, 2010-2014, EUR

	Non-employed			Employed			Gross minimum monthly wage	Net minimum monthly wage, employee without dependents
	Sample size	Mean	p50	Sample size	Mean	p50		
2010	1342	339	331	4981	419	410	256	185
2011	1127	370	355	4692	455	449	285	206
2012	945	406	392	4620	497	499	285	206
2013	910	455	431	4566	539	539	285	208
2014	740	517	485	4470	627	616	320	236

Source: Author's computations using EU-SILC 2011-2015 data (2010-2014 income) and EUROMOD_LV.

3. Structural labour supply model

The main dependent variable in the structural labour supply model is *gains to work*, which is defined as follows:

Gains to work = net wage - the amount of lost benefits due to taking up a job.

Net wages depend on the tax system in force in the state and are observable only for working individuals. The author uses a classical Heckman model to impute the hypothetical gross earnings for those actually not working on the basis of the observed employees' earnings. The amount of benefits out of work are observed only for those who are not working, while the calculation of these measures for working individuals requires the detailed coding of the Latvian tax and benefit system provided by a tax and benefit microsimulation model EUROMOD.

The structural labour supply model will explain the choice between two options: not working as employee and working as full-time employee (for simplicity ignoring self-employment and part-time employment). For the structural order probit equation the author uses the same set of independent variables as in the selection equation of Heckman sample selection model and, in addition, individual gains to work (in logarithmic form). Structural labour supply model will allow estimating the effect of gains to work on the participation probabilities, thereby the effect of the recent or planned tax and benefit reforms on the changes of labour supply in Latvia.

The main results of the structural labour supply model are reported in Table 4. The marginal effects from the estimated structural labour supply model are evaluated at subgroup-specific means. Computed results are statistically significant and show, that increase in gains to work and labour income of other household members increases the probability of being employed for males and females, while the increase of non-labour income of all household members decreases the probability of being employed. A ten percent rise in gains to work increases the individual probability of being employed by 0.324 percentage points for males and 0.562 percentage points for females. This proves that the participation probabilities of females on average are more sensitive to the changes of labour tax and benefits system that males. For males and females alike, the effects of rise of labour and non-labour income of other household members on the participation probability are smaller that the effects of gains to work.

Marginal effects by age groups. The estimated effects vary by sub-groups. When the youth (aged below 25), prime age (aged 25-54) and elderly (aged 55 and more) are compared, it appears that the highest responsiveness to the labour tax and benefit system is observed among of both genders, as well as among females above age of 55 (Table 4).

Table 4

Effects of gains to work and other household members' income on participation probability, by gender and age group

	Males		Females	
	dy/dx	*std.err*	*dy/dx*	*std.err*
Marginal effects for the full sample				
Gains to work	0.0324	0.0076	0.0562	0.0132
Non-labour income of all household members	-0.0088	0.0014	-0.0053	0.0015
Labour income of other household members	0.0204	0.0013	0.0140	0.0014
Marginal effects of gains to work by age groups				
Prime age (25-54)	0.0303	0.0071	0.0497	0.0117
Elderly (>=55)	0.0330	0.0078	0.0733	0.0173
Youth (age <25)	0.0471	0.0111	0.0833	0.0196

Note: marginal effects are evaluated at sub-group specific sample means.

Table 5 presents marginal effects of gains to work computed for educational subgroups within the prime-age sub-sample, marginal effects of gains to work by education level within the prime-age sub-sample, marginal effects for the sub-groups classified by marital status, marginal effects computed for the three subgroups of prime-age individuals by degree of urbanization (those living in Riga, living in other cities and those living in thinly populated area) and marginal effects for the sub-groups of prime age individual divided by income levels, here represented by the employment income quintiles. Main conclusions are reported in the section of conclusion.

Table 5

Marginal effects of gains to work on participation probability, by marital status, education level, degree of urbanization and income quintiles

	Males		Females	
	dy/dx	*std.err*	*dy/dx*	*std.err*
Prime age, married	0.0308	0.0072	0.0668	0.0158
Prime-age, single	0.0323	0.0076	0.0344	0.0081
Prime age, not married, and having at least one child of age below 3			0.0702	0.0100
Prime-age, not completed primary or primary education	0.0532	0.0125	0.1009	0.0240
Prime-age, secondary education	0.0386	0.0090	0.0599	0.0141
Prime-age, tertiary education	0.0190	0.0045	0.0198	0.0049
Prime age, living in Riga	0.0253	0.0060	0.0393	0.0094
Prime age, living in other cities	0.0305	0.0072	0.0422	0.0101
Prime age, living in thinly populated area	0.0343	0.0080	0.0615	0.0145
Prime age, income quintile Q1	0.0401	0.0094	0.0710	0.0166
Prime age, income quintile Q2	0.0345	0.0080	0.0559	0.0129
Prime age, income quintile Q3	0.0281	0.0065	0.0469	0.0109
Prime age, income quintile Q4	0.0206	0.0049	0.0328	0.0081

Note: marginal effects are evaluated at sub-group specific sample means.

Conclusions

This research is aimed to estimate the impact of the tax and benefit system on the changes in labour supply. The research presents the structural labour supply model that allows estimating the effect of gains to work on the participation probabilities in Latvia, thereby the effect of the tax and benefit reforms on the changes of labour supply in Latvia. Gains to work are defined as the difference between net earnings and the amount of the lost benefits due to taking up a job.

The contribution of the study is in assessing, for the first time, the complex impact of the tax and benefit system on the changes in the labour supply in Latvia. The tax and benefit microsimulation model EUROMOD is being used as an important methodological tool for the labour supply structural modelling for Latvia. EU-SILC survey databases for years 2011, 2013, 2014 have been adjusted for using in EUROMOD for this study (until now only EU-SILC 2008, 2010, 2012 and 2015 databases were available). The main findings are as follows:

- The estimated sensitivity to the changes of labour tax and benefits system vary by sub-groups. The lowest responsiveness to the labour tax and benefit system is observed in a prime-age group of males and females, while the highest responsiveness – in a group of individuals below age of 25.
- The participation sensitivity to the changes of labour tax and benefits system substantially decrease with the increase of educational level.
- The overall responsiveness of females is larger than of males. Prime-age married males shows the smallest elasticity.
- Married prime-aged females are two times more sensitive to the changes in tax and benefit system than single ones.
- The lowest responsiveness is observed among males and females living in Riga, while individuals living in thinly populated area are the most sensitive to changes in a tax and benefit system.
- For both genders, low income earners are more responsive to changes in tax and benefit system than high-income earners.

The research results allow to identify the types of tax-benefit reforms which are likely to have the strongest effect on participation level among the different groups of workers. The tax and benefit system instruments are the most effective

in the increase of the participation level in the labour market for those population groups, which are found to show the highest responsiveness of the participation probability to the changes of the tax and benefit system (measured with the marginal effects of gains to work in this study). This implies that labour market policies that are aimed to boost employment should be primarily targeted at the following groups

- Males below age of 25; males of prime-age, with not completed primary or primary education, males living in thinly populates area, low-income earners
- Females below age of 25 and elderly (above 55); females of prime-age, not completed primary or primary education, married females, not-married females of prime age having at least one child below age of 3, females living in thinly populated area, low-income earners.

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ETHNICITY IN POPULATION CENSUSES AND ADMINISTRATIVE REGISTER: THE CASE OF LATVIA

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Abstract. Latvia is one of the ethnically diverse countries in the European Union (EU), where the share of ethnic minorities makes up around 38% of the total population in Latvia (Central Statistical Bureau, 2016). Moreover, Latvia together with Estonia are the only members of EU that collect information on the ethnic background of the population at the official level. When registering a new-born child, information on the ethnicity of the child and its parents is recorded in the birth certificate – based on this document information is entered in the Population Register. Additionally, when receiving a passport, a person may choose to include 'ethnicity record' in the document.

Until now a small number of studies in Latvia analysed the methodology of the Population Census and vital registry from the perspective of ethnicity (e.g. B. Mežgailis, V. Gailītis, I. Mežs, P. Zvidriņš, A. Bērziņš, etc.). Therefore, the aim of the study is to analyse the differences in ethnic data collection between Population Censuses & Register by analysing the results related to ethnicity as listed on the last Population and Housing Censuses in 2000 and 2011 (ethnical structure of population and other variables), as well as the information provided by the Population Register for the same period of time.

The main differences between both data sources appears in the fact that data on ethnicity in the Population Census 2011 were collected based on the responses of respondents (self-rated ethnicity), whereas in the Population Census 2000 information on ethnicity was processed from Population Register (documented ethnicity), which provided for avoidance of the problem of numerator-denominator bias when performing calculation on demographic processes. The same approach – documented ethnicity – will be performed in the Population Census 2021 as it will be implemented based only on administrative data sources.

Key words: *ethnicity, population*, *population census, register*

JEL code: O15

Introduction

In most of the multi-ethnic countries the only source to collect data on the ethnic background are population censuses or some socio-demographic surveys, whereas in Latvia information on ethnicity is also possible to obtain from the administrative registers. Questions on 'ethnicity' at the state level appeared in 1918 after the proclamation of the Republic of Latvia and the establishment of the "Tautas padome" (People's Council of Latvia). Since that period, information on the ethnic background of a person in Latvia has been registered in vital statistics and declared in all ten population censuses (since 1920). The legitimacy of ethnic minorities was restored after Latvia regained its independence by implementing the 1991 Law "On the Unrestricted Development and Right to Cultural Autonomy of Latvia's National and Ethnic Groups". In addition, the Population Register of the Republic of Latvia was established in 1998 as well as two Population Censuses in 2000 and 2011 were organised – where the following variables are used to describe the ethnic situation in the country: ethnicity, language use, nationality (and type thereof) and place of birth. However, until now a small number of studies in Latvia explored the methodology of Population Censuses and vital registry from the perspective of ethnicity (e.g. B. Mežgailis, V. Gailītis, I. Mežs, P. Zvidriņš, A.Bērziņš, etc.).

The aim of the study is to analyse the differences in ethnic data collection between Population Censuses and the administrative data sources (Register), as well as the aspect of the methodology and data collection process in these information sources. Within the study the question of what the data collection differences are about ethnicity? – is raised.

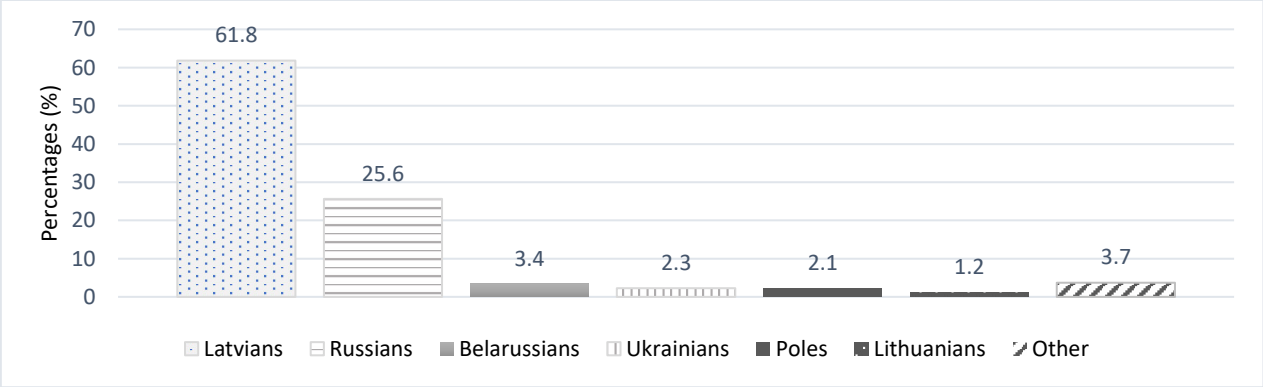
Data and methods: the study is focused on the analysis of the results related to ethnicity of the last Population and Housing Censuses in 2000 and 2011 (ethnical structure of population and other variables) as well as the information provided by the Population Register for the same period of time. Considering the fact that the upcoming Population Census 2021 will be based only on the administrative data sources, authors are analysing the possibility to obtain data on ethnic background from the Population Register to the year 2016 (examples of calculations of employers and employed persons by ethnicity is given). To collect the qualitative information the literature review and semi-structured interviews (consultations) with related experts from the Central Statistical Bureau (CSB) Latvia and the Office of Citizenship and Migration Affairs was conducted.

The preliminary results show that a higher number of persons declared Latvian and Russian ethnicity in Population Census 2011 than was included in the Population Register, due to the fact that data on ethnicity in the Population Censuses were obtained based on the answer of respondents or members of household.

Research Results and Discussion

1. Role of Ethnicity in the Population of Latvia

Latvia is one of the most ethnically diverse countries within the European Union and beyond. The ethnic composition of the population has been formed by different historical eras in the territory of the present Latvia: German period, Swedish Empire, Polish-Lithuanian Commonwealth, Russian Empire, Soviet Times and times of independence. Besides, over the last 85 years ethnic composition of population has been changed significantly – in 1935 share of ethnic minorities was 23% of the total population (Krumins, 2001), and the current proportion of ethnic minorities has reached 38% (749 thous.) caused mainly due to the emigration of workforce during the Soviet Times (see Fig.1).



Source: author's construction based on data from the Central Statistical Bureau of Latvia

Fig.1. **Share of the population by ethnicity (2016, at the beginning of the year)**

Despite the shrinking number of the total population since the beginning of 1990s in Latvia as a result of negative net migration and negative natural increase, the share of Latvians is slowly increasing, whereas the share of minority groups is constantly decreasing (Zvidriņš, Ponomarjova, 2017). According to the data of the Central Statistical Bureau of Latvia (CSB), the total number of the population in 2016 was 1.96 mln., and among them the largest ethnic groups are Russians, Belarussians, Ukrainians and Poles (for more detailed information see Table 1).

Table 1

Ethnical composition of the population in 2016 (thous.)

Total	Latvians	Russians	Belarussians	Ukrainians	Poles	Lithuanians	Other
1 968	1 216	504	65	44	41	23	72

Source: Central Statistical Bureau of Latvia, resident population at the beginning of the year

Another aspect analysed together with ethnicity is the status of the citizenship of persons living in Latvia (resident population) that highlights the uniqueness of the country. Latvia together with Estonia are the only countries of the EU where individuals are classified as non-citizens (holding a non-citizen passport). 'Non-citizens of the Republic of Latvia' are those persons who were USSR citizens but who after 1991 did not qualify for Latvian citizenship as well as not acquiring Russian or any other citizenship (based on the Law on the Status of Former USSR Citizens who are not Citizens of Latvia adopted in 1995). This is a special category of inhabitants who are more than permanent residents, but not yet citizens (Krūma, 2014). Therefore, in the case of these countries terms 'nationality' and 'citizenship' should be seen separately.

Currently, around 13.89% of the total population are non-citizens, of which 11% (231.1 thous.) are not citizens of Latvia or any other country and 2.89% (56.8 thous.) – represent citizens of other countries (mainly citizens of Russia, Lithuania, Belorussia). The largest non-citizens group in Latvia is Russians (66% of all non-citizens or 153.1 thous.) and Belarussians (14.3% or 33.1) (see Table 2).

Table 2

Resident population by ethnicity and citizenship (2016)

	Citizens of Latvia		Non-citizens of Latvia		Citizens of other countries (foreigners)	
	thous.	%	thous.	%	thous.	%
Totally	1 680.0	100	232.1	100	56.8	100
Latvians	1 215.2	72.3	0.5	0.2	0.7	1.2
Russians	316.9	18.9	153.1	66.0	34.4	60.6
Poles	32.0	1.9	8.4	3.6	1.2	2.1
Belarussians	27.5	1.6	33.1	14.3	5.4	9.5
Lithuanians	16.2	1.0	5.8	2.5	6.3	11.1
Others	72.1	4.3	31.3	13.5	8.8	15.4

Source: Central Statistical Bureau of Latvia, Table ISG 093
Note: Population at the beginning of the year is given in the table

2. Legislative Regulation on the ethnicity data collection

2.1. Ethnicity record in documents

There are two documents where 'data on the ethnicity' could be obtained from in Latvia: (1) birth certificate and (2) passport (where ethnicity is among optional information entered in the document).

Birth of a child is registered in Latvia if at least one parent is a permanent resident of the Republic of Latvia. According to the Law on Registration of Civil Status Documents, birth fact is registered (notified) by one of the parents. If mother and father of a child are not officially married, presence of both parents is required (Platace, 2013). Parents may decide about 'ethnicity' entry in the certificate – ethnic background of child's parents or grandparents (relatives of the child in direct ascending line within two generations) should be chosen (if it's possible to prove information based on the documents). Therefore, the ethnicity of children born in a multi-ethnic family is determined pretty subjectively and depending on the person providing information. Ethnicity entry is recorded in compliance with the Classification of

Ethnicities where the newest version was approved by the Cabinet of Ministers of the Republic of Latvia in 2016. Currently, the classification includes 202 different categories as well as 2 additional categories for "not specified" and "unknown" ethnicity.

In the case of parents who decide NOT to identify information about ethnicity, category "not specified/not chosen" or "unknown" (e.g. if one of the parents is unknown) is entered. After reaching age 15, when receiving the passport, a person may decide whether to specify 'ethnicity' or not.

"Ethnicity" entry in the form of birth certificate appeared in 2013 when Regulations on Registers of Civil Status Documents were adopted by the Cabinet of Ministers (Regulation No.761, 3 September 2013), earlier ethnicity of child was entered directly into the Birth Register, whereas the certificate reflected only information of parents' ethnicity.

The tradition of keeping an ethnicity record in the Latvian passport comes from the Soviet Times where it was among mandatory records in the document. The record was abolished for the period of time 2012- 2013. However, after the long discussions in the Parliament of Latvia in 2013 the agreement was reached to provide an optional choice to keep ethnicity recorded in the passport.

The Law on the Change of a Given Name, Surname and Ethnicity Record (adopted in 1994 and 2009) establishes the detailed procedure on the change of record – a person after reaching the age of 15 is allowed to change the ethnicity record once (with exception when record has been changed before reaching legal age) to the direct ascending line thereof within the limits of two generations (parents and grandparents), if this person can prove the belonging to this line of relations. Therefore, more reliable data on ethnic background are of adult population.

Based on the information provided in the birth certificate, 'ethnicity record' is entered in to the Birth Register and centralised Population Register of Latvia. Additionally, the certificate includes information on place of birth, nationality as well as the ethnicity and nationality of a person's parents. A passport is issued based on the information of ethnic background included in the Population Register.

Concluding abovementioned, tradition to include 'ethnicity' record in the Register allows to conduct demography research studies – e.g. calculations of ethnic differentiations – according to 'document-based ethnicity' (register-based).

2.2. Legislative base on the Population Censuses and ethnicity

The organisation and other aspects of the Population and Housing Censuses 2000 and 2011 were developed in accordance with the recommendations of the international organisations as well as the requirements of the EU, state, local government and other data users (Statistical Office of Estonia, Central Statistical Bureau of Latvia, et al, 2003).

The methodology, including a range of questions, of the Census 2000 was prepared based on the recommendations of the United Nations Economic Commission for Europe (UN ECE) and Eurostat for the year 2000 Population and Housing censuses. Following the requirements established by the EU legislation, for the first-time population censuses were conducted in all EU Member States in 2011. Thereby organisation of Population Census 2011 was ensured in compliance with the European Parliament and Council Regulation (EC) No 763/2008 of July 9, 2008 on population and housing census as well as the UN ECE recommendations, which provided a list of core and non-core topics and other obligatory requirements for EU Member States which will be still in force for the next Population and Housing Census in 2021.

According to the Recommendations of UN ECE (2000, 2010, 2020), questions on ethnicity, language and religion are considered as a non-core topic, whereas questions on the place of birth and citizenship are among obligatory ones (UN Economic Commission for Europe, 2006).

Additionally, the European Commission Implementing Regulation (EU) 2017/543 (adopted in 22 March 2017) included the technical specifications of the topics and their breakdowns for the next Census and European Commission Regulation (EU) 2017/712 (20 April 2017) establishing the reference year and the programme of the statistical data and

metadata for population and housing censuses. These documents briefly describe issues related to the place of birth and country of citizenship of the person. Despite the fact that a question on the persons' ethnicity is a non-core topic in the Population Censuses, the indicator on ethnicity of inhabitants of Latvia will be still included in the next Population and Housing Census 2021.

In Latvia, for the two last Population Censuses the Law on Population Census was adopted by the Parliament of the Republic of Latvia (*Saeima*) in 1999 and 2009. It determines how the Population Census should be organised and performed, Census objects, information sources, the main performers of Population Census development and field work, rights and obligations of the residents and institutions involved in the Population Census as well as the exploitation of the Census data (Statistical Office of Estonia, Central Statistical Bureau of Latvia et al, 2003; Statistical Office of Estonia, Central Statistical Bureau of Latvia et al, 2015). Detailed information on the questions was provided in special regulations of the Cabinet of Ministers of the Republic of Latvia that included all detailed variables, also ethnicity, that should be acquired within the framework of Population Census in Latvia. For the next Population Census that will be held in 2021 the special legislative act will be prepared and adopted in 2018, moreover the Statistical Law that has been in force since 1st January 2016 regulates the questions on the next Population Census and declares that the next Census should be done based on administrative data sources.

3. Ethnicity in the administrative registers and population censuses

As Population Register was already established at the time of Population Census 2000, the combined data collection methodology was introduced where part of information were obtained by interviewers directly from respondents, but the rest – accumulated in different registers (census-type statistical data were collected).

During the Population Census 2011 for the first time in the history of Latvia respondents had an opportunity to complete computerized census questionnaire which was organised in two ways: 1) respondents filled out online questionnaire by themselves on the Internet or 2) interviewers conducted computer-assisted interviews at resident homes.

In case of both Censuses, answering question about ethnicity respondents had to select one of the answers indicated in this question. During the Population Census 2000, three categories of ethnicity (Latvian, Russian, Belarussian) as well as option "others" were suggested to select, whereas in the online questionnaire of the Census 2011 respondents were invited to select an ethnic group from a list of categories to which they considered they belong. Besides, interviewers of Census 2011 were provided with specific instructions: 'ethnicity' was obtained based on the answer of respondents, even if it was different from that indicated in advance; category of ethnicity was selected from the Ethnicity Classification of Latvia. If respondent was not able to indicate ethnicity of a child, priority to ethnicity of mother was given.

Analysis of approach used to collect data about ethnicity in the main statistical data sources in Latvia shows that only during the Population Census 2011 information about ethnicity was recorded from the answers of respondents – in a self-identification way. Only for 9% of the total population information on ethnicity was obtained during the data processing from the Population Register where in 0.3% of the total cases respondents did not specify ethnicity but in 0.1% – it was indicated as "unknown". A different approach was used in the earlier Census of 2000 – after it was completed all the answers about ethnicity were processed from the Register. The response "Ethnicity not specified" was identified for 5012 individuals or only 0.2% of the total population (Krūmiņš, Ponomarjova, 2016).

In the result, the dataset of Census 2000 provided by CSB allows to perform the census-linked studies on ethnic differentiation processes (such as mortality, fertility and other). The 'document-based' approach will be applied also in the upcoming Census 2021 when data on ethnicity as well as all other variables will be collected from administrative registers (Table 3).

Besides population censuses and administrative registers, question on 'ethnic background' has been regularly included in different national as well as EU-level surveys, such as FINBALT – survey on Health Behaviour among Latvian Adult Population (conducted every two years from 1998 to 2016); European Health Interview Survey (EHIS) of Latvia; Reproductive health of the population in Latvia (2003-2011), etc. Data on ethnicity during the surveys are provided in the self-identification way and represent a certain portion of the population which restricts possibility to conduct precise and comparable socio-demographic studies on ethnicity.

Table 3

Methodology of data collection in Register, Censuses and other data sources

	Documented ethnicity	Self-rated ethnicity	Comments
Population Register	√		Ethnicity is entered based on the information provided in the birth certificate (Birth Register)
Population Census 2000	√		Data on the ethnicity were processed from the Population Register
Population Census 2011		√	Data were processed from the Register only for 9% of the total population
Population Census 2021	√		For the first-time Census will be conducted based on the administrative registers
Socio-demographic surveys		√	Self-identified ethnicity – changing nature

Source: constructed by authors based on the literature review and consultations with experts from CSB and Office of Citizenship and Migration Affairs

In the result of different methodologies used to estimate population of Latvia by CSB and Office of Citizenship and Migration Affairs, some differences in the total number of population and its ethnic composition appeared during the Population Census 2011. As shown in the Table 4, 42 thous. less persons declared Latvian ethnicity and 52.2 thous less persons declared Russian ethnicity than it was given in the Population Register. This difference can be explained by the several reasons: person providing answer comes from ethnically mixed family and this answer is influenced by "emotional feeling"; answer could be given by a member of the household.

Table 4

Difference between declared resident population in Population Census 2011 and registered residency in Population Register

	Total population (thous.)	Latvians	Russians
Pop.Census 2011 (1.03.2011)	2 070 371	1 285 136	557 119
Pop.Register (1.03.2011*)	2 204 861	1 327 241	609 639
Absolute difference (census-register)	-134 490	**-42 105**	**-52 520**

Source: Source: Central Statistical Bureau and Office of Citizenship and Migration Affairs
*Note: * average from data on 1 January and 1 July 2011*

The table 5, provided below, represents a set of questions related to ethnicity which were asked during the population censuses and obtained within the administrative register until now. Among compulsory and key issues, included in the both information sources, are about persons' country of birth, citizenships (both, country and status) as well as ethnicity. In addition, Population Censuses provide possibility to obtain data about mother tongue or language use at home. As data on religion are categorised as sensitive information, question about it was not and would not be included to the analysed information sources.

Table 5

Set of questions included in the Population Register and the Censuses

	Pop.Reg.	PC 2000	PC 2011	PC 2021*
Ethnicity	√	√	√	√
Place of Birth	√	√	√	√
Nationality	√	√	√	√
Citizenship status	√	√	√	√
Language	X	√ a) Mother tongue; b) Language skills	√ a) Language use at home; b) Use of Latgalian language	X
Religion	X	X	X	X

Source: constructed by authors based on the literature review and consultations with experts from Central Statistical Bureau
Note: √- question included in the Population Register and/or Census; X *–question not included in the Population Register and/or Census*
** Final set of questions for Population Census 2021 will approved by the Regulation of Cabinet of Ministers in 2019;*

The Population and Housing Census 2011 was the only census where the questions on the language mostly spoken at home as well as use of Latgalian on daily basis (subtype of Latvian) were asked. According to the results, the most commonly used language at home is Latvian which is used by 62.1% of population, the second popular language is Russian, spoken at home by 37.2% of population. The rest mostly used languages at home are Byelorussian, Ukrainian, Polish, Lithuanian, etc. (spoken by 0.7% of population) (Veģis, 2013). When analysing the distribution of languages spoken at home by Latvian ethnical groups, results shows that most of Latvians use Latvian language at home (1.09 mln. or 89.9% of total population of Latvian ethnic group), whereas 89.5 thous. of Latvians speak Russian at home, which makes 7.3% of total number of Latvian ethnical group. Most of this Latvians are usually persons that come from ethnically mixed families (see Fig.2).

Source: Population and Housing Census 2011; Central Statistical Bureau of Latvia

Fig.2. **Distribution of languages that are spoken by Latvians at home (2011)**

4. Employment and ethnicity: example of administrative data usage

In order to get the insight and example of administrative data use for the Population Census purposes, the labour market from perspective of ethnicity was analysed. Considering that the forthcoming Population and Housing Census in 2021 will be conducted based on the administrative data sources only, the Population Census Division of CSB of Latvia has prepared the methodology to calculate employed persons in Latvia (based on data from the State Revenue Service on tax payers and annual declaration information on earnings of persons per one year) and detection of the employment status (employer, employee or self-employed person). Authors have compared data about economic activity of last two

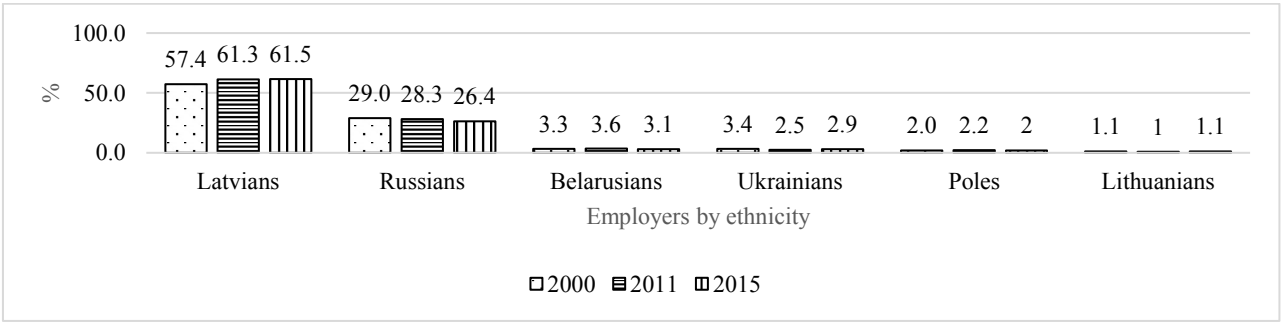
Population Censuses (is the person economically active or employed and what is the current status of employment of that person) and administrative data on 1st January 2016 (based on the data of State Revenue Service about taxpayers and data on unemployed persons or jobseekers from the State Social Insurance Agency are taken into account). Analysed data set shows that in 2015 70.4% of all employed persons were Latvians and 20.3% – Russians, the rest ethnic groups did not exceed 4.5% (see Fig.3).

Source: Population and Housing Census 2000, 2011; Central Statistical Bureau of Latvia and administrative data on 1st January 2016

Fig.3. **Distribution of employed persons by ethnicity in Latvia**

After comparing data from the last two Population Censuses and administrative sources the Fig.3. also demonstrates the increasing tendency of amount of the employed persons between ethnic Latvians as well as decreasing tendency of employed people among Russians.

For analysing the labour market of Latvia, it should be noted that the number of employers who are Latvians increased by 4.1% since 2000 when the proportion of Latvian employers were 57.4% and calculations on 1st January 2016 show that the number of employers Latvians is elevated to 61.5% (see Fig.4.). The data shows that the number of Russian employers was increasing in the recent years, in other ethnicities groups no significant changes appeared since 2000.



Source: Population and Housing Census 2000, 2011; Central Statistical Bureau of Latvia and administrative data on 1st January 2016

Fig.4. **Distribution of employers by ethnicity in Latvia**

Another question that could be analysed based on the administrative sources is self-employment status by ethnicity. Since Censuses 2000 and 2011 a slight decrease in the distribution of self-employed ethnic Latvians was observed – from 71.8% (2000) and 72.1% (2011) to 70.4% in 2015 of self-employed Latvians (see Fig.5.). The identified decrease could be influenced by different methodologies used in last two Censuses as well as in the upcoming Census in 2021. Within the preparation work for new Population and Housing Census 2021 there are acknowledged several differences between definitions of self-employed persons and employers - for example, Latvian legislation declares that a self-employed person can hire up to 5 employees, but for the next Population and Housing Census (according to requirements of the International Labour Organization) the self-employed person should be considered as the 'employer''.

Source: Population and Housing Census 2000, 2011, Central Statistical Bureau of Latvia and administrative data on 1st January 2016

Fig.5. **Distribution of self-employed persons by ethnicity in Latvia**

Conclusions

1. **Latvia**, together with Estonia, are only the countries of the EU that officially records and **collects** data on '**ethnical background**' in the Population Register;
2. As the result of assimilation for ethnic minorities with Latvian ethnic group (and also assimilation with Russian ethnic group for such ethnic groups as Belarusians and Ukrainians), ethnically mixed marriages, low birth rates for minority groups, migration, the **role of ethnicity** in Latvia **is slowly diminishing**;
3. Preferences might be given to the "**native born**" and "**foreign born**" classification in the future;
4. As the data on ethnicity in the Population Register (including birth, death, marriage and other registers) and the Population Census 2000 are recorded based on the documents (document-based ethnicity), it allows to avoid the problem of numerator-denominator as well as to perform ethnic deafferentation studies based on the „census linked approach". The same approach will be possible to use during the upcoming Census 2021 when all the data will be collected from administrative registers;
5. Ethnicity is determined pretty subjectively and depending on the person providing information or environment in which the person grew up and is living;
6. Population Censuses 2000, 2011 and administrative data from 2015 shows percentage of Latvians who are employed and employers. At the same time, there is evidence of a decreasing tendency of Latvians who declare themselves as self-employed persons (except data from 2015 where special calculations were performed). Further investigation is needed.

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THE IMPACT OF ENVIRONMENTAL REGULATIONS ON REGIONAL DEVELOPMENT IN EASTERN ESTONIA

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Abstract. The European Parliament (EP) in 2012 established Sulphur Emission Control Areas (SECA) in Northern Europe including the Baltic Sea where ships from 2015 must not fuel with a sulphur content exceeding 0.1%w/w. Russian-Estonians have had discussions if and how these regulations impact maritime stakeholders and the economy in the Baltic Sea Region (BSR).

Estonia oil shale industry is located in the Eastern part of the country (Ida-Viru County) and represents up to 5% of the national economy. Ida-Viru County is an economic weakly developed region and shares a common border with Russia with majority Russian speaking Estonians. Approximately half of regional workforce is employed directly or indirectly in this industry giving the oil shale industry an important role in the county's economic wellbeing. A large part of shale oil is used for the production of maritime bunker oil. Unfortunately, the sulphur content of shale oil is higher than it is allowed by the SECA regulations. In addition, the low oil price is putting extra pressure on oil sector which endangers the traditional business model of the Estonian oil shale industry.

This paper investigates the impact of the environmental SECA regulations on the Estonian oil shale industry and discusses its consequences on the regional development as well as the economic and social cohesion in Ida-Viru County. Methodically, the research is based on expert interviews, a case study, and a further exploration of potential options to overcome possible economic distortions and to strengthen the social coherence in Eastern Estonia in the frame of the Estonian smart specialisation strategy.

Key words: *innovation, regional development, SECA regulations, smart specialisation*

JEL code: R11, O33, M11

Introduction

Around 90% of the world's cargo is transported by ships and are related to a high magnitude of harmful emissions comprising CO_2, SOx, ODS, VOC and NOx (Unctad, 2015; Jiang, L., Kronbak, J., & Christensen, L.P., 2014). Consequently, the International Maritime Organization (IMO) launched several clean shipping initiatives in order to harmonise emissions legislations among nations to force the shipping industry to operate with the cognisance of the environment. Sulphur emissions (SOx) especially was tackled by the "Regulations for the Prevention of Air Pollution from Ships" in the sixth annexe of the MARPOL (International Convention for the Prevention of Pollution from Ships) Convention of the IMO through the creation of the Emission Control Areas (ECA) with limits for different kinds of emissions in these areas.

In 2012, the European Parliament (EP) established a Sulphur Emission Control Area (SECA) in Northern Europe including the Baltic Sea where ships must use low sulphur fuel content where from 2015, the limit must not exceed 0.1% (Directive 1999/32/EC amended in Directive 2012/33/EU; IMO, 2014). Despite the fact that only about 0.3% of the world's water surface represents SECA currently, the implementation of the regulations has spurred discussions on if or/and how they affect maritime stakeholders as well as the economy in the Baltic Sea Region (BSR). These discussions

gained global interest because the Marine Environment Protection Committee (MEPC) of the IMO decided in October 2016 to reduce SOx content in bunker fuel worldwide to include both SECA and non-SECA to 0.5 % (5,000 ppm) from 2020 (IMO, 2016).

For Estonia, the introduction of SECA regulations represents an issue of national interest since Estonian oil shale industry is an important producer of shale oil, a maritime bunker fuel that contributes up to 5% of the national GDP and about €300 million to the state budget (including employment taxes, environmental taxes). The Estonian oil shale industry is concentrated in Ida-Viru County and plays an important regional role for a County, which is situated in the North-Eastern part of the country at the Russian border. Ida-Viru County represents an economic weakly developed region with about 150,000 inhabitants equipped with the highest unemployment rate in Estonia (13.2%, Estonia: 6.2%), a high labour pressure, a low average regional income (ca. 81% of Estonian average) and the highest concentration of the national majority of Russian-speaking Estonians (ca. 77%) (SYBE, 2015, 2016). Approximately half of the regional workforce is employed directly or indirectly in this industry so that changes in shale oil business will have direct socio-economic consequences (Olaniyi E.O. & Viirmäe, M., 2016). Since the fall of the oil prices in the 2nd half of 2014, the Estonian shale oil has been under economic pressure which was further amplified with the implementation of the SECA regulations since 2015. The Estonian maritime bunker fuel challenge increased because shale oil high sulphur content of about 0.8% which is higher than the SECA regulation limit of 0.1%w/w in the BSR as well as the 0.5%w/w global 2020 limit.

After the Ukrainian crisis in 2014, the integration of the about 25% Russian Estonians became a top issue on the political agenda in the Baltic States. Kivirähk, J. (2014) pointed out that about half of the Russian minority is relatively and completely unintegrated into Estonian society but a higher quality of living in a prosperous, high-tech Estonia than their compatriots in Russia will assuredly bring a foreseeable future loyalty for Estonia their host country (Hockenos, P., 2015). This scenario might change, especially in Ida-Viru County, if the economic frame conditions are lowered especially when the oil shale industry link with the social cohesion in Estonia is considered.

The paper addresses the research question of how the SECA regulations affect the Estonian oil shale industry and discuss the consequences on the regional development including the economic and social cohesion in Eastern Estonia. The authors participate in a European project on the assessment of the impact of SECA regulations on BSR so that the research is based on expert interviews and a case study from Estonian shale oil industry. The results will be discussed in the frame of the Estonian smart specialisation strategy to overcome possible economic distortions and to strengthen the social coherence in Eastern Estonia. The paper is organised as follows: after the introduction, the theoretical background about SECA and environmental regulations, Estonian shale oil industry, regional development and social coherence will be given. This includes a theoretical analysis of the impact of accumulated regulations on business activities of enterprises using the Endogenous growth and Strategic management theories. The system of methods used for this research will be described followed by a case study from shale oil business highlighting one of the big players in Estonian oil shale industry. Finally, the results and their implications are discussed and summed up in the conclusions.

Theoretical Background

The impact of sustainable transportation and green supply chain management are intensively discussed among scholars so that before the introduction of SECA regulations in BSR in 2015 the tentative changes for maritime stakeholders in BSR have been an important issue (Rao, P. & Holt, D., 2005; Hunke, K. & Prause, G. 2014; McKinnon et al. 2015). Notteboom, T. (2010), estimated economic disadvantages from SECA areas to maritime stakeholders who have to comply with strict environmental regulations which competitors in other parts of the world are not subjected to. The Institute of Shipping Economics and Logistics from Bremen (ISL, 2010) forecasted a disproportionally increase of

maritime transport costs in SECA regions initiating a cargo shift from sea to land transport so that shipping companies and ports would lose handling volumes and income. Other discussions (i.e. Wiśnicki, et al., 2014;OECD/ITF, 2016) argued that the regulations would weaken the competitiveness of European maritime transport especially in the modal shift of cargo flows from marine transport to inland transport routes of which, the implementation costs to the maritime sector would be between €2.6 billion and €11 billion by 2020 (AirClim, 2011). However, after 2015, no such significant changes have been seen and the vessels that operate in the Baltic Sea now use fuel that is low in sulphur content (Bergqvist et al., 2015; Olaniyi et al., 2017).

There are also ongoing debates on the impact of governmental policies and regulations on national growth. Using the endogenous growth theory, Barro, R. J. (1991) pointed out that regulations generally introduce distortions, such as high tax rates, spending and heavy investments that do not provide compensating incentives but give room for price and markets alterations that are investments deflators and negatively related to markets growth. Since productivity growth plays an important role in any economy, any distortions that adversely affect entrepreneurial activities have great significances for the growth of any economy (Solow, R.M., 1994). In the same light, Jaffe et al., (1995) argued that regulatory decisions are too time-consuming and are often characterised by litigation and other legal power struggles that lasts for decades of reforms with additional policies to the existing ones leading to what they called “transition costs”. Regulatory interventions impact investment choices which ultimately have a great effect on the economy because the build-up of regulations over time often lead to duplicative, conflicting, and even contradictory rules, and the multiplicity of regulatory constraints complicates and distorts the decision-making processes of companies or stakeholders operating in such economy (Martin R. & Sunley, P.,1998). Affected companies usually respond to individual regulations and the accumulation by changing their strategies for innovation process and these activities are embedded in research and development (R&D), expansion, equipment upgrade and processes (Bourlès et al., 2013).

Rebelo, S., (1991) claimed that regulations can be considered as the major cause for a decrease in productivity. The new Institutional Economics theory postulates that the economic development of a country is governed by its institutions (also called “active rules” like laws, customs, regulations) (Coase, R., 1998), and involve transaction costs or enforcement of contract which are expensive, reduce productivity and impose large direct and indirect costs on the stakeholders or more so at the society (Bourlès et al., 2013). This makes it imperative to balance the costs-benefits of any regulations by identifying and implementing pragmatic cost-effective regulatory instruments, whether conventional or market-based interventions because, the constant and avoidable expenses and investment could lead to societal waste (Blind, K., 2012).

However, Olaniyi, E.O. & Prause, G, (2016) explained that the innovation that stems from these activities is a key driving factor for economic grow and social wealth since innovative products and services emerge more often as a result of a cross-sectorial combination of technologies, design and business models. Solow, R.M. (1994) refuted this clarified that irrespective of the distortion any regulation might bring, every economy depends on investments in knowledge creation like research and development and in the manner in which they lead to innovation to create productivity. Furthermore, economic competitiveness depends on strong links between research, innovations and actors in an industry (Olaniyi, E.O. & Reidolf, M., 2015). This means that, theoretically, companies that are imposed by regulations are forced to invest more resources in the production process. While "production" of new technology, may require high financial input, they sometimes yield high returns. The impact of government intervention on economic growth does not only involve the direct and indirect costs associated with each regulation. They can at the same time create a stability which is connected to wider macroeconomic benefits such as GDP increases, competitiveness and productivity effect and other intangible benefits like protection of fundamental rights, social cohesion, international and national stability the economy status of any nation.

Until now there has been limited information available on the economic impacts of the SECA regulations on some maritime stakeholders and especially on maritime fuel sector. Maritime fuel producers in recent times have been plagued with downward price fluctuations alongside the usual sector challenge of speculations and economic forecasts, conflicts in different parts of the world, production estimates from the oil producing countries, stock levels, seasonality, weather and accidents (Nugraha, F., 2009). Estonian oil shale industry as part of the maritime fuel producers have to cope with the requirements of the sulphur regulations as well. The positive side of oil shale industry is that recently the industrial sector gained increasing interest since after a long time of decline re-industrialisation and enjoys a renaissance on the Western economic agenda because politicians, business leaders and scientists are recalling the role of the industrial sector as a key driver of research, productivity, and job creation. This particular industry generates about 80% of the EU's private innovations and 75% of its exports (Prause, G., 2015, 2016).

Estonian oil shale industry represents one of the most important national industries, which gives Ida-Viru the County the highest industrial share in the regional GDP and an analysis of the statistical figures underpin the connection with innovation and exports. For the innovation sector in Estonia, Kallemets, K. & Tänav, T. (2017) pointed out that between 2012 and 2013, the Estonian oil shale sector was responsible for more than 15-20% of total Estonian R&D expenditure. Furthermore, the authors, using on figures from Estonian Patent Office calculated that Estonian oil shale research yielded approximately 9% of all patents and 6% of all useful models granted by the patent office within this time. Kallemets K. & Tänav, T., also highlighted the link between €25.9 million expenditure on R&D of Estonian oil shale companies between 2009 and 2015 to be related to €434.6 million worth of innovation led investments into the physical capital in the whole value chain of oil shale mining and processing. Thus, during that period, a multiplier factor of 13.2 between R&D and investments was observed. Finally, the authors stressed the high potential for the Estonian oil shale business for further value-added gains through R&D due to the opportunities the low sulphur maritime fuel production or in the blends with other crude oils in regular refineries spurred by the SECA regulations. In this case, R&D and innovation can help the upgrading of shale oil to higher value oil products with an increased value of the product by 30-40% necessitating investments of several million euros into upgrading units.

Interestingly, these aspects are not represented in the Estonian smart specialisation strategy. The smart specialisation approach is a decentralised coordination approach of public interventions for the support to innovation and structural change in Europe (Foray, D. & Goenega, X., 2013). By investigating the regional development aspects, the smart specialisation strategy of Estonia has to be considered since the European Union stressed the principles of embeddedness and connectedness as criterions for fund allocation (McCann P. & Ortega-Argiles, R., 201; Prause, 2014; Olaniyi E.O, & Prause, G., 2016). Regional innovation strategies for smart specialisation build on a region's capabilities, competencies, competitive advantages and the potential for excellence in a global perspective. One of the key concepts of the smart specialisation approach is the self-discovery or entrepreneurial discovery process so that smart specialisation is flanked by supporting entrepreneurial self-discovery as well as by fostering innovation activities in the different regions (McCann P. & Ortega-Argiles, R., 2013) To this end, the bottom-up development is paramount to the major objectives of regional policies which are to tackle unemployment, increase economic growth and to decrease inequalities in a country and among countries (Olaniyi, E.O. & Reidolf, M., 2015)

The Estonian smart specialisation strategy concentrates on three thematic fields using the ICT as an enabling instrument implemented horizontally in all sectors, health, and more efficient value-added use of resources (EAF, 2013). Three ICT sub-sectors, where the potential is highest, are the use of ICT in industry (robotics), cyber security and software development. Health as a research field has been developed in the Estonian academic research environment over the last decade. The country offers several high ranking research centres in this field and has a relatively significant participation in international projects. Health as one of the key innovation fields is supported with various activities on the national and

international levels. In this growth area, special attention is given to biotechnology (personal medicine) and e-medicine. The term resource efficiency, as used in the smart specialisation strategy, is used in a very broad way as it includes material science, housing, food and the chemical industry. In all those areas, the public research environment is an active partner in national and international research projects. Under the theme of the efficient use of resources, special attention is given to using resources efficiently and creating additional value-added.

Methodology

This paper explores the activities of the maritime fuel company Viru Keemia Grupp AS (VKG) located in Kohtla-Järve in Eastern Estonia with the aim of studying how its business activities were affected by the Sulphur emission regulations. VKG was used as a single study unit since a case study is a type of research that investigates an individual, community or group to answer a specific question by seeking evidence that lies in the case setting (Gillham, B., 2000).

Between September and November 2016, data were collected from the company's records and the yearly financial statement of the company. Face to face structured interviews was made in October 2016 with the company's Director of sales and the Product Development Manager. Each interview lasted for 2 hours and 3 hours respectively. Additionally, a day of detached observations of the company's activities was made together with a tour of the production site for a first-hand experience. During this time, the authors had several interactions with VKG employees from the administration and production department.

Knowing that knowledge and understanding of how the environment impacts any business decision is key to the growth of any company (Fleisher, C.S. & Bensoussan, B.E., 2003), VKG's SWOT analysis was carried out through a brainstorming session as a diagnostic technique. The interview data together with the information from the brainstorming session was then used to evaluate VKG's strategic position and to analyse its business profile vis-à-vis a highly volatile and competitive market to draw out different suitable strategic investment options for VKG since successful value propositions are said to be embedded in great business models (Osterwalder, A. & Pigneur, Y., 2009).

Case Study

The subject case, Viru Keemia Grupp AS (VKG), is one of the largest Estonian companies and a producer of shale oil which has a sulphur content that exceeds both the SECA and the global sulphur emissions limit. Up until 2015, VKG was able to produce shale oil as bunker fuel without restraints. Due to the recent MARPOL regulations, the company is presently faced with the challenge of producing the stricter sulphur reduction of 0.5% from the 0.8% sulphur content fuel. In order to meet the demand of the new regulations and to persist in a highly competitive market, going forward, VKG must make tough and strategic business decisions which are linked to high investments and serious financial risks in the maritime fuel market.

In 2015, VKG's contribution to the state budget of Estonia was up to €35 million and Company's total turnover was €167 million of which €87 million was related to business activities from shale oil alone. VKG initially started as a shale oil producer but have in over the years expanded and diversified its value chain to about 10 enterprises: oil, heat and power generation, heat distribution, electricity distribution, power system construction, oil shale mining, cinder blocks production, metal structures, pipelines and pressure equipment production, logistics, assemble and repair companies. As at 2015, VKG has employed over 2100 employees with a monthly average salary of 1 390 € which much higher than the average monthly salary in Ida-Viru County of 863€ (SYBE, 2015: Estonia: 1065€; VKG, 2015).

The oil shale (raw material) in its solid state is extracted from underground mine of VKG Ojamaa mining site. Over 3.4 million tonnes of commercial oil shale of both fine and coarse grade is produced annually from Ojamaa mining

activities. The produced shale oil is useful as a quality-improving supplement for HFO or diesel supplement in industrial boilers and furnaces. After mining, oil shale is transported to Kohtla-Järve for processing in approximately 52 minutes with a 12.5 km conveyor (a piece of mechanical handling equipment that transports heavy and bulky materials from one end of location to another at production sites). VKG uses a thermal treatment technology where about 50-57% of oil shale energy is converted into liquid product (shale oil) energy while about 15-17% of oil shale energy is converted to gaseous by-product (waste gas) energy. A specific heat recovery process adds another 7-8% to the energy yield and the production of the solid by-products (mainly coke products) adds about 4 % energy yield. The gaseous by-product is used as fuel in the combined heat and power (CHP) plant. In order to increase its energy production efficiency, a €20 million investment was made in an 18km Kohtla-Järve – Ahtme district heat pipeline to supply district heat (DH) to the districts of Ahtme and Jõhvi.

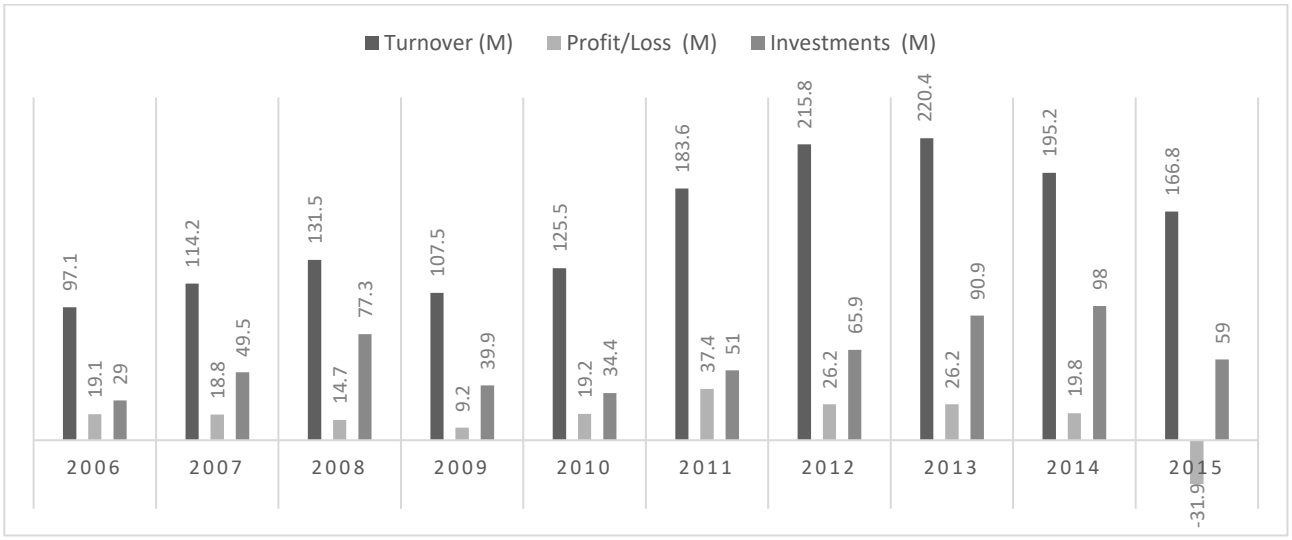
The majority of VKG shale oil customers are some of the largest oil traders in the world. VKG Transport, a VKG subsidiary is responsible for its logistics and uses freight on board (FOB) - Sillamäe delivery for most of its distribution activities. The distribution process starts from the production site through the rail which transports the shale oil directly to the Sillamäe port where tankers can pick for delivery to Rotterdam. Currently, there are marginal sales of VKG products to refineries, however, the majority of the liquid product mass is not sold to refineries but blended directly into product bunker fuel instead. Although VKG sells its fuel directly to oil traders and not to the end-users, considering the sulphur content of 0.8% as average in shale oil products, there might be a negligible possibility that the product is being used in SECA bunker fuel blend. Apart from its high sulphur content fuel by the IMO SECA sulphur regulation standard, shale oil has a viscosity-density relationship preferable for specific purposes: especially for improving HFO flow properties and pour point. This is one of the key selling points of shale oil but, it does not separate VKG from the realities of the evolution in bunkering fuel and the regulations that surround it.

The oil shale industry is a subject of several controversial discussions in Estonia due to the high ecological impacts comprising of high emission of CO_2, mining and ground water issues (Gavrilova, et al., 2010, 2005). Consequently, VKG as an oil production company is subjected to diverse environmental laws and regulations have to operate a centralised environmental department (ED) that provides services to all subsidiaries in VKG group. Because of its industrious promotion of environmental awareness activities, VKG has been consistently awarded the title “The Responsible Estonian Business” from 2010 to 2015.VKG intensive investments in the environmental causes had enabled a significant reduction in ecological footprint. About a €100 Million out of the €900 million investments VKG had made over the years were spent on environmental related activities.

As a response to the SECA regulation, VKG came ahead with a refinery project that was in the pipeline before the SECA regulations. The feasibility study on own refinery building and bunker fuel market change research cost VKG about €5.5 million. Business wise, running a refinery would have meant a product innovation that will yield Euro V Diesel (a majority of the production), 0. 1 Sulphur marine fuel oil and stabilised naphtha outputs. However, the outcome of the research could not dispel the uncertainties that surrounded the 2015 sulphur regulations and the market reaction to the sulphur regulations. The feasibility studies also showed that the refinery for the raw material processing capacity of 133% VKG shale oil production will cost a staggering sum of €400 Million coupled with the 5% depreciation of €20 Million annually making the management of the company to putting the refinery project on a hold. The risk is further magnified with VKG’s constant struggle with uncompetitive and high fixed costs of its fuel production when compared to crude oil and the downward fluctuation of the fuel price.

A look at the financial statement of VKG between 2005 and 2015 shows the sizeable contribution of shale oil to the annual turnovers, although 2015 shows a decrease in shale oil contribution. Also for the first time in 10 years, VKG

recorded a loss in 2015. One logical and obvious explanation for this occurrence is that oil price has fallen drastically, a bitter pill any operating oil company have had to swallow. A further look also shows the company's investment in 2015 was a lower percentage of the annual turnover (19.5%) when compared to previous years.



Source: Authors' construction based on VKG AS 2015 Financial statements

Fig. 1. **VKG's financial statement (2005-2015)**

Due to the new global sulphur emission cap, VKG has found itself in a position where it must make the assessment on the impact of sulphur regulations on the marketability of its oil products post 2020 and going forward on the most feasible alternative for its conformity with the regulations. Thus, VKG is faced with two major challenge; first, the fuel price collapse and its highly volatile market and second, the sulphur emission regulations compliance investments. Realistically, there are five investment portfolios VKG could strategically choose from. These are upward vertical integration, products upgrade, hydrodesulphurisation, and product discount and process innovation.

1) *Upward vertical integration*: Blending VKG shale oil with the 0.1% MGO or other low-sulphur content fuel- an upward vertical integration in its supply chain process. In this case, VKG will sell directly to its suppliers and will solely be in charge of how these products are supplied. With this action, VKG may likely be able to increase its share in the market by minimising the bottlenecks created by intermediaries and reduce its transaction costs, leading to an increase in its profits.

2) *Products Upgrade:* Building a new refinery which could results in a change of marketable products portfolio for VKG such as V Diesel, 0.1% Sulphur marine fuel oil and stabilised naphtha. However, the costs involved would have been higher than the stated capital expenditure (CAPEX) of €400 million. For instance, there will be additional investments in operational cost (OPEX) that involves employing more staff, maintenance, insurance, administration. The cost of operation without depreciation is estimated to be between €30-50 Million/year, which is will also depend on the price of natural gas and on the amount of the raw material (oil shale), processed.

3) *Hydrodesulphurisation*: The treatment (partial hydrogenation) of product oil for sulphur removal (desulphurisation) is a chemical reaction between molecular hydrogen (H_2) and another compound or element in this case - sulphur, with the help of a catalyst (Kabe et al., 2000). Heavier distillates are usually broken down through this process. While this process will solve the sulphur content challenge, hydro-desulphurization of shale oil might cost VKG between €100 – 150 million capital investments.

4) *Product Discount:* VKG can continue marketing of its existing 0.8% w/w sulphur content product but with a discount to traders if the future spread between less 0.5%w/w Sulphur fuel oil and less 0.1%w/w Sulphur fuel oil.

5) *Process innovation:* Process innovation, an implementation of a significantly improved production method (Utterback, 1994) will increase and improve VKG efficiency (energy efficiency, a mass yield of products and labour productivity) as a key factor for sustainability post-2020 global sulphur cap.

Olaniyi E.O. & Viirmäe, M. (2016) empirically assessed the investment portfolio of VKG and found out that there are only two options with a positive investments return, namely the hydrodesulphurisation and the product upgrade, and both options are equipped with a relatively high risk related to the future oil price and the price spread between oil and other maritime fuels. By comparing both options, it turns out that hydrodesulphurisation has the highest return on investment when compared to product upgrade it enjoys a lower risk so that the hydrodesulphurisation investment looks like the most favourable option for VKG. Hydrodesulphurisation option is related to necessary investment costs of €100 – €150 million which are unfortunately is linked to a financing problem due to high risks and appearing losses in the financial statement from 2015. The hydrodesulphurisation option challenge is also linked to oil shale resource allocation that is smaller than VKG processing capacity so that VKG unable to meet up to 100% of its shale oil production capacity (Olaniyi, E.O. & Viirmäe, M., 2016). This problem could be solved by the cooperation of the regional shale oil companies which are competing currently.

Research Results and Discussions

Estonian oil shale industry represents an important role in the national economy but its role in regional development for Eastern Estonia also stands for social cohesion. At the moment, the low oil price puts an economic pressure on the shale oil sector and in addition to that, the SECA regulations pushes the sector into a strategic trap because starting from 2020 big parts of the products portfolio, namely the production of maritime bunker oil, will have to change which will cost a lot of restructuring money. Related loans are complicated to access because already the 2015 annual report showed a loss and the low sulphur fuel regulations bedevil the access to fresh capital for the company. Additional discussions concerning ecological and sustainability issues are making the situation even more complicated so that it seems that without a political support and guarantees the situation cannot be positively changed.

The fragile economic situation in Ida-Viru County which is linked with the problem of the integration of Russian Estonians puts additional pressure on the situation. Until now, and to a large extent, the loyalty of the Russian-Estonians in Ida-Viru County is related to their living conditions and prosperity and these prosperous living conditions depend strongly on the economic success of the regional oil shale industry. Since about 50% of all workplaces in Ida-Viru County depend on oil shale industry, a collapse of this business sector would generate massive social and political problems in Eastern Estonia. Already, the unemployment rate is double and higher than the Estonian average and might increase to 25 – 30% if a mitigation plan is not put into place soon. Unfortunately, other regional economic activities are too weakly developed to mitigate these consequences but as already mentioned the Estonian oil shale industry contributes about €300 million annually to the public budget which can be used by public authorities to facilitate structural changes.

Despite the fact that the overall energy intensity of the Estonian economy is two times higher than the European average and about 10 times higher than the intensity of the economy of Denmark, the Estonian oil shale sector significantly contributes to innovation and exports and unlocks significant investments in the region. A detailed analysis of the cost price structure of oil shale and electricity generated from oil shale showed that resource and environmental taxes comprise of only 5% and 6% of the total cost price respectively. This is explained by the fact that most of the resource and environmental taxes for the oil shale industry are lower, in some cases very remarkably lower than for the other industries in Estonia, not to mention neighbouring countries (Gavrilova et al., 2010).

These considerations show that there is a space for political manoeuvring in order to restructure the Estonian oil shale sector. The annual report of VKG (2015) reveals that despite the loss of the company about €35 million was paid to the Estonian government, which is significant enough to allow the government to support the company in the realisation of the hydrodesulphurisation project. The bottom up support and development is paramount to the major objectives of regional policies which are to tackle unemployment, increase economic growth and to decrease inequalities in any country (Olaniyi, E.O. & Reidolf, M., 2015). The non-execution of this decision could pose a threat for Ida-Viru County that could lead to significantly increased unemployment in the county and invariably affect the social cohesion in the Eastern Estonia due to high regional unemployment and low regional employment figures. The current political option would be to rely on an entrepreneurial discovery process in the frame of an updated smart specialisation strategy in Ida-Viru County. Even at that, this might not be successful because other business sectors are weakly developed at the moment and there is a significant low entrepreneurial activity in Eastern Estonia which is expressed by lower enterprises density (Ida-Viru: 43%, Estonia: 49%, SYBE, 2016).

Finally, the innovation impact of oil shale industry should not be left out in this discussion since innovation is priority in euro policy agendas, in technological advancement and regional policy. More so, the potential evolutionary pathways of any innovation system depend on the inherent structures and the exiting dynamics that include the adaptation of radical transformation for any region (Foray et al., 2011). According to Foray et al. structural evolution 'is an accumulative process that links the present and future strengths of a regional economy in a particular domain of activity and knowledge'. That is why smart specialisation encourages regions to develop their innovation around existing schemes and interconnected diversification that can bring about an improvement of local cohesion for new entrepreneurial activities for regional development (EU, 2014).

The high energy intensive economy of Estonia requires energy-related R&D activities and innovations towards energy efficiency. Currently, the Estonian public funding of energy-related applied to R&D has been significantly driven by European Union structure funds and the EU funds financed up to 54% of the total public science funding in 2014. There have been three major programs since 2010, namely, the Support of Energy Technology Research and Development managed by EAS and Archimedes (€7.1 million), Smart Specialization (€26 million) and Support of Strategic R&D €28 million (€23.7 million funded by EU) managed by Estonian Research Council. The former was dedicated to energy technology and 40% of this sum was used for the oil shale industry. The latter two included some elements of oil shale and energy-related research with a budget part of about 10-20% of the total program (Kallemets, K. & Tänav, T., 2017). This money is complemented by private R&D money from oil shale industry in order to improve energy efficiency and to reduce energy intensity. These financial sources for R&D and innovation should be maintained to improve the situation of Estonian economy related to energy because innovation is closely linked to economic growth and performance and the fact that the wide disparities among region can only be reduced through innovations (Utterback, J., 1994).

Conclusions

The Estonian oil shale industry represents an important national economic sector with high contributions to export, innovation and workplaces. Through falling oil prices and the enforcement of the SECA regulations in 2015, the Estonian oil shale sector has come heavily under pressure. The case study of Viru Keemia Grupp (VKG) shows losses in 2015 and a deeper analysis even reveals a strategic trap which is linked to SECA regulations. In the current situation, the company cannot by themselves handle this crisis, hence, the question about political supports appears.

For Eastern Estonia, especially for Ida-Viru County, oil shale industry plays an important role with a regional impact of about 50% on the workplaces and high contributions to regional income. Ida-Viru County is dominated by Russian-

Estonians who are only weakly integrated into the Estonian society and who suffer from the highest regional unemployment rate in Estonia so that the economic situation of oil shale industry directly impacts the social cohesion. Despite the ongoing discussions on the ecological impact of oil shale and the missing integration of the oil shale industry into Estonian smart specialisation strategy, the research shows that the active support of Estonian oil shale industry brings more advantages than disadvantages.

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KNOWLEDGE TRIANGLE : HIGHER EDUCATION AND RESEARCH IMPACT TO INNOVATIONS IN EU AND LATVIA

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Abstract. The Knowledge Triangle is a policy paradigm that stresses the need for an integrated approach to research, innovation and education policy. It was conceived in 2000 as a part of the Lisbon Strategy (EU) in response to a series of challenges the region faced in its transition towards a knowledge-based society. Comparing different policy instruments, their relative impact and also comparing their impact across national and institutional borders may provide new insights as to what instruments work in higher education (HE) reforms.

One of the options to analyse the success of the used policies in education is to use World Competitiveness Index (GCI) analysis. The purpose of this research is to find out if the market size is indeed the main factor that makes impact on the elements of knowledge triangle. It is very important to emphasize the kinds of instruments to carry out policy changes in the HE.

We propose to make statistical analysis of following GCI indicators: 1) overall country GCI , 2) higher education and training , 3) innovations 4) market size and 5) research indicators about 28 EU countries and Norway. Statistical analysis except the intercorrelation analysis includes cluster analysis.

Results of the research: it was found out that groups with similar countries allow to analyse similarities and thus to make policy changes in higher education according to the best examples. Research shows that innovation level is strongly connected to the overall country GCI.

Key words: *cluster analysis, knowledge triangle, market size*
JEL code: E61, F62, C01.

Introduction

The Knowledge Triangle (KT) is a policy paradigm that stresses the need for an integrated approach to research, innovation and education policy. It was conceived in 2000 as a part of the Lisbon Strategy (EU) in response to a series of challenges the region faced in its transition towards a knowledge-based society.

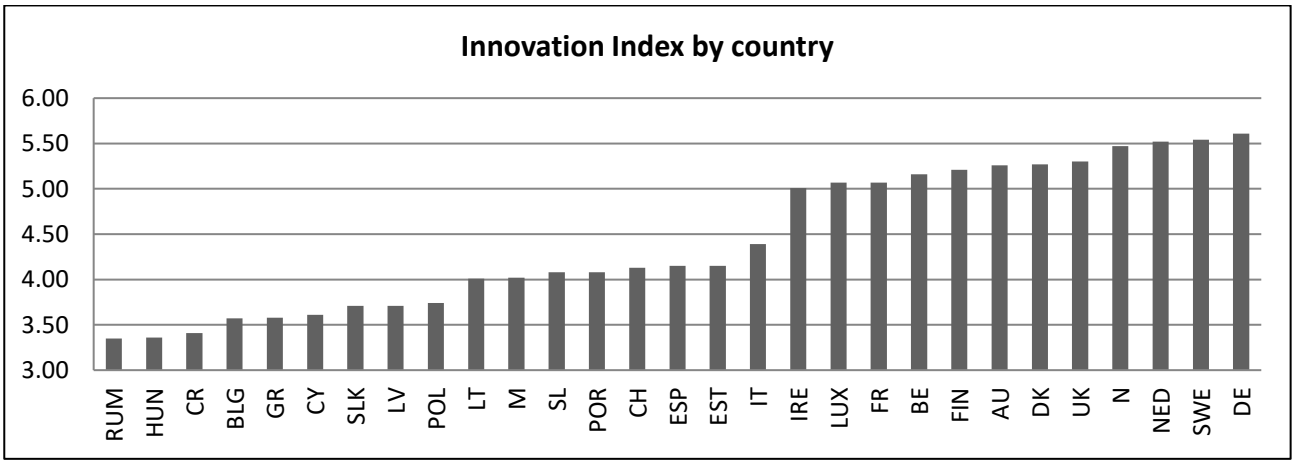
Policy-making for the development of "Europe of Knowledge" has relied on a number of different policy instruments. Comparing their relative impact and also comparing their impact across national and institutional borders may provide new insights as to what instruments work in higher education (HE) reforms. It is crucial especially for EU countries like Latvia, where the GDP per capita and the average income for inhabitants is comparatively low and the market size of country is relatively small.

There are very different indicators used to charactirize the elements of knowledge triangle. The EU 2020 Innovation Indicator is a composite indicator that consists of four components intended to measure different aspects of innovation outputs and outcomes: patent applications, economic significance of knowledge-intensive sectors, trade performance of knowledge-intensive goods and services, and employment in fast-growing firms in innovative sectors. These indicators have been proposed by a High Level Panel on the Measurement of Innovation (Janger, Schubert, Andries, Rammer, Hoskens, 2016). However, it is very difficult to compare these indicators with measures of other triangle elements. Another very popular information source, which gives important information about the current level of

development of the EU countries is the reports of the EUROPEAN COMMISSION „Research and Innovation performance in the EU".

The indicators analysed in the reports present a synthesis of research and innovation (R&I) performance , knowledge investment and input to performance and economic output throughout the innovation cycle, strengths in key technologies and also the high-tech and medium-tech contribution to the trade balance, the indicator on excellence in science and technology takes into consideration the quality of scientific production as well as technological development. The Innovation Output Indicator covers technological innovation, skills in knowledge-intensive activities, the competitiveness of knowledge-intensive goods and services, and the innovativeness of fast-growing enterprises, focusing on innovation output. The indicator on knowledge-intensity of the economy focuses on the economy's sectoral composition and specialisation and shows the evolution of the weight of knowledge-intensive sectors and products.But there aren't indicators about higher education

Latvia's poor innovation performance still impairs its competitiveness (Fig.1). The country has one of the lowest business R&D intensities in the EU (0.15 % in 2012). The national innovation system is overshadowed by low scientific performance, as measured by the share of scientific publications in the top 10 % most cited which at just 4 % is significantly below the EU average. There is little R&D investment by domestic companies or large foreign affiliates to support specialisation in knowledge-intensive and innovation-driven sectors. One of the reasons of these weaknesess is the market size of Latvia (3).



Source: author's construction based on Global Competitiveness Report 2016-2017

Fig.1**. Innovation Index by EU countries and Norway**

One of the options to analyze the success of the used policies in education is to use World Competitiveness Index (GCI) analysis. The main purpose of GCI is to assess the ability of countries to provide high levels of prosperity to their citizens, where one of the main prosperity indicating branches is the development of education system, because it includes twelve pillars of indicators and it covers all elements of knowledge triangle. These indicators are measured in the same scale from 1-7 , where 7 is the best. That was reasons why authors choose to use GCI . Latvia takes 39th place in pillar "higher education and training" and only 57th place in pillar "innovations" according 2016-2017 GCI .Usually specialists explain that it is the impact of country market size.

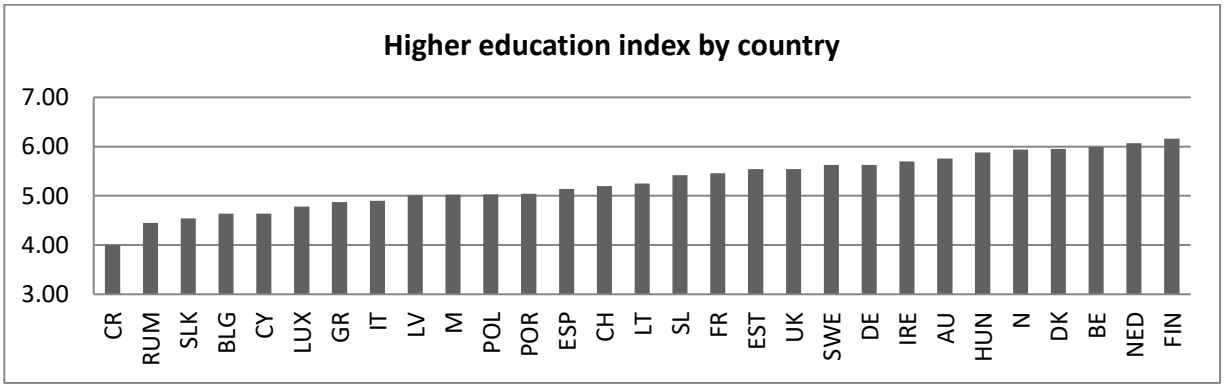
Source: author's construction based on Global Competitiveness Report 2016-2017

Fig.2. **Overall country Global Competitiveness Index by EU countries and Norway**

The purpose of this research is to find out if the market size is indeed the main factor that makes impact on the elements of knowledge triangle. The statistical analysis included following GCI indicators: 1) overall country GCI , 2) higher education and training , 3) innovations 4) market size and 5) research indicators. As the research is the part of Project '' EU policies impact to the transformations of the higher education and research system in Norway and Latvia» Project number: EEZ NFI 006'' we shall include indicators about 28 EU(also UK) countries and Norway.

Research results and discussion

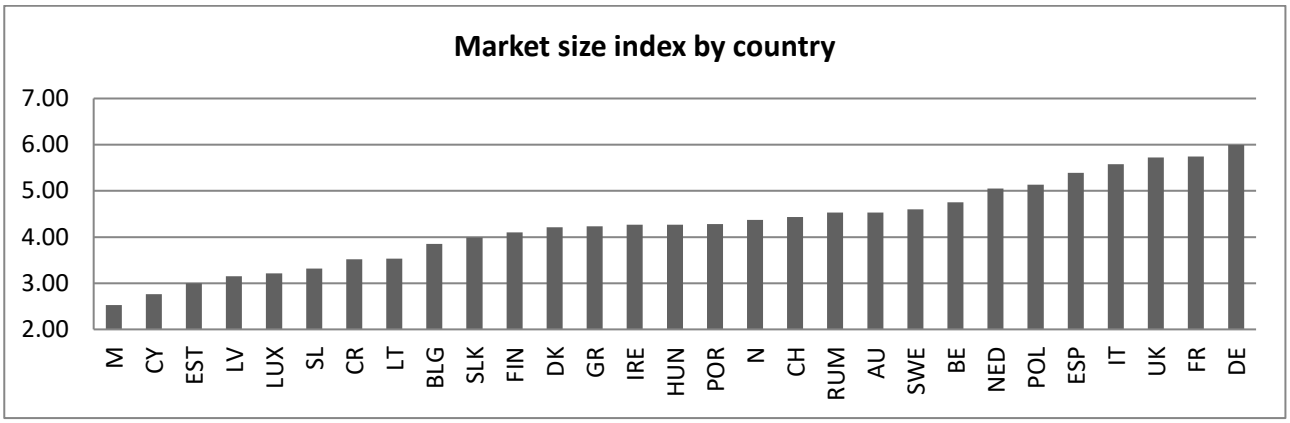
The values of indicators analyzed in this research are shown in the figures 1.-5. The first two figures (innovations and overall GCI) were already discussed. Analyzing higher education index by country, it is possible to notice that the top countries in this indicator are Finland, Netherlands, Belgium, Denmark and Norway, while the weakest countries are Croatia, Rumania, Slovakia, Bulgaria and Cyprus. Latvia is also at the weakest side of the rank. It is possible to notice that the strongest countries in higher education are from Scandinavia and Western Europe, while the weakest are from the East and West-East side of the Europe, which means that there are quite noticeable regional differences between countries. There may be several reasons for that, one, for example, could be the historical background.



Source: author's construction based on Global Competitiveness Report 2016-2017

Fig.3**. Higher eduucation Index by EU countries and Norway**

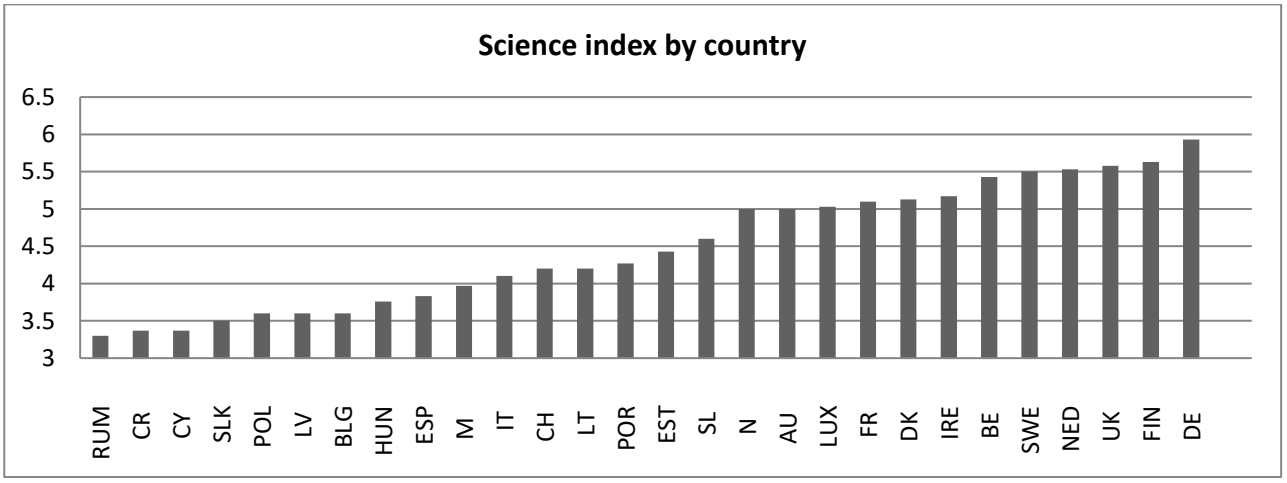
Although the market size (Fig.4) is an important indicator, there are no surprises to be discussed in this article Understandably, the countries with the most inhabitants are at the top of the rank (Germany, France, UK, Italy, Spain), while countries with the least inhabitants are at the end of the rank (Malta, Cyprus, Estonia, Latvia)



Source: author's construction based on Global Competitiveness Report 2016-2017

Fig.4**. Market size index by EU countries and Norway**

Analyzing the index of science (Fig.5), it is possible to notice a similar trend – that countries from the same region may have similar level of development in terms of this indicator. The countries with the best science index are Germany, Finland, UK, Netherlands and Sweden, while the weakest are Rumania, Croatia, Cyprus, Slovakia and Poland.



Source: author's construction based on Global Competitiveness Report 2016-2017

Fig.5**. Science Index by EU countries and Norway**

As we can see from these tables the leaders in higher education rank, Finland and Denmark are not the countries with the greatest market size or highest overall GCI ranking, while country with a large market size Italy is not very well situated in higher education rankings.Market size of Rumania is higher than market size of Norway or Finland, while the level of higher education and science is very different. This example shows that we need a more deeper analysis.

The first step to continue the research was a correlation analysis (Table 1).

Table 1

Correlation matrix between 5 GCI indicators

	OV	INN	HE	MS	R
OV	X	0.968	0.741	0.459	0.948
INN	0.968	X	0.729	0.451	0.955
HE	0.741	0.729	X	0.315	0.781
MS	0.459	0.451	0.315	X	0.408
R	0.948	0.955	0.781	0.408	X

Source: author's construction based on collected data

The results show that higher education has lower impact on innovation level of countries than overall level of country competitiveness and research level. The impact of market size on all other indicators is relatively small, but market size impact on heigher education is lower than on other indicators.

The next step is cluster analysis of the EU countries and Norway. In this research the authors used K-step method. The result of the cluster analysis was six clusters, where the sixth cluster consisted of Luxembourg only.

Table 2

Cluster analysis results

	Cluster members
1.	Germany , United Kingdom , France .
2.	Netherlands , Sweeden , Finland , Norway , Danmark , Belgium , Austria , Ireland.
3.	Czech Republic , Spain , Poland , Italy , Portugal , Hungary.
4.	Estonia , Lithuania , Malta , Latvia , Slovenia , Cyprus.
5.	Bulgaria , Rumania , Slovakia ,Croatia , Greece.
6.	Luxembourg

Further authors made analysis of the cluster centres (Table 3).

Table 3

Cluster centers

	GER ,FR ,UK	NED,SWE, FIN,NOR,DK, BEL,AUT,IR	CZ,ESP, POL,IT, POR, HUN	ES,LT,M, LV, SLO, CY	BUL, RUM,SVK, CR,GR	LUX
OV	5.42	5.37	4.52	4.46	4.23	5.20
INN	5.33	5.31	3.98	3.93	3.52	5.07
HE	5.54	5.9	5.2	5.15	4.50	4.78
MS	5.82	4.48	4.85	3.05	4.02	3.21
SL	5.54	5.30	3.96	4.03	3.40	5.03

If the results about first two clusters Germany, France, United Kingdom and Netherlands, Sweden, Finland, Norway, Denmark, Belgium, Austria, Ireland have to be compared,q it is possible to conclude that in countries with a relatively smaller market (Second cluster), but meanwhile with higher education rankings, it is possible to achieve identic innovation results as in the countries from the first cluster.

For Latvia (Fourth cluster) it is very interesting to compare the results with the countries from the fifth cluster. We can see that smaller market size is absolutely not a barrier to achieve better results in innovations and education. While the only difference with the countries from the third cluster is the market size.

Since Luxembourg has a quite special situation in Europe, authors excluded it from analysis. New classification shows very similar statistical results for five and six clusters.There were no changes in five cluster groups. However, six clusters classification shows than only the third cluster was dividend in to groups: Czech republic, Portugal and Hungary in one group, while Spain, Poland and Italy is in the other.

The cluster centers of these two groups are shown in the table 4.

Table 4

New cluster centers of the former third cluster

	3A-ESP , POL ,IT	3B-CZ ,POR, HUN
OV	4.58	4.47
INN	4.09	3.86
HE	5.02	5.37
MS	5.37	4.33
SL	3.84	4.08

The reason why new clusters appeared out of the third cluster is that countries of 3B group (Czech Republic, Portugal and Hungary) have smaller market size, but the higher education level is higher. Other indicators are very similar.

The results of the statistical analysis show that market size has not an essential impact on higher education and innovation level in the European countries, while a very important factor is overall level of competition.

As it was shown in a previous research (Apsīte, Purgailis, 2016) the weakness of Latvian higher education capacity is the legal capacity element. It means that specialists in Latvia must analyze how to make legal capacity more effiecient and study expierence of similar EU countries.

Conclusions

1.Correlation analysis shows that overall country GCI has the main impact on innovations, while the impact of market size is not important.

2.Higher education level doesn't make a very strong impact on innovations and science level.

3. Classification of EU countries and Norway allows to make analysis of breaking factors in similar groups to choose the instruments for higher education (HE) reforms.

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RELATIONSHIP MARKETING IN THE INTERNET DIMENSION: NEW CHALLENGES FOR THE BALTIC STATES MARKET

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Valerijs Praude, University of Latvia, Latvia

Abstract. Relationship marketing could be considered as a new approach for the customer relationship and loyalty level. The main idea of that approach is long-term relationship and influence on each other. All market participants develop their selves, products and communicational skills to satisfy customer needs and build strength relationship with them. Today it is impossible to avoid internet dimension in our everyday lives. Communication has a new place to develop a new level connections and satisfaction that as a result will improve customer loyalty level. Vendors are facing problem to integrate already known relationship marketing in the internet dimension considering internet environment specialities, evolution and development. As well as all other countries, the Baltic States also develop their market and adapt it to the internet dimension. It is important for to find out the main differences between traditional approaches to the relationship marketing and interactive approaches. The Baltic States has high level internet access and high customer awareness of internet possibilities. The main problem is to connect high technical level and low loyalty level of customers.

The aim of the paper is to find out the main approaches to the relationship marketing in the internet dimension. Research methods are the study and analysis of scientific literature on the topic, statistical data analysis and evaluation. The main result of the paper is relationship marketing approaches introduction in the internet dimension. Results can be used both theoretically and practically to improve communication with customers in the online dimension and build long-term relationship.

Key words: *Relationship marketing, Internet, Loyalty level, Baltic States*

JEL code: M31

Introduction

Nowadays it is impossible to live without connection to the new technologies, they provide us with the easy and quick entertainment and consumption. People spend online a lot of their time and that time increases. Smart companies moved a part of their business to the internet dimensions in order to make customers easier and faster access, to motivate them to do irrational purchases. It is convenient to reach a webpage you are searching for and in the Baltic States there is very high potential of customers in the online dimension. The main problem is that vendors in their online activities use all approaches they use in the offline market. They do not take into account specifics of that dimension that causes such kind of problems that customer switch their interest to another vendor, become more sensitive to price changes and long-term connection becomes short.

The aim of the paper is to find out the main approaches to the relationship marketing in the internet dimension used in the Baltic States.

Tasks of the paper are to compare relationship marketing understandings in the online and offline dimensions by analysing scientific literature and analysing statistical data.

Research methods are the study and analysis of scientific literature on the topic, statistical data analysis and evaluation.

Authors put forward hypothesis:

H1: Relationship marketing in the online dimension has several differences from the offline dimension in it's components.

H2: In the Baltic States customers are mostly satisfied with buying goods or services online.

Authors want to delimitate research subjects and consider three Baltic States countries – Latvia, Lithuania and Estonia. That research will be made taking into account data and specifics of current countries. Authors have found a lot of different researches about that topic in Asia and the USA, the novelty will be to put their experience to the Baltic States countries practise.

As it is possible to see in fig.1, in the 2016 there were 77.1% in Estonia, 68.2% in Latvia and 60.4% in Lithuania of individuals who are frequent internet users. That numbers shows that every day or almost every day such a big number of individuals uses internet.

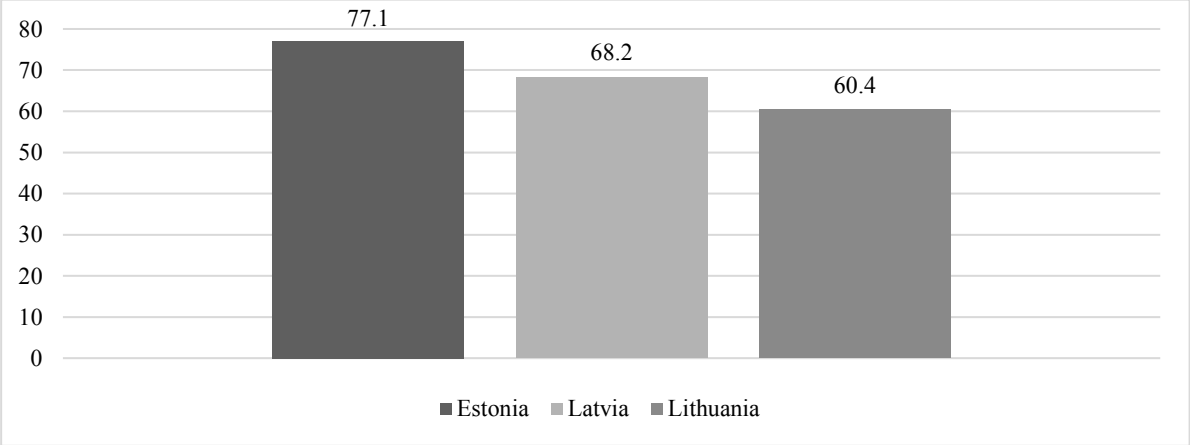

Fig. 1. **Individuals who are frequent internet users (every day or almost every day) (% of individuals, 2016)**

Source: author's construction based on European Commission statistical database

The next point that should be pointed out is necessity of communication and building strong relationships into the internet dimension because of a high number of individuals ordering services or goods online. As it could be found in the European Commission data base in 2016 there were 56.4% in Estonia, 44.4% in Latvia and 34.4% in Lithuania individuals ordering goods or services online.

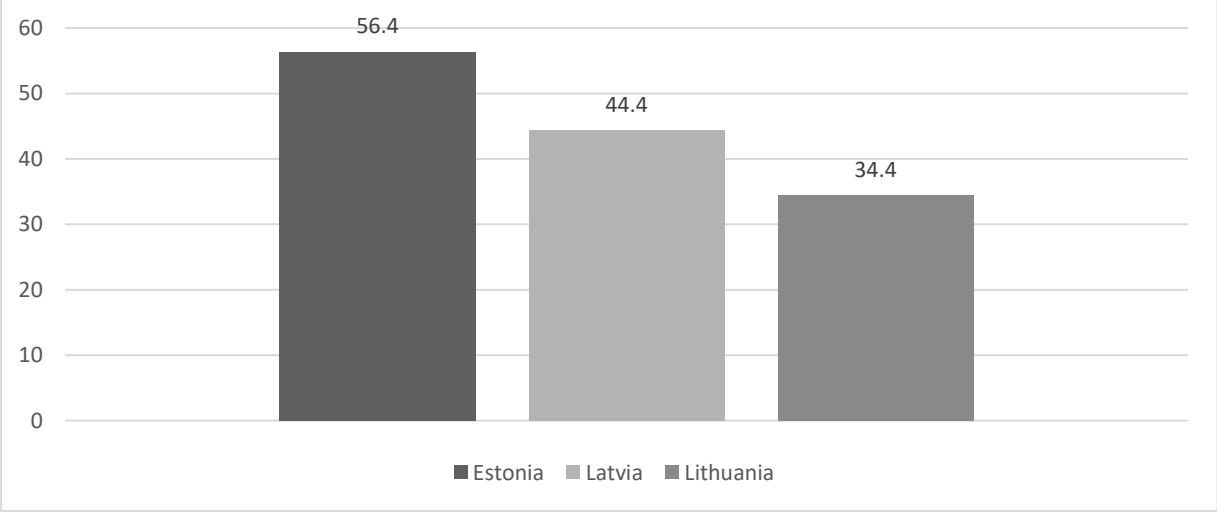

Fig. 2. **Individuals ordering goods or services online (% of individuals, 2016)**

Source: author's construction based on European Commission statistical database

When customers buy services or goods online that without any doubts have different problems. As it is shown in the fig.3 mostly customers are satisfied with the buying process. In 2015 in Latvia were 85.0%, in Lithuania 84.6% and in Estonia 69.2% individuals buying online who did not encounter problems when buying/ordering goods for private use.

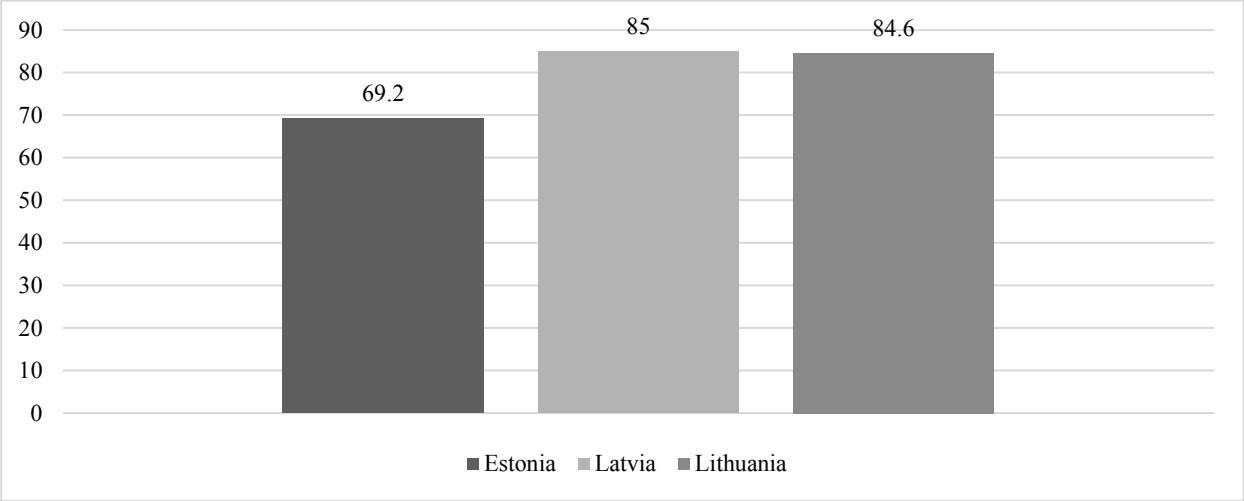

Fig. 3. **Individuals who did not encounter problems when buying/ordering goods or services over the internet for private use (% of individuals buying online, 2015)**

Source: author's construction based on European Commission statistical database

When customers buy services or goods online that without any doubts have different problems. As it is shown in the fig.3 mostly customers are satisfied with the buying process. In 2015 in Latvia were 85.0%, in Lithuania 84.6% and in Estonia 69.2% individuals buying online who did not encounter problems when buying/ordering goods for private use.

The main result of the paper is relationship marketing approaches introduction in the internet dimension. Results can be used both theoretically and practically to improve communication with customers in the online dimension and build long-term relationship.

Research results and discussion

1. Understanding of the relationship marketing

Relationship marketing first time was defined in 1983 as marketing activities that attracts, develops, maintains and improves the interaction with customers (Berry L.L., 1983), (Berry L.L., Parasuraman A., 1991), (Grönroos C., 1994) that changed the orientation of the main marketing focus - from short-term to long-term communication and interaction with the customer (Chiua H. C.,et. al, 2005).

Relationship marketing is defined as marketing that is targeted to the strong and long-term relationships with a core group of customers, making them feel good on the way the company operates and enabling them to themselves affect this activity (Khan, K.M., Khan, M.N., 2006). The explanation shows that the relationship takes place not by all customers but to a certain group of customers because no doubt there are always customers who do not want to let themselves in any way involved in the relationship with the company. The company, for its part ensure and offer high quality products at fair prices. Good practices purchase of a novel (non-execution) will become some customer routines. Consequently, it is in the interests of the company to build a long-term relationship with the customer because it is easier and requires less resources to sell up addition to a product than to push a new consumer to the first purchase.

Relationship marketing involves customers and integrates them to the company's activities (McKenna R., 1991) in order to gain the maximum interaction and the basis for a long-term relationship. In literature is the view that sometimes

it is necessary "to keep customers' hands away," (Parvatiyar A. et. al, 1992) meaning that the company always has clear understanding of what strategy and tactics is necessary to use in communicating with customers.

Relationship marketing's role and use with the consumer is not only fundamental but also closely connected to each marketing elements. Businesses could spend a lot of resources to buy or develop a customer database (CRM -Customer Relationship Management), which in the future will not only obtain and process consumer data, but also provide clarity as to target research and sell products to customers when they are in different stages of interaction with the company (Zhang J.Z., et. al. 2016).

By applying companys' activities to the relationship marketing, the company can not only increase the income but also the impact on a variety factors such as loyal customer number increase because loyal consumers no longer have to look for other products, another trader to switch their minds. As an additional advantage - in this case the consumer is becoming less sensitive to price changes, because no longer focused only on the price as the only value. Without a doubt, it is understood that there may be a loyalty without any kind of interaction, but relationship marketing, by its nature strengthens the loyalty level of relationship with long-term assistance. Because there is a stronger interaction with the consumer, the stronger will be the NPS (Net Promoter Score) index, which is considered much and where used as the main gauge of loyalty, which points to the fact that the consumer is ready to recommend the company to their friends and acquaintances. Consumers who return to the company, are willing to buy more and more with every purchase. Maintain links with them is much cheaper than the company attracts new customers, which still need to be convinced that it is the company's product is to be the best. Loyal customers will be happy to buy complementary and enhancing products. Satisfied customers are the best advertisement, their feedback can be used in companys' activities and campaigns (Buchanan R. W.T., Gillies C. S., 2002) The authors of current paper want to show relationship marketing increases customer loyalty level and company turnover, which makes happy both sides.

Companies are trying to create relationship marketing (including loyalty) program to increase the level of interaction with the consumer, which in turn increases the level of loyalty to the company and its products (Schiffman L.G., Kanuk L.L., 2004), thanks to the establishment of links between the company and its consumers (Roberts K., Varki S., Brodie R., 2003). In different sources of literature to be found in the advice that this interaction also includes the financial, social and structural side (Lin N.P., Weng J.C.M., Hsieh Y.C., 2003). In any case, creating interaction with consumers should not forget about such components as consumer behavior in the market (Gwinner K.P., Gremler D.D., Bitner M.J., 1998).

Relationship marketing components are trust, link, communication, joint values, empathy and mutual relationship. Every component impacts customer satisfactory positively that is proved in the paper Relationship Marketing Strategy and Customers' Satisfaction in the Third Millennium Organizations (Case Study: Banking Industry) (Azizi F., Bagherzadeh G., Mombeini H., 2014). Authors agrees that a trust is a part of relationship marketing key element that is important to build not only long term but also strong relationship between a company and customer. Link factor existence in relationship marketing develops customer's loyalty and it directly creates the feeling of belonging to the relationship an indirectly to the organization (Chattananon, 2009). Empathy is to understand demands and goals of the other party no difference if it's a company or a customer. Both parts have to be understood. The initial core of relationship marketing is communication process. While communicating sides can better fell and understand each other which will strengthen trust and loyalty. In mutual relations can be included formal and informal interactions which lead into a meaningful and on-time exchange between company and customer (Sin, 2005). Joint values are some added values that both sides gain from interaction with each other, can be both material and non-material values.

2. Relationship marketing in the internet dimension

The fact that we live in the 21st century and how the technology has become our daily integral part, is unquestionable. According to Central Statistical Office data, increasing every year and by 2016 77.0% of the total number of Latvian residents on a regular basis (at least once a week) use the Internet. Statistics 5 years is shown below and is as follows - 2010 in Latvia was 62.5% of the population who use the Internet regularly (at least once a year) in 2011 the number of users increased and became 66.2% , in 2012 - 70.3%, in 2013 - 71.2%, 2014 - 71.8%, 2015 - 74.9% and in 2016 - 77%.

Table 1

Individuals who are frequent internet users (every day or almost every day) (% of individuals, 2010-2016)

2010	2011	2012	2013	2014	2015	2016
62.5	66.2	70.3	71.2	71.8	74.9	77.0

Source: author's calculations based on Central Statistical Bureau of Latvia.

If companies want to move their activity to the Internet dimension you need to understand that this marketing channel is a modern with their own characteristics and differences from traditional marketing channels of understanding. The Internet consumer is uniquely placed to move quickly between the offers and shops, and the best way to look for alternative options that would satisfy his desires and needs as possible. However, it is assumed that the consumer is required to assess the product only after the information provided by the website, that is the image, describes other consumer feedback, etc. It should be noted that the consumer when deciding on a purchase, is also important for the website overall look and how convenient it is to navigate the website searching for the product and its specifications (Chiu C.M., et. al., 2014), (Hong W.,et. al. 2004), (Kolesar M.B., Galbraith R.W., 2000). Essentially consumer sees only a picture with a description of it and draw conclusions and decide on buying. Perhaps the consumer will look for a review, ask relatives and friends for help, but the main impression on him leaves the first information that is available on the website. Of course, if at the end the consumer will get a product that will not be an adequate description of the image, and he will not only be frustrated but also will trust that a particular company is unfair and there will be no desire to buy something again.

This is important not only to sell goods, but also services on the Internet (Bilgihana A., Bujisic M., 2015), such as hotel reservations, airline tickets, banking services. And only in the event of interaction with the consumer, he is willing to purchase goods or services to a particular company. In this case, the interaction will also be with the device itself and home page (Griffith D.A., et. al., 2001). The better the website design and ease of navigation, the more satisfied will be the consumer buying process (Floh A., Madlberger M., 2013). The authors of the paper agree that the consumer has a need to feel comfortable and free on the website to interact on the Internet as easily as possible, and the consumer should not only desire to return and make repeat purchases, but also recommend this website to their relatives and friends.

Relationship marketing components were trust, link, communication, joint values, empathy, mutual relationship. Taking into account internet dimension two more added components are a reaction time and protection in different ways starting from customer data protection to product return possibilities. Talking about reaction time can be mentioned that using internet it is easy to change one vendor to another if the first vendor reaction time will be slow and he will not provide needed information to the customer in a short period of time.

In the online trade market reaction time and protection is added components that differs from offline market talking about relationship marketing. In that case companies should show their customers that they not only are trustable and have classical relationship marketing components but also adapt it to the internet dimension where reaction time and all kind of data protection is very important points.

Conclusions, proposals, recommendations

1. H1 – proved theoretically. Relationship marketing consists of trust, link, communication, joint values, empathy and mutual relationship in the offline dimension. In the online dimension, there are some new factors such as reaction time and protection. H2 - proved. In the Baltic Sea State countries customers, mostly do not encounter any problems during online buying process. As it is stated in the Eurostat database in Latvia were 85.0%, in Lithuania 84.6% and in Estonia 69.2% individuals buying online who did not encounter problems when buying/ordering goods for private use.
2. With the growth of internet usage and transferring knowledge to that dimension it is necessary to adopt and change/add already known understandings like satisfaction, trust, loyalty. Components of relationship marketing such as trust, link, communication, joint values, empathy and mutual relationship positively affects satisfactions which increases loyalty level and makes stronger relationship marketing.
3. In the online trade market reaction time and protection is added components that differs from offline market talking about relationship marketing. It is easier to change one vendor to another in lack of appropriate information, answers to interested questions about product or delivery. By protections can be understood several things such as data protection, purchase protection, delivery policy and return possibilities. It is recommended to provide customers with the information about their protection not only returning policy but also with their data protection and credit card sensitive data protection. The main idea to make them feel safe during the whole purchase process.
4. In the Baltic States with their high level of internet connection and coverage quality it is necessary not only to take-over other countries experience but also to adopt it to our previous knowledge, culture, traditions and economic, political situation. As it was stated in statistical data customers in that region are mostly satisfied with online buying process and did not encounter any problems during the process.

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ENHANCING SUSTAINABLE AND FUTURE-ORIENTED CITY DEVELOPMENT WITH ASPECTS OF PROFILE ORIENTED MARKETING AND ADAPTION MANAGEMENT

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Abstract. The increasing urbanization is a key trend and the world is changing fast, therefore cities are facing complex transitions in economic, social and environmental areas. Therefore this paper addresses the need to understand city and location management, also termed communal marketing, as part of a process whereby its fundamental meaning and transformation are considered. As a result of this changing aspects, the design of city systems will play an essential role in shaping a sustainable, innovative and livable future and must be utilized more professionally in a focused and systematic way. Identity-oriented adaptive urban profiling was recently presented as a useful tool for municipals to enhance sustainable city development. It builds upon profile oriented marketing, while including elements of adaption management. Thus, city managers can increase their cities attractiveness by providing it with a clear profile that is recognized around the world on the one hand, while flexibly adapting to change if necessary. Here, this additional feature of the adaptive urban profiling model will be presented, that shall make the task of maintaining a stable profile while constantly adapting it, easier: the triple-bottom line. As the major domains of change are economic, social and environmental areas, these three domains are now integrated into the profile. Thus, if adaptations are necessary in one of the domains, the profile will still be recognizable via keeping the other two domains stable during this process. Thereby, the adaptive urban profiling model has now incorporated the three pillars of sustainable urban development. The city profile shall increase the uniqueness and visibility of competitive sustainable urban structures and provide solutions to optimize the urban living environment. Therefore, this work illustrates how the boundaries created to manage and market future liveable city destinations, in order to position cities strategically in a sustainable and future-oriented manner, and show the root of the practical and academic problems that trouble cities these days. This umbrella view serves as the foundation of a new paradigm in urban management and marketing. This paper targets practitioners who are responsible for city and location management and marketing, as well as figures in administration and politics.

Key words: *adaption management, brand-identity, city development, profile-oriented marketing, sustainability, urban marketing*

JEL code: O180, R110, R580

Introduction

Across the world, cities, regions and destinations are going through a period of transformation. The global economic crisis has wiped out years of social and economic progress and exposed structural weaknesses in its economy. Meanwhile, various long-term challenges such as ageing population, globalisation and pressure on natural resources are intensifying. To adapt to this changing reality, Cities and Regions can no longer rely on business as usual. (Barroso, 2012, p. 3) Currently, about 50% of the human population is living in cities (UN, 2017). In 2030 over 5 billion people will be city inhabitants and it is expected that this number will increase to two thirds (80%) of the world's population by 2050. Therefore, the future of mankind lies in the cities and this will change also urban life (Singles, Seniors, etc.). (vgl. Egger, 2016; UN, 2017) The Increasing urbanization is a key trend and the design of city systems will play an essential role in

shaping a sustainable, innovative and livable future in cities and must be utilized more professionally and strategically focused as a comprehensive process, herby should be determined what needs to be done to secure effective and lasting regeneration. (Roberts, 2016 p. 3ff) The importance of urban living space is constantly increasing, as cities are the housing-, work-, and life-centers of a majority of people. Cities are the carriers and pioneers of socio-economic change. According to Fraunhofer experts, sustainable cities are the key to a sustainable future (Fraunhofer, 2014, p. 6 Phase II). Therefore Economic prosperity, social and cultural wealth, as well as the sustainable development of a city are less amatter of chance, than the result of focused, organized and professional activities.

This development increases the demands in for city and destination management as their development planning (Welch Guerra, 2010, p. 5). In order to provide a secure social and economic environment for their residents to live and work in, cities and destinations definitely need clearly structured and consistent development plans to make sure that the short-, middle- and long-term requirements of the citizens are met as best as possible. Therefore, in current location competition, clear positioning and the associated demarcation between other cities and locations is an essential success factor in order to achieve an attractive living and economic environment. Therefore, a differentiation, through a positive image and a high degree of recognition become increasingly important. Mahrer mention in this context, that it is thereby out of question that cities need a strong value identity more than ever. (Mahrer, 2012, p.9) This above consideration show that there is urgent need for future and identity-oriented sustainable and comprehensive city / location development. Experts have long been in agreement on this. However, there has been a lack of sufficient scholarly discussion of the issues. Thereby, firstly in this work a qualitative and quantitative investigation on the change of urban management in relation to the transferability of trends in marketing to integrated city/location management in the 21st century.

The central task of cities is therefore to work out a clear positioning (a profile or also called unique selling proposition -> USP) and to market this unique feature accordingly. It is of the utmost importance to regard this process as an integrated and comprehensive approach. In this context, Dr. Mathis from the Institute for destination and regional development in Austria mention, that it is very important that public managers and city marketing manager understand cities and destinations as products and assume a business perspective in order to position cities strategically in a sustainable and future-oriented manner. A business point of view has to be obtained in order to be a successful player within the competition with other cities. (Mathis, 2017) Therefore, it is assumed here that cities are treated as products as in the business management theory. The city or location as a product is always the basis for the methodology. From this business perspective, it can be said, that Cities and destinations are facing similar challenges, as companies on a free market. Both cities/destinations and companies do now exist in an international environment requiring global thinking and increasing interconnectedness to other cities/destinations and companies. Between the conflicting priorities of globalization and regionalization, the existing areas of design and action in the cities and regions as their economic, social and cultural prosperity must be the result of targeted, organized and professional activities. In this context there is also a re-thinking about the terminus urban and city marketing (Heeley, 2016, p.12), which is currently generally regarded only as an accessory to the urban development and reduced as only outward communicative action. Also, the environment of cities, destinations and organizations is constantly changing at an increasingly faster rate. Originating in business administration, in the 1990s marketing became an increasingly important part of location and economic policy for cities and municipalities in Austria.

Therefore, marketing was originally defined for companies/organizations that produce a certain good or provide a service to be sold to customers. Thus, marketing refers to a product that is being marketed with the intention of selling it to a customer. The understanding of a product is however shifting and marketing is being applied in a variety of areas, e.g. also as city marketing. In contrast to the companies, a city or municipality does not have a product in the classical sense. The offer of a community is complex, immaterial and often of ideational benefits. In this context, products are

always endowed with certain characteristics, values and an image and offer the interested parties something specific and can identify with it. In this sense, cities and locations are to be managed like products. As in any successful enterprise, it is also necessary here to develop products consequently and to create, promote and offer innovative competition advantages. They need proper marketing in order to generate advantages in competition, to be tangible as products and to gain a clear visibility of their utilities. In this context, Engl mention that a product and a brand are interlinked and a product as well as a city or destination are interchangeable. In this sense, marketing is increasingly becoming an identity and perception marketing. So, as a first step, the status quo must be evaluated, then the basic product, the borough or city center, has to be developed, then a unique distinctive profile has to be created to determine the strengths, potential and weaknesses and a clear positioning of the city, which can offer in the future. As a next step, its current attractiveness factor should be registered and the awareness for the brand and profile of the city increased in order to facilitate capitalizing on it.

Before these issues are not clarified, is referencing each, but also the construction of an identity, a brand or an image are not effective. The first and most important step is therefore the exploration of the product city and in this context the increasingly dynamic environment demands rethinking brand identity in general. (Silveira, 2013) Specifically, this means that the development of the relevant product characteristics, location factors and the existing USP unique selling points – "the Profile" must be discussed. In a society and culture in which everything is becoming more and more the same, given characteristics are becoming more and more difficult, also in urban and location management. Therefore, a distinct location profiling is required. In this regard, many cities have learned that with the traditional methods and tools of marketing and location marketing, it is difficult to achieve a future-oriented, as well as sustainable, positioning or differentiation.

A city is a network of numerous stakeholders and their mutual networking requires good and professionel coordination, because their attitude and activities have a lasting effect on the city brand profile. Nowadays, the needs of the different target groups have changed and if their city does not move with them, the residents, the tourists and businesses move on. For cities, positioning is therefore an important process that creates the basis for attractiveness, quality of life and economic power. Only specific location positioning makes it possible to clearly communicate the unique features, in terms of the competitive advantages. The resulting strategic brand positioning concept is one of the most effective ways to achieve this attention. The location positioning in the form of a trademark makes it possible to clearly communicate the profile in terms of the competitive advantages. Communication is therefore a key strategic success factor in the context of the city location marketing mix (4Ps), for prevailing saturated markets. (Abegg, 2017, Stopfer, 2017) Therefore it is important to transfer the commercial marketing mix to city marketing, which is shown in table one.

Tab. 1.

Transferability of commercial Marketing - Marketing Mix for cities and locations

Product marketing (4Ps)	**How cities, locations and regions have adapted the idea**
PRODUCT Product policy: needs to be developed and analyse product characteristics	➢ location analysis and Identify competitive advantages -> Profile, USP ➢ define target group and determine positioning ➢ location management: reduce weaknesses, strengthening strengths and potential
PRICE Price policy: price needs to be determined	➢ land rates, taxes, fees and services, capital, wages,…
PLACE Sales policy: the way to the final consumer	➢ internal cooperation: offices, companies, associations, tourism agencies, cultural organizations ➢ external cooperation: City partnerships, companies, embassies
PROMOTION Communication policy: design of information, content and communication strategy	➢ Trademark policy: identity, logo, claim, image world – create pictures ➢ Inbound marketing: Web, Social Media, Content marketing ➢ Outbound marketing: TV/Radio/Print, posters, magazines, flyers ➢ Publication from rankings, positive surveys ➢ Events, Architecture, Flagship-projects
& PEOPLE	➢ Participation, legitimation ➢ Regional identity, regional awareness formation

Source: Abegg, Standortmanagement, ETH Zürich, 2017, p. 22

Recently, the identity-oriented adaptive urban profiling model was presented as a roadmap to such a structured and consistent development strategy/plan, an comprehensive process and as a tool of communal development. (Reschreiter, 2016). The identity-oriented adaptive urban profiling model was developed from an analysis of the similarities between city development management and marketing shown from a socio-economic business perspective. The methodology is a qualitative and quantitative investigation on the change of urban management in relation to the transferability of trends in marketing to (integrated) location management in the 21st century.

The aim is to examine the success factors of the applicability of theoretical knowledge, the use of new trends in brand management (profile-oriented marketing in conjunction with adaptation management) in city marketing practice.

Firstly, in this project, a comprehensive scientific analysis of the subject area of integrated city & location management for future-oriented positioning data is presented through brand development. It is mainly aimed at those responsible for city and location marketing, as well as figures in administration and politics. The defined identity-oriented adaptive profiling model is a procedure methodology for the development and qualification of cities with the aim of understanding sustainable, professional location development as an element of the city planning and anchoring it as a continuous process. Therefore the methodology of this paper is based on the tools of city location management and marketing principles. This model is recently presented as a useful tool for municipals to enhance the attractivity of the city for inhabitants, tourists and companies. This shall help them prioritize and tackle next innovative and future steps to establish and foster a clearly structured future vision to increase the visibility and uniqueness of competitive future-oriented, sustainable urban structures and provide solutions to optimize the urban living environment, to gain a success factor in the location competition.

Globalisation and Sustainability - the challenges for city development

The major challenge for both city development as well as for marketing, is Globalization. Globalization intensifies competition and increases comparability. Clear profiles with unique identities are therefore gaining in importance. This challenge of globalization and the constant growth of cities creates an environment in which cities are challenged to compete with each other for citizens and organizations (Heinrichs, 1999, p. 9). Thus, cities and destinations are facing similar challenges, as companies on a free market. Both cities/destinations and companies do now exist in an international environment requiring global thinking and increasing interconnectedness to other cities/destinations and companies. Globalization results in increasing competition among both cities and companies. Current conditions are characterized by an extraordinary level of uncertainty and dynamics. The environment of cities, destinations and organizations is constantly changing at an increasingly faster rate. In order to survive, both cities and companies have to increase their adaptive capacity. In order to achieve and sustain competitive advantage, both cities and companies are forced to explore sophisticated management models (Porter, 2013).

Based on these similarities it was possible to apply current trends in marketing to city/destination development management. These trends include profile oriented marketing on the one hand and adaption management on the other hand. The current paper will take a closer look at the profile included in the adaptive urban profiling model.

Therefore in the first step the concept of " Sustainability" which considered as a solution for the ecological crisis, has taken into account. As a reconciliation between economy and environment the term sustainability entered more and more into the everyday speech, which was taken over in the specialy economic language around the 70´s. Thus acquiring a major significance and became a priority of the business environment. Today sustainability or sustainable development which is based in the field of environment is a well rooted concept, and part of micro- and macroeconomic level, to minimize costs, looking into the future and taking into account of the economic, social and environmental effects of the actions performed. (Mehedintu, 2016, p. 20) The most accepted and commonly used term is given by the world commission on Environment and Development in 1987: " Sustainable development is development that meets the needs of the present without comprimissing the ability of future generations to meet their own needs". (Boiral, 2017) In times to come the concept has acquired three dimensions. According to the "triple bottom line" a sustainable development can only be achieved when the three aspects economic, social and ecologic equally taken into consideration. (Crane, 2004, p. 24-29)

These sustainability interrelations have to be implemented at the local level, i.e. they have to be integrated into city and destination development plans. Thus, city development planners are challenged to direct their cities development in accordance with the goals of sustainable development, i.e. while protecting the environment. The difficulty therby is to identify as soon as possible the wishes and needs of the parties the company or city interacts with, to adapt to new reality, to be innovative and open to progress. (Mehedintu, 2016, p. 20) On the other hand, city development planners are challenged by the goal that said development of their city should be sustainable in itself, i.e. their cities processes should be able to endure in the context of rapid international change. A major challenge at the social level is civic participation. Civic participation refers to the participation of citizens in political decisions and planning processes (Novak, 2006). Historically, civic participation aims at achieving more direct forms of democracy. Thus, city development has to balance the global goals of responding to demographic change and globalization and ensuring the sustainability of the environment and itself, while locally taking into account the needs and wishes of each individual citizen. In this context the current and future trends on European level set by the European Union targets and flagship initiatives in its "Europe strategy 2020" to enhance the competitive edge in the world at providing an intelligent economic growth by innovations, education, improving the environment by reducing the carbon dioxide emissions and at social inclusion. In order to develop the three

axes, they proposed five major objectives. 1) Attaining the employment rate of 75% for the active population between 20-64 years, 2) Allocating 3% of GDP and invest for research and development, 3) climate/energy change: increasing the weight of the renewable energy sources, increasing energy efficiency, reduction of the greenhouse gas emissions up to 20%, 4) Enhancing the educational level, 5) Fighting against social exclusion. (Barosso, 2013, p. 3) In each of these areas, each EU country has adopted its own national targets. These objectives are important for the indicators of the designed model in this paper. The indicators provide a holistic view of the future viability of a city and form the basis for the city profile.

The identity- oriented adaptive urban profiling model

The identity- oriented adaptive urban profiling model is designed as an action oriented, three-dimensional profiling model, and is understood as a holistic approach, as a comprehensive process for a sustainable urban development. This model is a procedural development methodology, which integrates the relevant decision makers of a city or economic region/destination into the process of re-orientation, and consecutively leads efficiently to sustainable results on the basis of the generated profile. These results offer the opportunity to recognize the city (or regional) and consequently allow to engineer successful strategies and implementation measures and represents the basis for defining the trajectories of transition for today´s cities. In this sense, cities and destinations are to be managed like products. This study targets to contribute to this endeavor in order to produce new impulses and incitements. In Short, the identity-oriented adaptive urban profiling model merges profile-oriented marketing with adaption management.

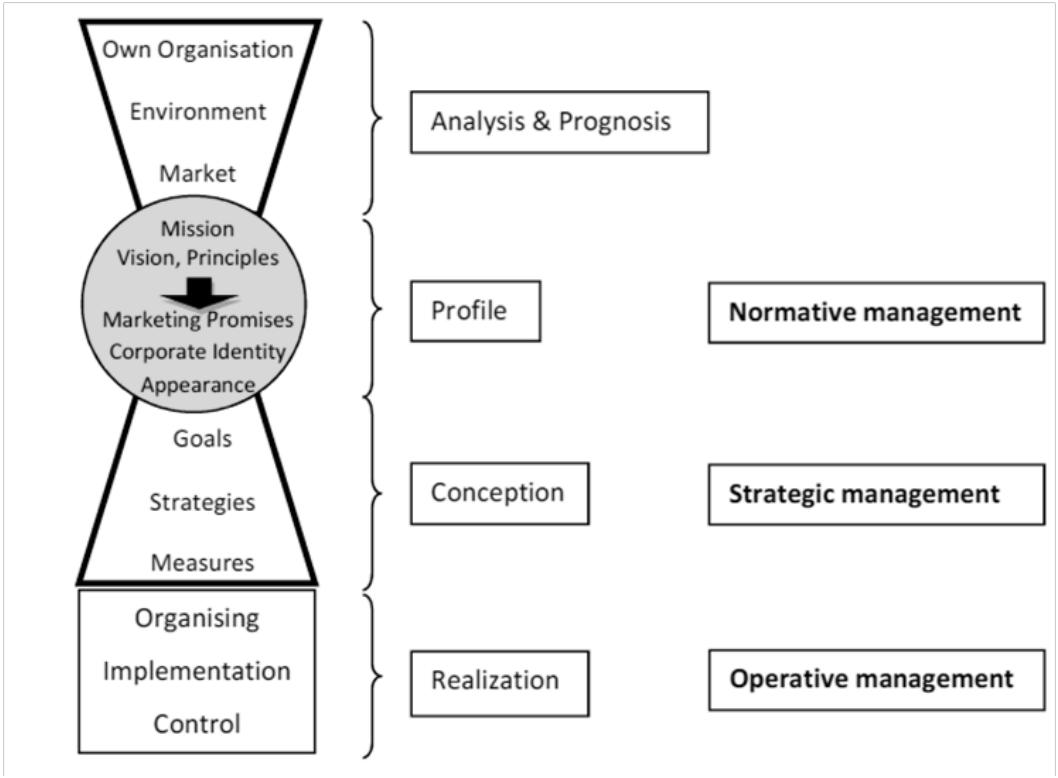
2.1 Profile-oriented marketing

Profile oriented marketing adds a new dimension to the concept of marketing: the philosophy. Profile Oriented Marketing is strategic marketing with a profile. The profile is the pivotal point in Kellner's profiling structure model. A profile is a bundle of individual, as unique as possible characteristics of a communality. These characteristics include (i) the quality statement (mission), the aspired state (vision), a clear and valid mind-set (principles), the appearance (corporate identity). Mission, vision and principles are summarized into the first level of the profile, i.e. the overall concept. The corporate identity and marketing promises are summarized into the second level, i.e. the appearance of a profile (compare Figure 1).

The profile is derived from a detailed analysis of the existing strength and weaknesses of a city or organization. The analysis is the first step of profile-oriented marketing. The identified strength and weaknesses are integrated into the overall concept, which points out the strength to be built upon and the weaknesses to be improved. The overall concept can also be viewed as a cities or organizations identity. It represents an abstract set of principles to guide the concrete actions of managers and municipals. What these concrete actions include is summarized in the mission element of the overall concept (compare also Kotler, 1988, p. 43) and complemented by the vision element. The vision element includes the view of the city that should be achieved in the intermediate future (e.g. Bleicher, 2004, p. 105; Kotler, 2003, p. 165). From the abstract principles, mission and vision, fixed rules and guidelines for behavior can be derived, which represent the principles, i.e. the third element of the overall concept. In order to achieve the goal formulated in the vision, the behavior of managers or municipals should not deviate from these principles while performing the task of the mission. A violation of these principles would mean a deviation from the profile, i.e. a change in identity.

The appearance level is guided by the overall concept level, i.e. the appearance of a city should reflect its mission, vision and guiding principles to be perceived by the outside world (e.g. Wahrig, 2001, p. 435). A cities appearance can be the more consistent, the more clearly the overall concept is formulated. Marketing promises provide a clear commitment to citizens, companies and tourists. For cities, these promises can be formulated in a city slogan, which helps

to establish civic identity, makes the community recognizable by outsiders and attracts people to the community by promoting pride and unity (Muench, 1993). Thereby city slogans also increase the economic value of cities (Muench, 1993). Marketing promises transport the mission, vision and guiding principles to the customer, which in the case of cities are i.e. citizens, companies and tourists. The rules of appearance are comprised by the corporate identity. An integral part of a cities corporate identity can be a flagship building.



Source: author's construction based on Kellner, 2007, p. 60

Fig. 1. **Profiling Structure Model**

Particularly profile oriented marketing is suitable to increase the attractiveness of a city, as it specifically aims to further development, i.e. also city development. The profile gives an organization a clear future perspective and direction of development. Thus the same should apply to sustainable urban development. Among the most important developments appear are the creation of niches and a decrease in competition. A well characterized, clearly defined profile emotionally distinguishes a city from competing cities and allows it to occupy its own, well defined emotional space/niche. However, for organizations, the people that have to foremost identify with the organization are not only costumers, but the employees have to make profile-oriented marketing successful. Thus, city marketing can only be successful if tourists, organizations and citizens alike identify with the city. Profile oriented marketing allows city marketing to be consistent at all levels.

This methodology considers companies or cities, market environment and the markets in which the company or cities/destinations moves, holistically. The marketing goals, strategies and measures are strictly aligned with the acquired profile. In summary, the profile is the result of constant analysis and prognosis of the city, its environment, the competitors and a prognosis of future developments. Once the profile is established clear goals can be defined and strategies and measures to achieve these goals can be developed. These strategies can then be realized by a strict organization and control mechanisms at each implementation step.

Meanwhile, profile oriented marketing is an effective way to quickly achieve clarity, enthusiasm and success in a company, city or destination and it makes two assumptions that do not necessarily apply to modern smart cities. First, at

the initial analysis of strength and weaknesses, not all information may be available, i.e. the analysis and prognosis may be based on uncertain information. Second, strategies may fail because information changes over time. In that case, it is important to be able to go back to the beginning or to an earlier stage of the problem and start again. This is however not possible in the profiling structure model. It is however possible in adaption management, which is seldom integrated into city development plans.

Therefore, elements of adaption management were integrated with Kellners profiling model to form the adaptive urban profiling model.

2.2. Adaption management

A group of ecologists introduced in the 1970s, adaptive management as a continuous systematic process for improving management practices by learning from the outcomes of previous decisions (Intaver Institute, 2014). Thus, adaption management basically implies „learning by doing' and adapting based on what's learned (Walters and Holling 1990). The best management strategy is determined by experimentation, which in the long term shall reduce uncertainties, which arise from natural variability, incomplete data or social and economic change (National Research Council, 2004). Projects are managed based on learning from actual project performance via the use of quantitative methods. Most importantly, adaptive management aims at a timely response to change, i.e. flexibility in decisions. As change is rapid not only in the field of ecology, the concept of adaption management was soon applied outside the field of ecology.

Adaptive capacity refers to the capacity of a system to adapt to environmental changes. Diversity, flexibility and creativity are catch phrases associated with adaptive capacity. In ecology, the survival of a system is correlated to the diversity of different species inhabiting it, since a high diversity allows for the occupation of different niches (Walters, 1986; Gunderson & Holling, 2001). Similarly, the adaptive capacity of cities is also influenced by social factors (Klein and Smith, 2003; Brooks and Adger 2005; Tompkins, 2005; Berkhout, 2006). Diversity allows for a higher flexibility, larger common knowledge, creativity of decisions and responsive power structures, which determine the adaptive capacity of social systems (Gunderson & Holling, 2001).

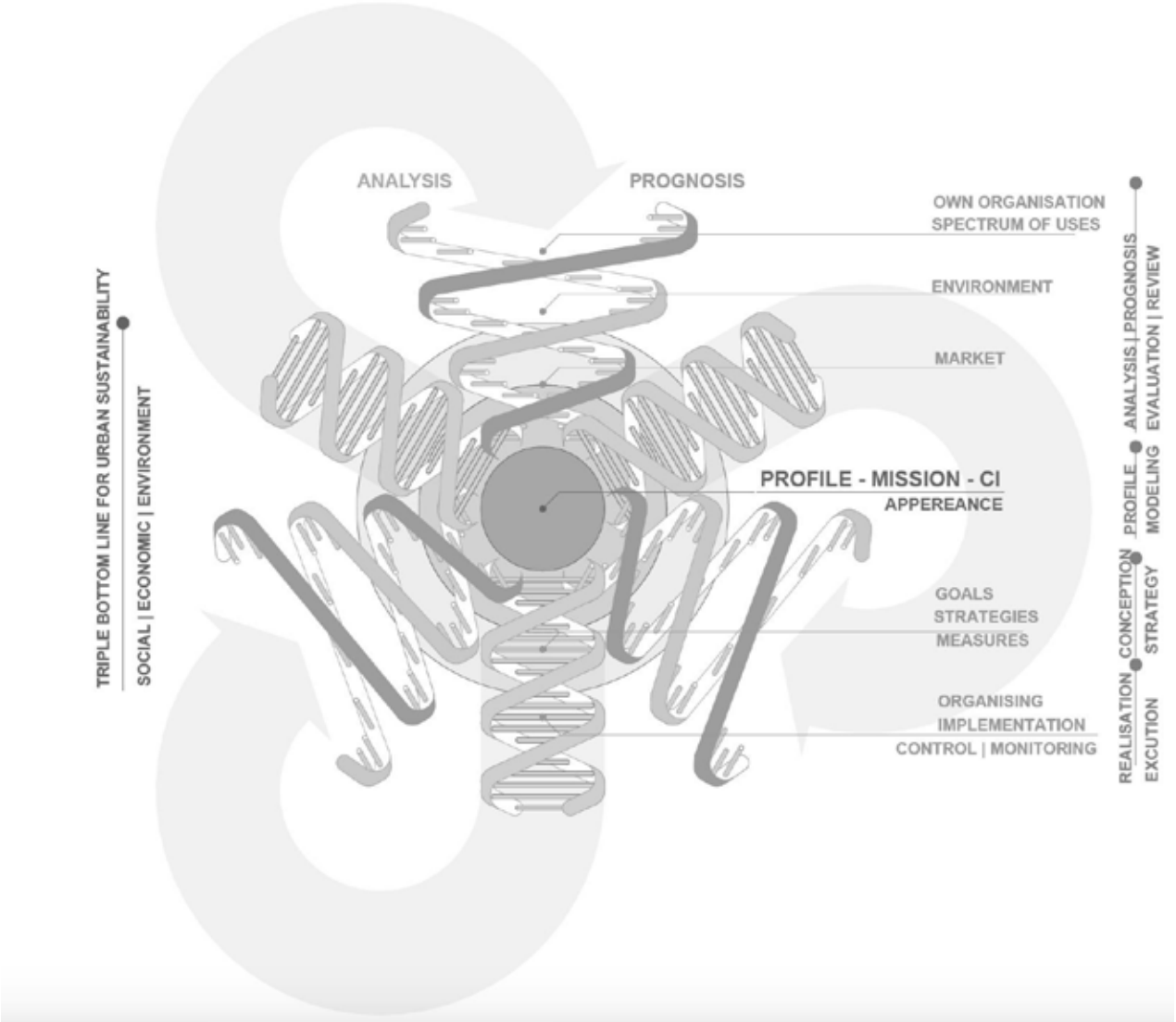
Thus, the adaptive urban profiling model includes elements of adaption management into the profiling structure model in order to develop a new urban profiling system to be utilized to create resilient cities by enhancing their adaptive capacity. Within adaption management, different approaches can be distinguished, i.e. passive and active adaption management (National Research Counsil, 2004; Salafsky et al. 1991). The main distinction between these approaches is that passive adaptive management focuses less on the reduction of uncertainty than active adaption management (Walters 1986; Williams 2011). Therefore, the elements integrated into the adaptive urban profiling model mirror active adaption management.

1.3. Linkage of profile-oriented marketing and adaption management to the adaptive urban profiling model

Since urban transformation processes gain more and more complexity, the two-dimensional Profiling Model from Kellner is therefore too constant and not flexible enough for an individual sustainable development process. A dynamic combination of solutions at the urban level can increase the overall sustainability of the city. The model has to be more flexible, complex and dynamic.

Therefor, the identity-oriented adaptive urban profiling model has been fitted in spiral form with a multi-layered system (Figure 2). As suggested by adaption management, it can therefore repeat the process represented in Kellner's hourglass an infinite number of times by continuously monitoring the success of the initially derived measures and re-evaluating the initial analysis. The transition from implementation of measures to starting a new analysis and prognosis process is fluent, but each repetition is centered around the profile as an anchoring point.

Although the profile provides the city with the stability to encounter radical environmental changes, adaption management processes increase the resilience and sustainability of the achieved city development plan.



Source: author's construction

Fig. 2. **Identity-oriented adaptive urban profiling model**

By incorporating elements of adaption management, the identity-oriented adaptive urban profiling model introduces a higher degree of flexibility into the cities profile than the original formulation by Kellner suggests. If the profile is too fixed, it will diminish the cities adaptive capacity, i.e. its ability to react to unexpected change in a flexible way. (Reschreiter, 2017) Profile-oriented marketing starts with an analysis of the problem before developing a profile and strategies to solve the problem and further the development of the organization or city. Here the goal of the analysis is to crystallize the profile by understanding the strength and weaknesses of a city. But it is also not enough to simply know the strengths and development potential of a city. In this regard, it is much more important to have a clear strategy which can be achieved with the strengths and potential and towards which the city can develop and to have overriding goals in particular to economic prosperity and social- as cultural wealth. This must involve also the relevant competition environment. In the original model Kellner proposes that the analysis step also has to include a "prognosis" of the performance of a city in the near future (Kellner, 2007, p. 62). He suggests questionnaires, expert interviews and extrapolation from previous experience as methods of prognosis. In the sense of adaption management however, the

prognosis step should rather be viewed as a hypothesis generation step, which includes more flexibility in the model. Rather than assuming that the situation of the city will develop in a certain way in the near future, it is predicted that if certain criteria apply, the city should develop in a certain way. If information changes, such that those criteria don't apply anymore, the city development planner can go back to the analysis step at any time and develop new adapted hypotheses.

Therefore, identity-oriented adaptive urban profiling has to bridge the complicated tasks of preserving the cities identity while maintaining a high degree of behavioral flexibility. Therefore, the first and essential step is to examine the city as product and this is always the basis for the methodology. Only when the product and the overriding regional economic and social goals have been determined is it possible to start tackling professionally the deeper area of location marketing. One way to do that is to integrate flexibility into the guiding principles. Another way is to keep the guiding principles as basic as possible. The overall concept is specifically requested to only include a selection of characteristics. Thus, it is the task of the analysis step to identify the strengths and potential of the city to be included into this concept and it is the task of the prognosis step to identify the weaknesses to be improved that are to be included in the vision statement. In accordance with the idea of adaption management, it should always be possible to go back if several attempts to improve a certain weakness fails and select another weakness to improve.

The current paper presents another option that makes the selection of characteristics to pursue easier for municipals and shall help them bridge the gap between stability and flexibility: the triple-bottom-line. This identity- oriented urban profiling, ie. The implementation process can also be interpreted as a marketing and location management concept and is therefore part of comprehensive, integrative urban development. The socio-economic focus is vital in particular for the development of professional future and identity- oriented and sustainable city management. Therefore, only specific location positioning makes it possible to clearly communicate the unique features "the profile", in terms of the competitive advantages. In location competition, therefore, the use of an instrument, an integrated approach, such as the identity-oriented urban profiling model, must be able to provide the city with the necessary individual positioning in the perception of the different target groups. Because the retaining and relocation of the cit´s resources, can only be achieved with distinctive profiling. This study intends, for the first time, to present a comprehensive inquiry and an independent profile with a holistic, sustainable, value-oriented approach to determine positioning, attractiveness and the brand strength of a city.

3. The triple bottom-line for the identity-oriented adaptive urban profiling model

It is a prospective challenge to bridge the gap between providing a clear perspective and keeping values constant and recognizable, as intended by the profile, on the one hand, and constantly updating and flexibly changing marketing strategies on the other hand. Cities are complex formations by nature and already include an option to manage this task in their structure. Therefore, we are nowadays, challenged to actively master urbanization worldwide by using the right solutions for a future-oriented and sustainable development. A sustainable development can only be achieved when the three aspects economic, social and ecologic equally taken into consideration. Sustainability goals therefore are necessary for the cities of the future, but have to be complemented by additional dimensions like values, Identity-orientation and the ability to innovate. In our developed and industrial communities with high proportions of service industries, it´s not about economic growth at any cost, but rather about social and economic development with sufficient development and guarantee of quality of life in the area.

Within the Analysis and Prognosis Step, Kellner distinguishes between the city itself, its environment and the market, although these areas are intertwined with each other. While the city itself includes all aspects of the city that city development planners can influence, all factors that city development planners cannot influence are subsummized under

environment. This is also the area for which prognosis has to deal with the most uncertainties. He defines the market as the temporal coincidence of demand and supply. In city marketing the special situation occurs that demanding and supplying party may be virtually the same, i.e. citizens of the city that create their own living environment with the goal for a better quality of life, or organizations that boost the economy of a location by investing in it. (Kellner, 2007, p. 62)

As starting point for such an analysis of the current situation the Fraunhofer Morgenstadt approach, appears as an especially usefull tool. The Fraunhofer Society research innovation network initiated the Morgenstadt: City Insights an City of the Future "M:CI" initiative which has been designed as a pioneering project between industry, cities and research that addresses the growing issue of sustainable cities at an early stage from a systematic and integrated perspective. Each city is individual and the approach has been developed to assess a city as an individual complex system. The identity-oriented adaptive urban profiling system proposed here shall take the same perspective, but adds the component to the identity. (Bullinger, 2014, p. 2)

It is recommended that similar measures as used in the current thesis for testing the adaptive urban profiling model (see dependent variables) are also utilized by city development managers for the analysis and prognosis step of their urban profiling. Thus, the "Morgenstadt model" from the Fraunhofer research society is here put at the start of the process as a suggestion for what an initial analysis of the city can look like.

Thjs approach assesses 45 urban indicators and 8 activity fields based on the ISO 37120, the Fraunhofer Morgenstadt indicators, the economic growth indices and the Mercer quality of living indicator categories and the smart city strategy. The indicators provide a holistic view of the future viability of a city and form the basis for the city profile. They distinguish between:

- State indicators: the current state of a range of sectors in a city
- Pressure indicators: pressures that impact on a city
- Impact indicators: the current impact that the city has on economy, society and environment

Roughly, it can be said that the state indicators analyse the city itself, the pressure indicators its environment and the impact indicators the market. Thereby, the profile automatically gets a triple-bottom line, i.e. it includes three domains (social, economic, ecological), which correspond to the three pillars of sustainable development identified at the 2005 World Summit on Social Development as well as according to the formulated growth-enhancing measures and aims from Barroso, of the European 2020 strategy to be fit for Europe´s economy of the future. Balancing social, economic, and ecologic aspects for enhancing sustainability shall serve as the right guiding framework for analysis and classification in this approach.

Thus, a cities profile becomes more specific and needs a distinguishing characteristic in each of these domains in order to achieve long-term sustainability. Thus, the mission should incorporate a selection of social, economic and ecological strength and weaknesses and the vision formulate an aspired state for each of these domains. Also guiding principles of behavior should not be unilateral to one of these dimensions, but should formulate social, economic and ecological rules. Each city is unique and to find the right balance between an agile city management and the continuous pursuit of their profile/vision and long-term goals is the challenge each city has to take on. This is the point of focus of the current promotional work.

The integration of a triple bottom line into the profile provides it with the necessary support to maintain identity while adaptively changing in the light of new findings. If some aspects of the profile have to be reformulated in one of the domains (social, economic, ecological), consistency can be achieved via the other domains. This idea of pursuing several ideas in different areas simultaneously is strongly supported by adaption management.

Conclusions

Cities, Destinations and companies underwent a similar history and are nowadays facing similar challenges, like globalization, rapid change and increasing competition. Therefore, it was outlined in this work that successful marketing and management tools developed for companies should also be applied for cities and destinations. When cities, regions and districts are planned and realised in a comprehensive, sustainable and targeted way, communal and regional wealth takes shape much better than in places that follow reactional policies.

In this regard, models and tools tailored to practical needs are important, as well as a new understanding of the management of cities and locations. Location management must therefore be understood as an ongoing and comprehensive process and as a tool of communal and regional development. Just as business management means the doctrine of management and administration of companies, location management should be newly defined as the management and development of cities or locations. Traditional approaches are inadequate. Location management, ie. identity-oriented urban profiling, then becomes a socio-economic or macroeconomic necessity, especially in the context of the increasingly intensive and professional competition between cities and regions across Europe.

The identity-oriented adaptive urban profiling model represents the basis for developing strategies or roadmaps for defining the trajectories of transition for today´s cities. Identity- oriented adaptive urban profiling has already been presented as a useful tool for cities, municipals and destinations to enhance sustainable city development. They can increase their cities attractiveness by providing it with a clear profile, which also leads to identification, that is recognized around the world on the one hand, while flexibly adapting to change if necessary.

Cities that have a clear profile represent strong brands and are aware of their strengths and stage them accordingly. They know the challenges of the times and react with the appropriate measures for identity-oriented location positioning.

They thereby embody the sensation of being alive and express emotions, spreading a radiant power both from the inside and outside. Their communication is authentic and unmistakable. They have residents who are proud of their location. They attract customers, guests and businesses because they inspire and arouse interest. A key success factor for each city is therefore a clear future-oriented and identity-oriented, sustainable profile in the location competition. City brand positioning management must therefore be interpreted as an ongoing and holistic process and as a tool for city and municipal development. Defined in this way, urban marketing and their profiling may be subsumed under the term "identity-oriented urban positioning" through brand development.

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CAPITAL STRUCTURE RATIOS ANALYSIS: RESEARCH OF THE AGRICULTURAL COMPANIES IN LATVIA

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Abstract. Capital structure is one of the determinant factors, which points to the company's solvency problems, particularly in agriculture, where the amount of raised funds significantly affect the company's financial stability. Capital structure ratio analysis of the agricultural companies is one of the signals that may indicate an individual company's solvency problems as well as the sector's problems. Liability and financial stability ratios are the main problem indicators for the company to identify and evaluate the possible threat of insolvency and financial risks timely. Through the above mentioned ratios, any interested person – a company, investor or creditor – can assess the company's financial sustainability.

Based on the analysis of the scientific literature and agricultural statistical data, the aim of this paper is to examine and evaluate the capital structure of the agricultural companies in Latvia, to determine the potential financial risks and problems.

The materials for this research study includes 43 agricultural companies with annual turnover up to 500 000 euros. The analysed data (published annual reports) are reported for the period from the year 2009 to 2015. Economic analysis, data grouping, comparison and graphical methods are applied in this study.

The analysis and examination of the capital structure ratios of the agricultural companies indicates the potential financial risks that may affect the company's financial stability.

Key words: *agriculture, capital structure, financial risk, financial stability, financial sustainability*

JEL code: G33, M41, Q10

Introduction

Agriculture has historically been a significant sector of Latvia's economy. Since the accession of Latvia to the European Union (EU) companies have had access to various government and EU support programmes (subsidies, area payments, funds within EU projects) aimed at promoting company development, financial stability and sustainability. The solvency of agricultural companies and the overall development of the industry is important not only for the government, but also company owners, creditors and potential investors. The capital structure of a company shows how the company funds its daily operations and growth, by using various funds it has raised. Capital structure consists of long-term and short-term debt and equity. Capital structure depends on the structure of assets as long-term investments and current assets.

Capital structure is determined by the company performance and its financial situation, the aggravation of which can lead a company to insolvency. When analysing the financial health and potential growth of companies, their owners, creditors and investors examine financial ratios, which reflect how the company has been managed and how efficiently the invested money has been used.

The assets of agricultural companies equal to those of manufacturing enterprises, which invest their funds in purchasing fixed assets, i.e., land and machinery as well as in acquiring current assets, such as raw materials, spare parts, chemicals etc. Moreover, a significant part of assets may consist of the short-term investment position, work in progress, which includes the harvest of the following year that is not obtained yet, but the preparation for obtaining it has started (e.g., winter crops have been sown). One of the main resources of agricultural companies is their land that may belong to the company (a long-term investment) or be rented which is position under costs, however forms a part of the total turnover. Another position that is specific to crop farming companies is annuals or the harvest of the current year (current assets) which is evaluated in terms of money, while in companies engaged in cattle breeding, biological assets (cattle) are listed both under the long-term investments (cattle that manufacture products over several years) and under current assets (cattle that manufacture products within one year (chicken, rabbits)). A balanced capital structure and corresponding investments in fixed assets is how an agricultural company can promote its future growth, be profitable and invest in its future.

The research object is 43 operating agricultural companies in Latvia and the analysis of their capital structure ratios.

The aim of the paper is, based on the analysis of the scientific literature and agricultural statistical data to examine and evaluate the capital structure of the agricultural companies in Latvia, to determine the potential financial risks and problems.

The aim implies the following tasks:

1. To analyse and select capital structure ratios that will be used for analysing Latvian agricultural companies;
2. To calculate the selected ratios based on the annual financial statements submitted by the companies;
3. To assess the capital structure of the companies;
4. To offer recommendations for further operation of the companies.

This research study data and methods: The materials for the research study are the published annual financial statements of 43 operating agricultural companies for the period from year 2009 to 2015, the limitation for selecting the companies was their legal form – a private limited company where there is a balance sheet, profit and loss account and cash flow statement, and net turnover up to 500 000 euros. The financial statements were acquired from the IT company Lursoft IT (Lursoft 2017). The methods applied in this study include economic analysis, data grouping, comparison and graphical methods.

Research Results and Discussion

1. Selection of the capital structure ratios for the express analysis of Latvian agricultural companies

The company capital structure shows how a company funds its daily operations and further development by using different sources of funding. The capital structure shows not only the return from investment in equity capital, but also if a company is capable of surviving recession. The company capital consists of two parts: the equity capital and borrowed capital. Each of these components of the capital has an important role in the company operation. The main components of the **equity capital** are the contributed capital that is an initial investment that determines owners' investment in a company. The other component of equity capital is retained earnings, which shows the profit the company has had in the previous years, which has been retained in the company to strengthen its balance sheet or invest in the company development, for example, by purchasing assets. The **borrowed capital** as a part of the capital structure shows the borrowed funds that provide for the company operation. The borrowed capital falls into long and short-term liabilities. When analising the capital structure, one of the main questions is: what is the balanced capital structure that can provide

for a successful operation of a company? Should it consist of a bigger borrowed capital to gain a bigger return or the proportion of the equity capital must be bigger than the borrowed capital thus making the operation of the company less risky and avoiding problems regarding financial stability. Agricultural companies raise both: equity capital and borrowed capital as well as various various funds (EU) and government support programmes. Consequently, the capital structure is one of the main factors that indicate problems regarding the company solvency.

In scientific literature, extensive research has been devoted to financial analysis. The research deals with company insolvency models based on financial ratios (Beaver 1968, Altman 1968, Altman, Hotchkiss 2006, Altman et al.2015, Ohlson 1980, Ooghe, Prijcker 2008, Sneidere 2009, Al-Kassar, Soileau 2014, Liang et al. 2016). The aim of these models and analysis in the reviewed articles is, based on analising financial ratios, to provide a timely forecast and identify the possible insolvency of a company. Pindado and Rodrigues (2004) when analising insolvency in small companies, chose 42 ratios, from which, based on the equity capital indicator, they analysed the return on equity, financial autonomy (equity/assets) and leverage ratio (borrowed capital/own resourses). Liang et al. (2016) extricates 9 capital structure ratios in order to assess the company degree of financial leverage and financial autonomy.

The analysis of the capital structure ratios is just one of the solvency assessment measures to be undertaken for the general assessment of a company. However, this analysis already outlines the first financial problems therefore in this research the author will perform an express analysis of the capital strauctures ratios to evaluate if the selected ratios provide signals about the potential financial problems derived from the capital structure.

As it follows from the analysis of scientific literature, researchers offer a lot of different ratios for performing the capital structure analysis, however, the author considers that in order to establish whether a company is financially stable and to perform an express analysis it is enough with a few ratios which show the main connections between the equity capital and liabilities, assets and profit. Thus for a further express analysis of capital structure ratios the author has chosen 3 indicators: *Equity ratio: equity / total asset, Financial leverage: debt / equity, Return on Equity (ROE): net profit / equit.*

Equity ratio: equity/total assets indicates, what part of assets is funded from the company's equity or owner's funds, which in its turn serves as an indicator of the company's **financial leverage: debt/ equity** showing what part of the borrowed funds is used to provide for the daily operation of the company. Both ratios indicate the proportions between the equity and liabilities, equity and assets. The ratio which shows the return on capital should be used to analyse the profit versus equity or the **return on equity (ROE): net profit/ equity*100%,** which features the capacity of the company to get a return from its investments in its own equity.

An integral part of the liability structure of agricultural companies is both long and short-term liabilities. When analysing the capital structure, the total liabilities are analysed against equity because the operation of agricultural companies is characterised by seasonality that determines the cash flow as the settlements for the harvest are made in autumn, however, to start the spring preparatory work there is a need for borrowing current assets. Small farmers perform spring preparation work at the expense of their partners (product buyers), by purchasing raw materials on credit from a business partner and settling the payments from the harvest, which is reflected under the short-term liabilities. The small companies though are not able to raise long-term loans as they do not have the collateral for that. This is why, when conducting the analysis, total liabilities were considered.

Another important component of equity is the revaluation reserve of long-term investment that is directly related to the long-term investments of assets. The agricultural companies that own land can make the revaluation of the land (not more often than once in three years), which allows increase the value of their equity because the value of the land rises.

The relations between the analysed ratios depend on the specific industry and kind of enterprise therefore the calculated ratios were compared with the industry ratios provided by Lursoft (SIA Lursoft IT 2017).

2. Analysis of the capital structure ratios of Latvian agricultural companies and their assessment, years 2009 - 2015

The operating Latvian agricultural companies analysed in the article were selected by their legal form: a private limited company and by economic activity: crop farming and cattle breeding. The companies had filed their financial statements for years 2009 – 2015 comprising their balance sheet, profit or loss account and cash flow statement. The net turnover of the selected companies was up to 500 000 euro.

Equity ratio: equity/ total assets. This ratio is used to assess how the company invests its funds: the higher the ratio, the more attractive it is for the potential investors, creditors and company owners. It also characterizes the company solvency and business sustainability. Table 1 shows how the analysed companies make investments, calculations were not made for the companies with a negative equity.

Table 1

The number of analysed companies for the equity ratio in Latvia, 2009 – 2015

Year	Up to 0.50	0.51-0.70	0.71 - 1.00	Not calculated
2009	16	4	14	9
2010	18	2	15	8
2011	21	4	13	5
2012	17	3	15	8
2013	17	6	12	8
2014	19	4	12	8
2015	18	3	14	8

Source: author's calculations based on Lursoft data base.

From the overall calculations it must be concluded that the companies fall into two groups regarding their solvency: the ones whose ratio is up to 0.50 and those whose ratio is between 0.71 and 1. The analysis suggests that in a half of the companies' investments are not sufficient which might suggest their low equity and the funding of the rest of the assets by the borrowed capital. These companies should reconsider their investment strategy in assets. The companies in category 0.71 – 1.00 have sufficient equity to fund all or a major part of their assets by equity and to make corresponding investments in assets. This suggests correct use of their capital for the company development. Such companies will be more attractive for the potential creditors and investors because the ratio suggests that the company is less risky and more sustainable for providing for their operation and development.

Table 2

Lursoft average solvency ratios in the agricultural industry of Latvia, 2009 – 2015

Year	Median	Highest quartile
2009	0.23	0.87
2010	0.66	0.98
2011	0.58	0.87
2012	0.56	0.85
2013	0.58	0.86
2014	0.61	0.86
2015	0.58	0.85

Source: author's calculations based on Lursoft data base

As it follows from the Lursoft (2017) data in Table 2, the average industry ratio for solvency in recent years has been between 0.58 and 0.61. There are rather few companies in this range – from 2 to 6, however, these companies also should improve their solvency indicators because the higher will be the equity, the higher the investments in assets. When making

investments in assets, it would be important to remember one of the golden rules of the balance sheet that equity is used for funding long-term investments which allows to retain a stable financial structure of a company.

Financial leverage ratio: debt/ equity. The ratio is considered the best for describing the capital structure and the degree of the company risk. The ratio shows the amount of debt per unit of money invested in the equity. If the liability section of the company exceeds equity, it means that the company is characterized by agressive capital structure and, consequently, it is riskier for investors and creditors, although the risk may be directly related to the company development. The above-mentioned ratio compares the total liabilities of the company with equity financing. A high ratio indicates that in financing the equity the major part of funding is provided by creditors rather than owners. A big proportion of liabilities is considered a sign of business risk because there is a significant involvement of borrowed capital. If the indicator increases when years pass by, the dependency of the company on the creditors increases as well.

Table 3

The number of analyised companies for the financial leverage ratio in Latvia, 2009 – 2015

Year	Up to 0.25	0.26-0.40	0.41-1	Above 1	No liabilities	Not calculated
2009	12		4	16	2	9
2010	11	1	3	18	2	8
2011	11	2	4	20	1	5
2012	8	4	5	16	2	8
2013	10	2	4	17	2	8
2014	10	2	5	18		8
2015	9	4	6	14	2	8

Source: author's calculations based on Lursoft data base

Among the analysed companies there are ones that in some periods do not indicate any liabilities, consequently it is assumed that the operation of the company is funded from its equity and the ratio is not calculated. Similalarly, the ratio is not calculated for the companies that have negative equity (Table 3). As we can see from Lursoft (2017) data in Table 4 the average ratio over the years has fluctuated from 0.00 to 0.37, in Table 3 on the analysed companies it can be seen that most companies fall in the categories of up to 0.25 and above 1. The enterprises in category up to 0.25 are cautious in raising investments or, based on the existing financial data, the companies cannot raise additional funding and successfully develop in the future.

Table 4

Lursoft average financial leverage ratios in the agriculture industry of Latvia, 2009 - 2015

Year	Median	Highest quartile
2009	0.12	2.75
2010	0.00	0.45
2011	0.33	1.35
2012	0.37	1.31
2013	0.35	1.29
2014	0.31	1.15
2015	0.36	1.21

Source: author's calculations based on Lursoft data base

Most of the analysed companies belong to the category above 1 which means that the financial leverage is low and additional analysis might be devoted to analysing why the liabilities exceed the equity so significantly, if the raised funds are invested in the company development by purchasing fixed assets or used for covering debitor debt or purchasing current assets. It must be considered that the liabilities considerably exceed the equity, which means, the company will not be able to meet its liabilities with its own equity. Virtually a half of the analysed companies are dependent on creditors thus putting under threat their independence, ability to attract investors and additional funding. As the author indicated in

the Introduction, for calculating the ratios the total liabilities were taken into account, however, in further research the usefulness of considering long and short-term liabilities separately should be assessed. The companies, which do not have liabilities, should evaluate if the funding the company development solely from equity is not too expensive because equity is more expensive than the borrowed capital. It should also be assessed if not raising borrowed capital does not limit further development of the company.

Return on equity: net profit/ equity *100. This indicator is used to assess the profit from one unit of money invested in the equity. It is recommended that this indicator is compared with other companies within the industry as well as with the average indicator of the industry to assess how effectively the company works.

In the indicated period there were companies among the analysed ones whose equity was negative, the companies which worked with losses. The number of the above-mentioned companies is listed in Table 5.

Table 5

The number of analysed companies in Latvia with a negative equity and losses, 2009 - 2015

2009		2010		2011		2012		2013		2014		2015	
Neg. equity	Losses	Neg. equity	Losses	Neg. equity	Losses	Neg. equity	Losses	Neg. equity	Losses	Neg. equity	Losses	Neg. equity	Losses
9	25	8	19	5	15	8	19	8	19	8	17	8	17

Source: author's calculations based on Lursoft data base

The data in Table 5 show that out of 43 companies, eight to nine companies have negative equity, which means that the company works by not using its own funds, but rather at the expense of others. The only exception here is year 2011 when the number of companies with negative equity fell to five. The period of analysis suggests that four companies have had a negative equity for all 7 years that were analyzed. A negative equity arises as a result of losses, the profit dynamics changes over years, however, it is not sufficient to make the equity of these four companies more positive. The loss dynamics shows that year 2009 was the worst, when 25 out of 43 companies ended the year with losses which consitutes more than a half of the analysed companies. The best year was 2011 when only 15 companies finished the year with losses. A similar trend is seen in the equity dynamics where in average 17-19 companies worked with losses. The decreasing of the equity takes place following a drop in profits or due to losses and inability to raise additional investments which, in its turn, suggests that there is an unfavourable financial situation in the company (Sneidere 2009). The operation of agricultural companies is influenced not only by such factors as funding and costs, but also the ones like national foreign policy and nature factors that can make a significant impact on the financial results of the company.

When calculating Return on equity (ROE) in Table 6, the author did not apply ratios for the companies that in the same year had both – a negative equity and losses. In 2011 there were just three such companies, in the other years five to seven.

Table 6

The number of analysed companies for ROE in Latvia, 2009 – 2015

Year	Negative ROE	ROE up to 6%	ROE from 6.1 - 10%	ROE from 10.1 - 25%	ROE from 25.1 - 50%	ROE above 50%	Ratio not calculated
2009	21	1	5	5	1	4	6
2010	16	4	5	2	4	7	5
2011	13	9	3	5	3	7	3
2012	16	6	2	4	6	4	5
2013	13	9	4	4	4	2	7
2014	15	11	1	7	2	2	5
2015	15	13	1	4	3	2	5

Source: author's calculations based on Lursoft data base

The table of ROE indicators shows the number of companies that are developing a negative ROE and the number of companies ROE was not calculated for. The analysis of the negative ROE suggests that in period between 2009 and 2015 the number of companies with a negative indicator has decreased, which means that the companies have been able to earn profit.

Compared to Lursoft data about the industry (Table 7), the average indicator of the industry is negative as well – 6.61, the conducted analysis shows that in year 2009 for 27 out of 43 companies the indicator might not have been calculated which already is a sign of financial problems in the industry.

Table 7

Lursoft average ROE indicators for agricultural companies in Latvia, 2009 – 2015

Year	Median	Highest quartile
2009	-6.61	0
2010	0.00	6.74
2011	13.1	36.16
2012	16.6	39.40
2013	10.43	28.81
2014	6.63	23.82
2015	6.71	21.42

Source: author's calculations based on Lursoft data base

The average ROE indicator changes over years. This is confirmed by the above mentioned analysis of the companies where the equity capital and profit are positive. Meanwhile, when comparing group indicators, we must conclude that majority of the companies operate with a close to average indicator, which is up to 6%.

From the analysed 43 companies five to eleven companies were able to raise their profitability above the average indicator of the industry and reach the profitability of above 25%. This suggests that in the current research sample of the companies it is possible to raise profit indicators to create a positive equity and promote the company development. One of the ways how companies could improve their equity indicators is to revaluate long-term reserves, if the company owns land, which will not be a long-term solution, however. The company must reconsider its operation, analyse the profit entries, consider the possibilities for participating in the EU programmes and revise the use of the government support payments (area payments, subsidies) in order to work with profit and prevent the situation where the equity is negative.

Table 8

Summary of the analysed results of the researched sample of agricultural companies in Latvia, 2009 – 2015

Criterion	2009	2010	2011	2012	2013	2014	2015
Negative equity	9	8	5	8	8	8	8
Negative ROE	21	16	13	16	13	15	15
ROE up to 6%	1	4	9	6	9	11	13
Solvency up to 0.50	16	18	19	14	16	19	17
Financial leverage above 0.40	18	21	25	20	21	23	20
Positive equity and profit	16	22	27	22	23	23	23

Table 8 summarizes the main results of the analysis which suggests that in the period of the analysis the most successful was year 2011 which might be related to the high productivity of crops and good price conditions in agriculture. Approximately 18% of all the analyzed companies work with a negative equity and for four of them the equity was negative all over the year. The negative ROE dynamics shows a decreasing trend over years, which suggests that companies are able to decrease losses and the number of companies with the return of up to 6% has increased. For almost a half of the companies the solvency was below 0.50, which might indicate the insufficiency of their equity. Moreover, their financial leverage was above 0.40, which means that their liabilities do not exceed equity and the companies may face financial problems in meeting their liabilities.

Almost a half of the 43 companies have a positive equity and they are profitable which suggests that the industry as a whole has the capacity to earn, there is a potential to develop it and provide for its financial sustainability.

Conclusions, proposals, recommendations

In accordance with the aim of the research the author has analysed and assessed the capital structure ratios of 43 operating agricultural companies in Latvia and as a result of the analysis has arrived at the following conclusions:

1. Four companies had negative equity over the whole period of the analyses, in three of those the negative equity is rising which signals financial problems. Six companies have managed to raise their equity from negative to positive as a result of their own work, two companies have have had a negative equity for recent two years, which means that the factors influencing company operation may vary. In 20 compnaies the equity was rising which is a positive trend and suggests the financially stability of the company.

   A negative equity is the result for the operation of the company with losses which leads to a fall in the equity capital. The company owners should consider the possibilities for raising their equity by making their own investments in the equity or by the revaluation of the long-term investments (fixed assets).
2. Profit indicators vary quite a lot, for example, over the whole period only eight companies managed to close every year with a profit, however the rest of the company profit indicators changed across the years. A positive trend is suggested by eleven companies which managed to close the financial year with a profit by coming out of losses. Profit is the aim of business therefore it should be assessed where the funds are invested, what the costs are, how justified they are and to analyse how the company could raise its productivity and work with positive profit. The companies must also work on transforming their negative equity into a positive one in the future by providing for that with their profit.
3. ROE ratio shows the profit per one euro invested in equity. Taking into account the previously mentioned conclusions about the negative equity and profit indicators, the financial performance of the rest of companies

must be assessed as average because the ROE of most of the companies is below the industry average. As a positive feature, must be mentioned that the number of the companies with a negative ROE is decreasing, which means that the companies are able to work with profit which, in its turn, improves the equity ratios.

4. The analysis of the equity ratio shows that in average a half of the companies insufficiently used their funds for financing assets, while the other half followed a well-considered investment strategy thus increasing their capacity and fostering future development.

   The companies with the ratio below 0.70 must assess the distribution of funds and the possibilities to increase the financing of assets with their own funds, which would allow them to improve their financial ratios, solvency and become more attractive for investors for raising additional funding. Investing in fixed assets provides the company with the stability for ensuring its own operations.

5. Financial leverage is one of the most important indicators for assessing the risk of the company, its dependence on creditors as well as its debt per one euro invested in its equity. The higher the indicator, the bigger the dependence on creditors; if ratio 1 is exceeded, the liabilities of the company exceed the equity which serves as the evidence for possible financial problems also when approached through the financial analysis. The data from the analysis show that in most companies the proportion of liabilities in the equity exceeds 1 which suggests that the company is characterized by high risk and there is a high likelihood that it will not be able to settle its liabilities because it is funded by creditors. In 18 companies the liabilities decreased in the analyzed period, however they increased in the rest of the companies.

   The companies with the above average industry indicator (0.56) should consider decreasing their liabilities, their repayment from their profit or increasing the company equity through owner investmernt in the equity.

The conducted analysis leads to the conclusion that eight companies have financial problems that can cause insolvency and, consequently, bankruptcy. If these companies plan to continue their work, they must reassess all main performance indicators, possibilities for improving their profit indicators, as well as their asset entries because these companies are already facing problems in meeting their liabilities, which may lead to filing for insolvency. If the companies cannot raise funds from banks, they must look for the possibilities to use the support funds allocated for farmers or consider raising alternative funding from the non-bank sector.

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ICT INDUSTRY'S DEVELOPMENT AS GROWTH POTENTIAL IN LATVIA: COMPARISON WITH OTHER EU MEMBERS

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Abstract. Nowadays, Information and Communication Technology (ICT) is a crucial component of all economic activities, it can promote innovation and raise economic growth. The importance of the ICT sector has grown over time; it is also forecasted that ICT industry's will increase even more in future.

ICT sector's development in Latvia demonstrates its capacity in growing number of companies, its share in GDP, the number of employees, and number of specialists. But by closer look the research results indicate that Latvia has lower share of ICT specialists in total employment in year 2015: 2.2% comparing to 3.5% in EU average (Europe Commission, 2017). Also, the ICT sector export in % of total service exports in Latvia is only 24.3% in year 2015 that is lower than the average in EU countries (36.5%).

The study examines correlations and the Granger-causality between several ICT sector's indicators and GDP per capita growth rate in EU. Results show positive correlation between relative share of ICT specialists in employment and ICT sector share in total service export. Thereby it can be stated that the sufficient numbers of skilled ICT specialists will not only influence positively the productivity of companies, but also will generate surplus to GDP. Furthermore, it makes the region more attractive to global companies, who are interested in outsourcing the task. Strong uni-directional Granger -causality from ICT investment to real GDP per capita growth was found already from the first lag, but vice versa relationship is significant only after two lags. Application of panel Granger causality test in vector error correction (VECM) form confirms previously found conclusion both in the short-run and in the long-run.

Key words: *ICT sector, ICT specialists, economic growth, panel Granger causality*.

JEL code: O39

Introduction

The impact of Information and Communication Technology (ICT) on economic growth and development has nowadays proven to be significant for almost all national economies (Mattioli, Lamonica, 2013). Information technologies can be defined as the utilization of computing via hardware, software, ICT services and infrastructure to create, store, exchange and leverage information in its various forms to accomplish any number of objectives. Additionally, the term encompasses the workers that develop, implement, maintain and utilize information technology directly or indirectly. In this way ICT sector can be described as high added value industry that is closely integrated in economy by its strategic position. In 2013, the ICT sector accounted for 5.5% of total value added in average, this share showing large variations across countries, ranging from 10.7% of value added in Korea, 7% in Ireland and Japan, followed be Sweden and Hungary (over 6%) to less than 3% in Island and Mexico (OECD, 2015). In Latvia, ICT sector accounts for 4.8% of overall GDP that is less than the average mentioned above. Respectively, the sector's characteristics have to be analysed and its development preconditions could be investigated further, which will not only contribute the growth of importance of the sector but also give contribution to the evolution of the economy.

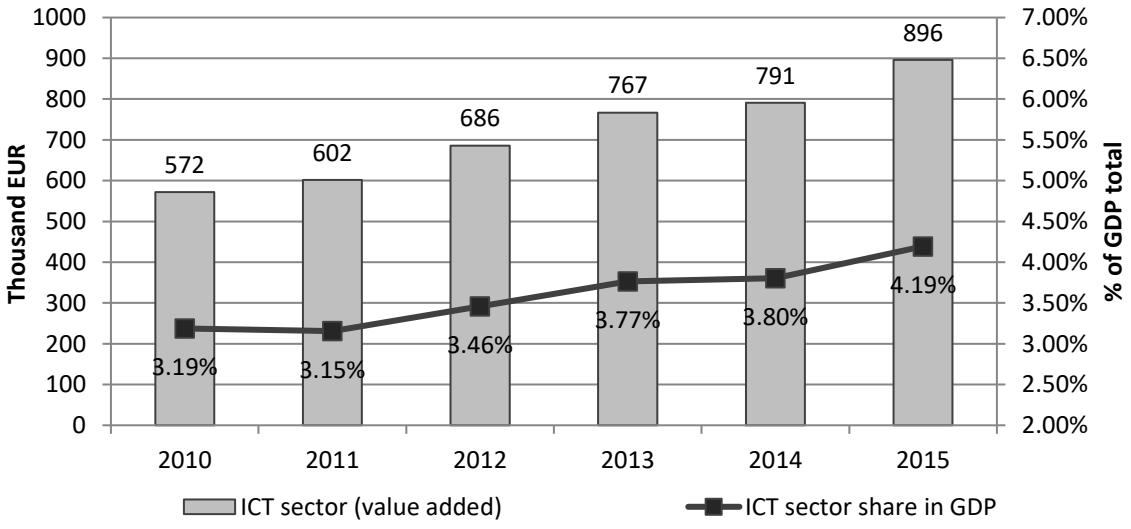
The paper is organized in sections. Next section describes ICT sector development in Latvia. Third section presents several scatter grams revealing relationships between variables of interest for EU28 countries. The following section shows Granger causality test results and comparison of our results with previous studies, and, finally, there is a discussion about the implication of the results and conclusions.

Characteristics of ICT Sector in Latvia

ICT sector can be described as high added value industry that is closely integrated in economy by its strategic position. Researches are sure that development of ICT sector represents a supporting and driving force for national economies (Mattioli, Lamonica, 2013).

OECD defines the ICT sector as a combination of manufacturing and services industries that capture, transmit and display data and information electronically (OECD, 2007). The ICT sector consists of all companies producing electronic and digital technology for the transfer of information, knowledge, and innovation. To describe the ICT position in the economy different metrics can be used: output of the industry, its share in GDP, the number of employees, number of specialists, number of enterprises and other measurements.

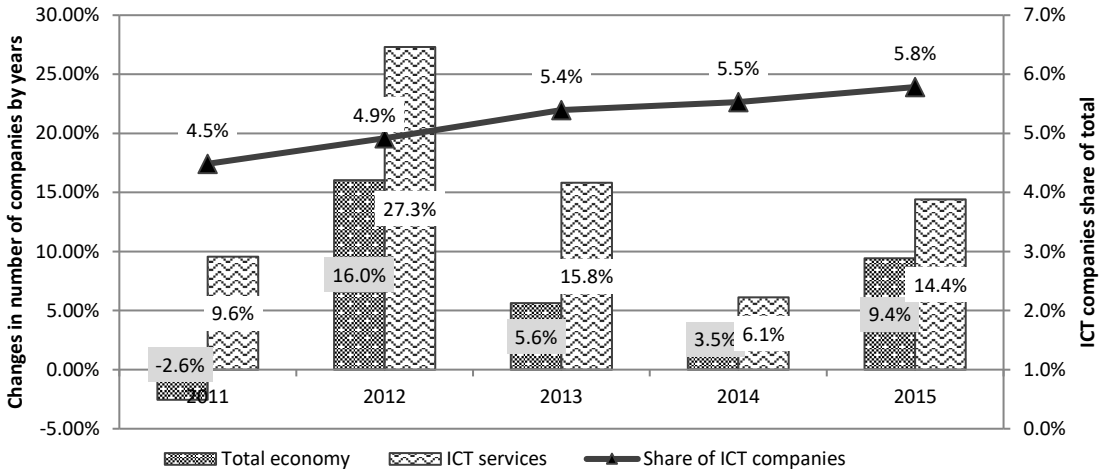
Figure 1 shows a growing trend of the ICT sector's value added and its growing importance in national economy of Latvia. ICT sector's value added in previous five years were increased by 56% (with 9% average annual growth rate), and ICT sector share from 3.19% in year 2010 has grown to 4.19% in year 2015.



Source: author's construction based on CSB data

Fig. 1. **ICT sector value added and its share in total GDP**

Likewise, the growing number of companies in Latvian ICT sector demonstrates the attractiveness of industry and its growth potential that resonates with the sector's growth forecasts globally. For example, CompTIA's consensus forecast projects 4.9% worldwide IT industry growth in year 2016 (Comptia, 2016) that is more than total economies growth forecasts for the same time: 3.4% (IMF WEO, 2016). It can be seen from there that growth trends of ICT companies in last years significantly exceed the growing rate of number of enterprises in Latvia (Figure 2).



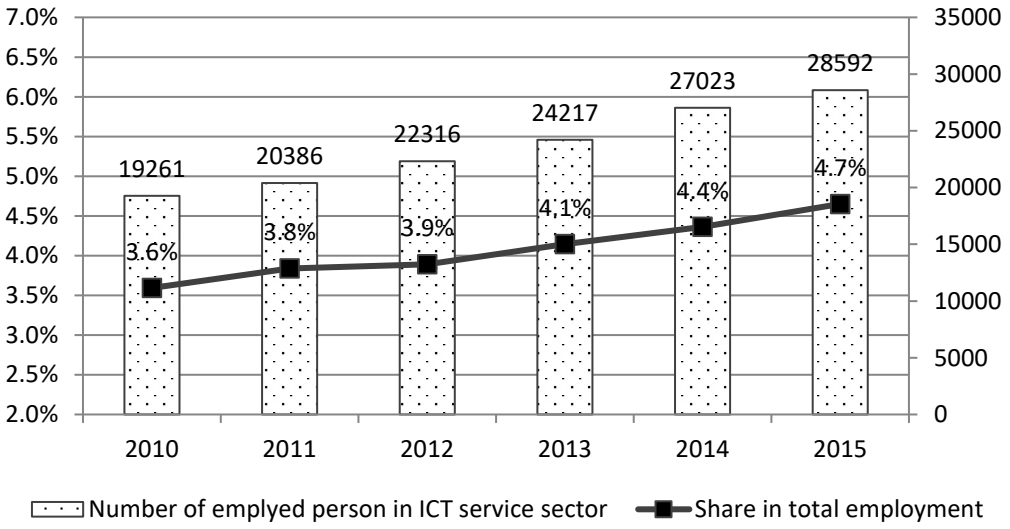
Source: author's construction based on CSB data

Fig. 2. **Changes in number of enterprises**

Growing numbers of the sector's enterprises show the industry's attractiveness for the business. Furthermore, growth in number of ICT companies significantly exceeds the changes of number of companies in total.

Professional workforce is a resource that is particularly important in such knowledge based industry as ICT sector. To describe its distinct elements of the IT workforce, two of them have to be noted: employment in the ICT sector and IT occupations spanning all industry sectors.

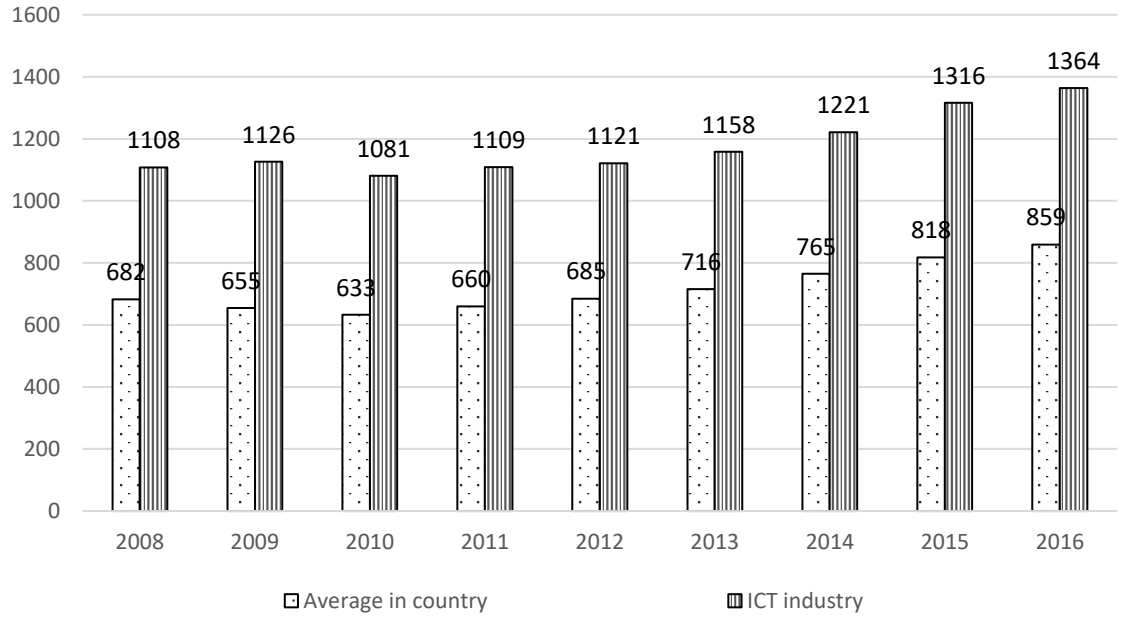
ICT industry employment includes technical occupations, such as software developers, network engineers, computer support specialists, as well as also includes non-technical professions, such as sales, marketing, HR, finance, operations and general management that support and facilitate the operation of ICT companies. ICT industry's employment is growing not only by numbers of persons but also by its relative share in total employment of economy in Latvia (Figure 3).



Source: author's construction based on CSB data

Fig. 3. **Number of employees in ICT sector**

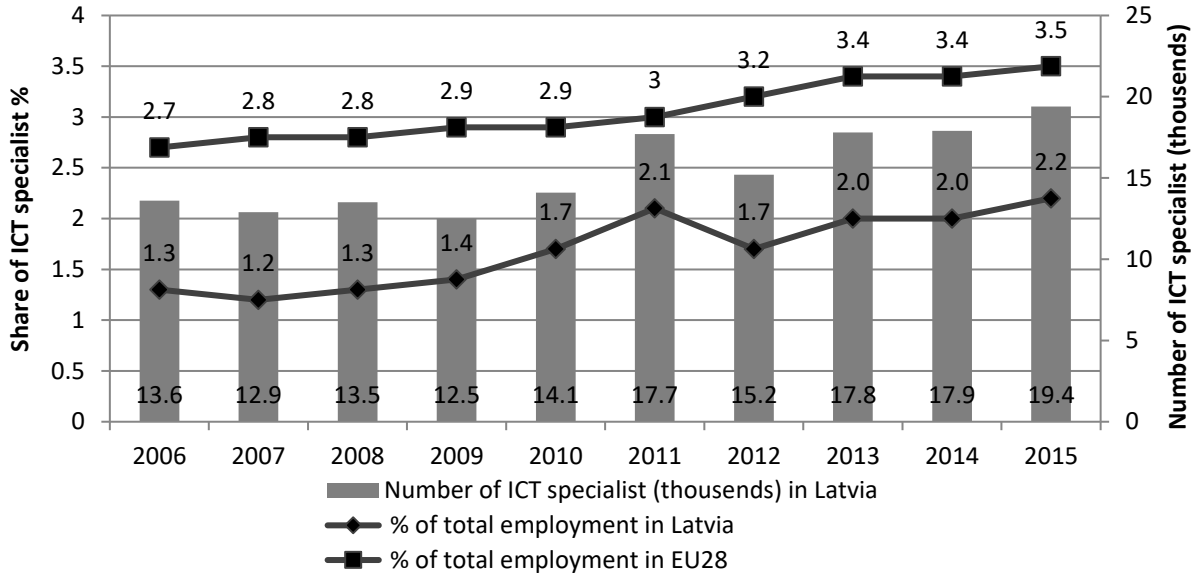
Employees in ICT industry are well payed, and the industry also has second highest average salaries (1364 EUR in year 2016) among all industries, which is 159% from average salary in the country (859 EUR, 2016). Higher average salaries are only in finance and insurance sector (CSB, 2017).



Source: author's construction based on CSB data

Fig. 4. **Average salaries**

However, driving force of every industry is not only the persons employed in the industry but the available specialists who have adequate education, skills and abilities to promote industry's further growth. ICT specialists are defined as those, who have the ability to develop, operate and maintain ICT systems and for whom ICTs constitute the main part of their job (OECD, 2004). ICT occupation employment includes specialists, who have adequate education, skills and abilities for technical occupations, such as software developers, network engineers, computer support specialists, etc. working in a range of industry verticals, such as healthcare, education, manufacturing, professional services and others. Unfortunately, the number of ICT specialists cannot be regarded as sufficient in Latvia. Comparing the ICT specialist share in total employment in Latvia and in average of EU countries, numbers depict that it is considerably behind the average employment rate of EU countries (Figure 5).



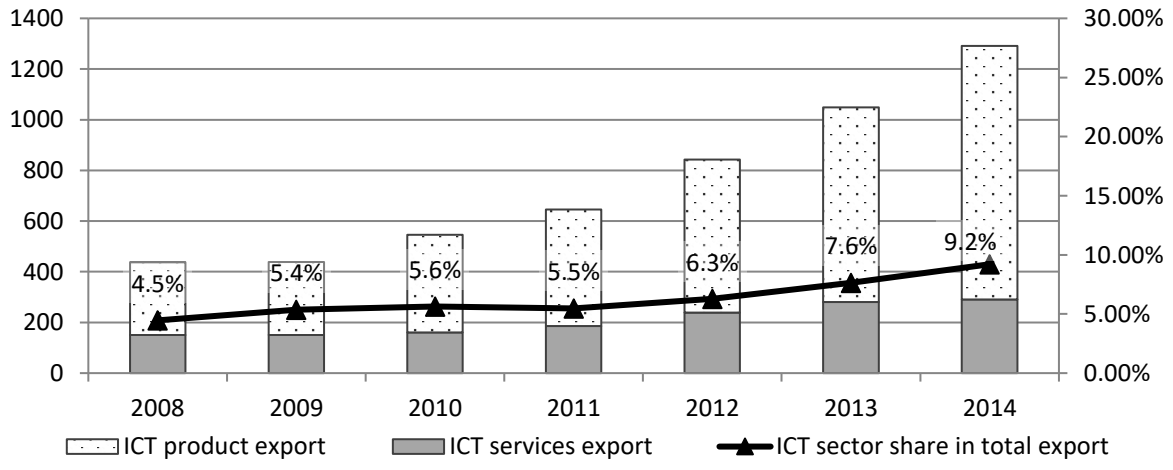
Source: author's construction based on Europe Commission data

Fig. 5. **Number of ICT specialists**

According to Eurostat, the employment growth rate for ICT specialists has remained on an upwards path averaging 3% growth per annum since year 2006, i.e., it was more than eight times higher than the average growth rate of total employment over the same period (Eurostat, 2015). It can be stated that having a pool of specialised ICT workers is a critical factor in ensuring a country's comparative advantage in the development, installation and servicing of ICTs.

Export and economic growth relationship has been a long discussion among the researchers (Albiman, 2014). The researchers prove the existence of positive relationship between trade openness and economic growth. For example, some theory argues that, when a country participates in international trade, it will increase technological progress and increase more efficiency through better allocation of resources. Furthermore, trade openness can simplify this process of technological progress (Sakyi, 2011; Adhikary, 2011; Yucel,2009).

ICT sector depicts stable export growth trends in the recent years in Latvia (Figure 6) that may be one of the proofs of the growing importance of the sector and its growth potential for the further development.

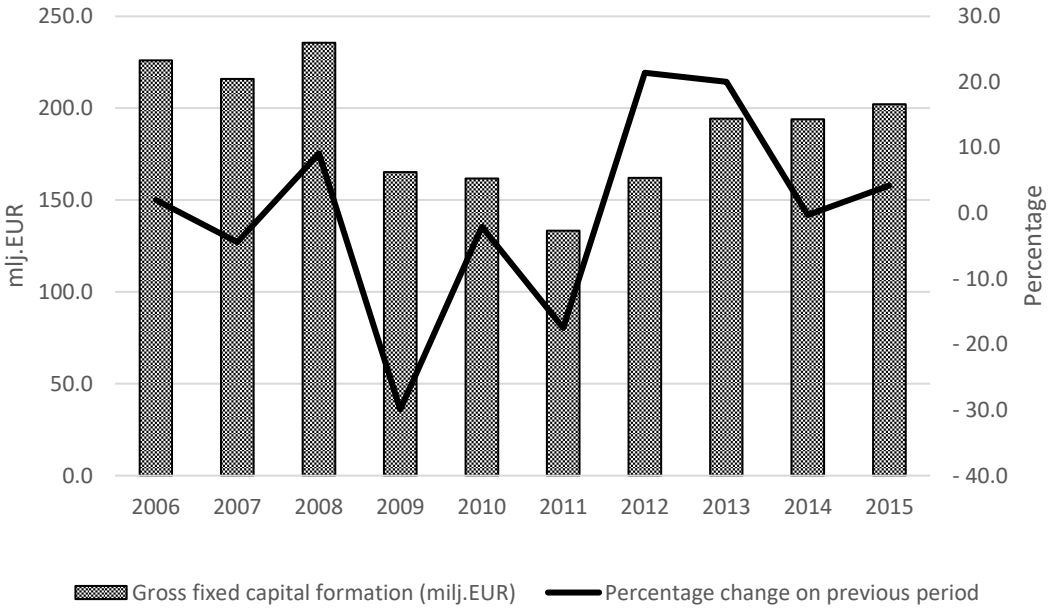


Source: author's construction based on CSB and Bank of Latvia data

Fig. 6. **ICT sector export**

Growing export share depicts high potential of entire ICT industry. But to ensure the industry's further growth, a sufficient number of skilled ICT specialists have to be provided. It will also make the region attractive to global companies, who are interested in outsourcing the task, that accordingly will increase the export volume. Furthermore, the researchers (Hagsten E., Sabadash A., 2014) have estimated that additional employed persons with ICT skills will have not only positive influence on the productivity of companies, but also will generate surplus to GDP.

To characterize the environment of industry development, also the investments could be taken in consideration. As an indicator of investments, the percentage of total gross fixed capital formation (GFCF) will be used. OECD defines ICT investment as the acquisition of equipment and computer software that is used in production for more than one year (OECD, 2015). Many studies have been performed to determine the relationship between ICT investment and economic growth; furthermore, many of them demonstrate a strong positive correlation between ICT investment and economic growth (Jae-pyo Hong, 2017). Eurostat data depicts that the relevant assets related to products that are intended for use in the production of other goods and services for a period of more than a year in ICT industry in Latvia is inconsistent over the period of years 2006-2015 (Figure 7).



Source: author's construction based on Eurostat data

Fig. 7. **Gross fixed capital formation in ICT industry and its percentage change on previous period**

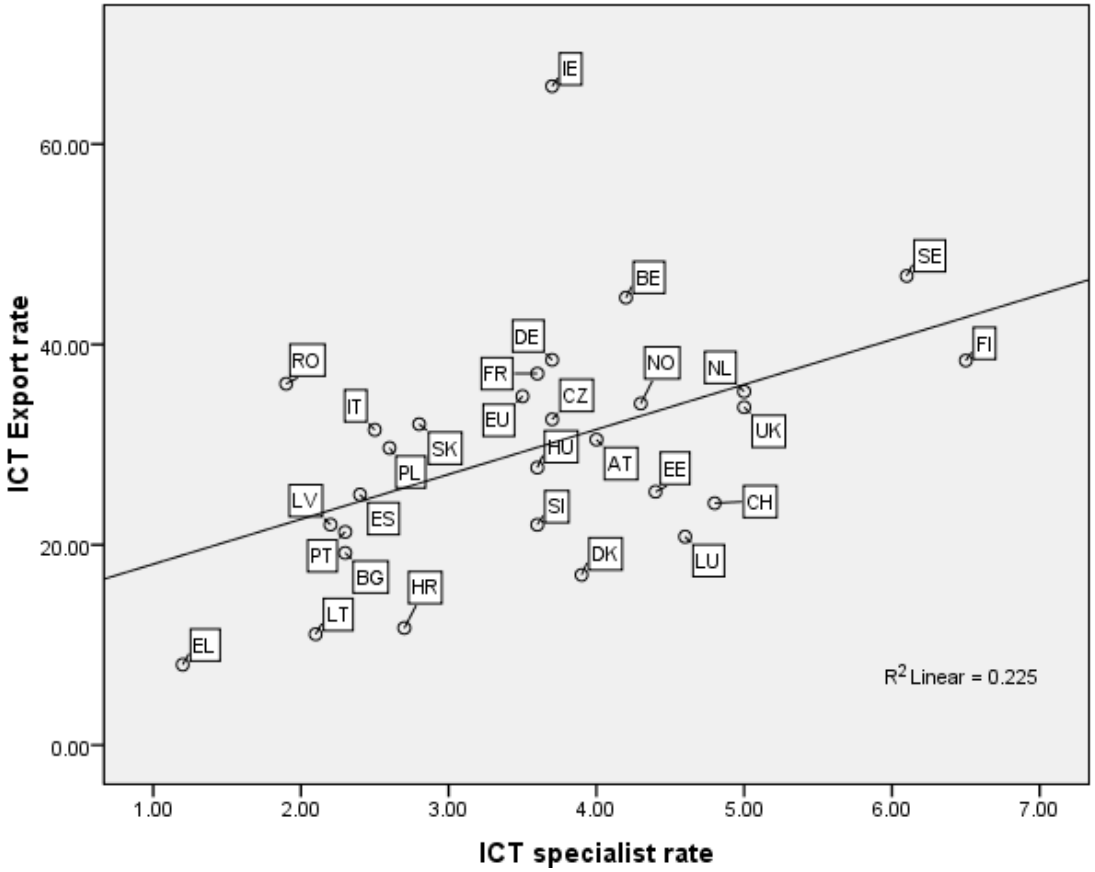
ICT Industry's Indicators and Economic Growth for EU Members: Cross-correlations

Empirical literature about ICT importance can be divided in two big groups. Large number of articles are being carried out to evaluate the ICT influence as general-purpose technologies (GPT) to the performance of business (Bayo-Moriones, 2013), its competitiveness, capability to innovate (Spiezia, 2011), how the investments in ICT affect productivity growth (Edquista, Henrekson,2017), ICT impact to the development of country by its digital competitiveness, and economic effect of ICT (Bartelsman, Hagsten, Polder (2013). Another group examines the impact of ICT sector on the economic growth, separating direct and indirect effect of ICT sector (Keček, Hrustek 2016), economic importance of ICT at the national level (Fatemeh 2009), and analysing the role of the ICT sector in the economics system (Mattioli, Lamonica, 2013). The research results of Lorenzani and Varga (2014) indicates that ICT is regarded to account for 5% of GDP growth and 20% of productivity growth in Europe. Furthermore, Johansson and Lundblad (2015) assert that the

increase of employed with ICT specialist's skills will contribute to the labour productivity. They find out that an increase by 1 percentage point in the percentage of those employed with ICT specialist's skills is associated with an increase in labour productivity by 0.9 per cent on average. In Latvia, the increase of employed with ICT specialist's skills to the average level in EU member countries will result GDP per capita effect of 260 EUR (Johansson, Lundblad, 2015).

To estimate the growth potential of ICT sector, the ICT specialist rate is confronted to the share of ICT sector of total service export in different countries for year 2015. Best performed countries by share of export of total service export in year 2015 are Ireland (66%), Finland (50%), Belgium (46.1%) and Sweden (45.8%), but in EU countries the average is 37%. In Latvia, the share shows only 24% performance that is much less than the average in EU (World Development Indicators).

By comparing the share of ICT specialists in total employment in year 2015, the highest value shows Finland (6.5%), Sweden (6.1%), Netherland and United Kingdom (5% each), but in EU countries the average is 3.5%. Also by this numbers Latvia is falling behind with 2.2% what is one of the worst figures among EU countries.



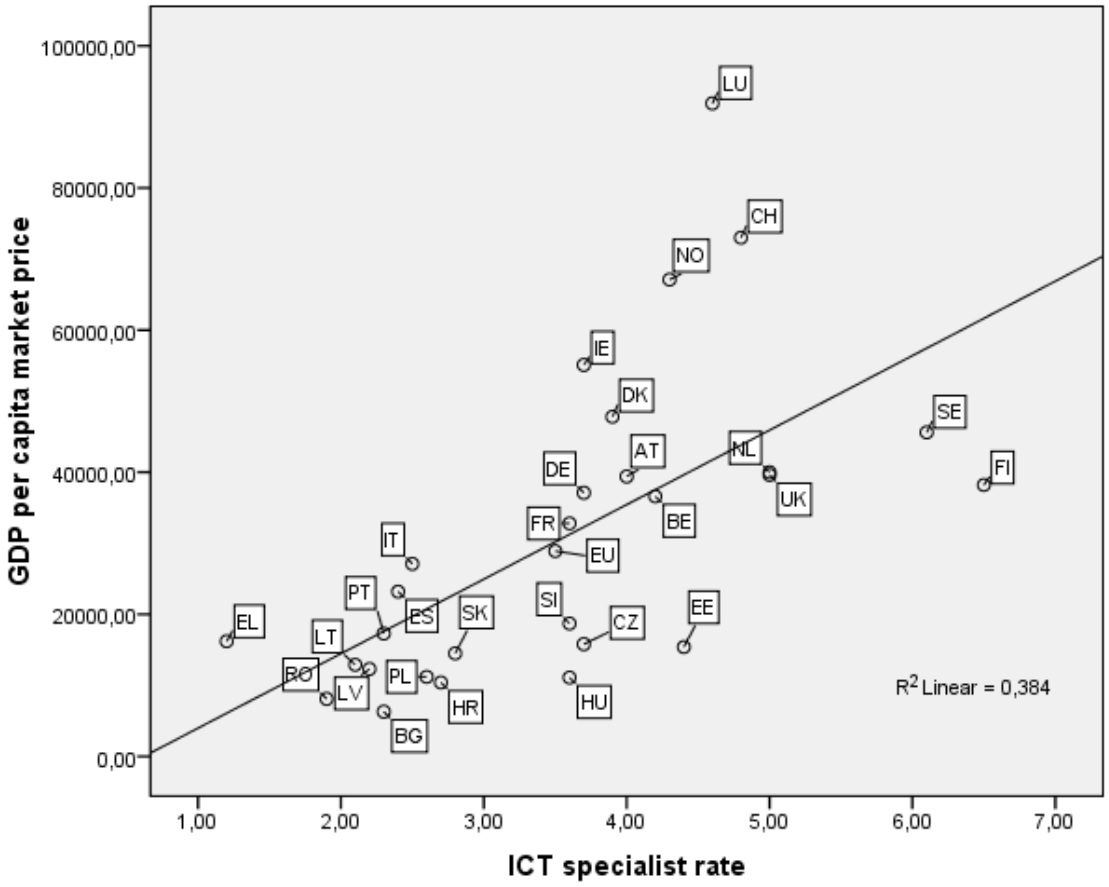
Source: author's construction based on Worl Bank and European Commission data

Fig. 8. **ICT specialist rate and ICT sector export rate relationship analysis**

Using linear regression and correlation analysis (Figure 8) research results show positive impact of the ICT employment share to the share of export of ICT services (Pearson Correlation 0.474) but it has to be estimated as not very strong (R^2=0.225) but still significant (Significance 0.009). The Ireland can be defined as a data outlier because of political strategy of country for foreign direct investments for years. Nowadays, Ireland is second largest exporter of computer and IT services in the world, ICT sector exports share is 40% of total national exports. To understand the Ireland's role in ICT sector globally, there can be seen that there are 9 of the top 10 global software companies, 3 of the top 3 global security software companies, 3 of the top 3 global enterprise software companies, and 4 of the top 5 IT service companies located in Ireland. The sector's traditional players with long-established operations – such as Intel, HP, IBM, Microsoft and

Apple – have been joined by newer companies leading the way in the internet and social media revolution, including Google, Facebook, LinkedIn, Amazon, PayPal, eBay, and Twitter. Their arrival has firmly positioned Ireland as the internet capital of Europe. Ireland is also the European data centre location of choice for world leaders including IBM, Microsoft, Google, Yahoo, MSN and Adobe and is poised to become a global cloud centre of excellence.

As next step to investigate the importance of ICT specialists' to the economic growth, is to confront ICT specialists' rate to the GDP per capita in different countries for year 2015. The GDP is a well-accepted variable for measuring economic prosperity but GDP per capita could be used as a control measurement for income disparity across countries due to population differences.



Source: author's construction based on Eurostat and European Commission data

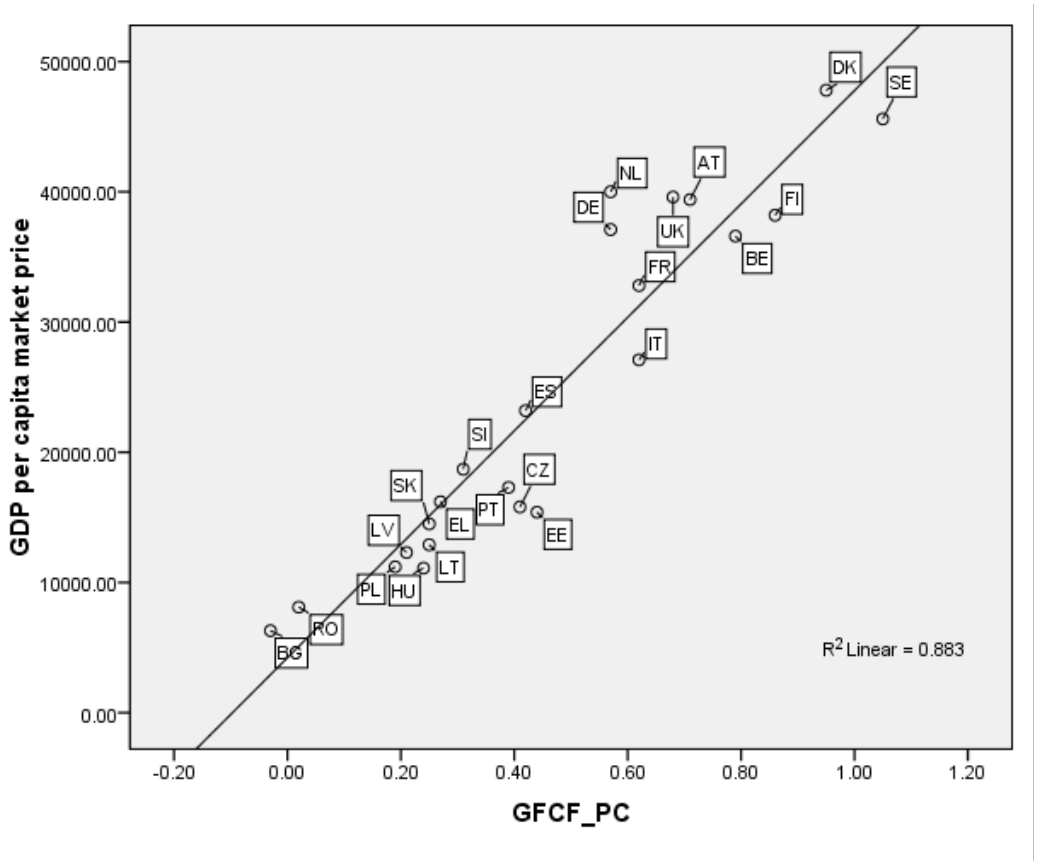
Fig. 9. **ICT specialist rate and GDP per capita relationship analyses**

Using linear regression and correlation analysis, the data analyses shows positive, medium correlation (Pearson Correlation 0.620) and it is significant (Significance 0.00). But also outliers can be determined there: the countries where high value of GDP per capita could not be explained by the developed ICT sector rather than other condition. Luxembourg has the highest GDP per capita in the entire EU. Luxembourg attracts foreign direct investment inflows owing to its political stability and positive labor relations. The country has attracted financial institutions and many hedge funds. Due to its central location, its financial regulatory system and its financial sector, Luxembourg is home to the European Investment Bank, a financial institution of the European Union, and to the European Financial Stability Facility. (Euro Challenge, 2016). Norway and Switzerland is also included in the analyses because of their position in Europe. But also for these counties the reason for high level of GDP per capita has to be looked in other sectors not in the development in ICT sector. Norway is richly endowed with natural resources, such as petroleum, hydropower, fish, forests, and minerals. The high standard of living in Switzerland is due to its financial sector development. Above mentioned Ireland as an

outlier in relationship between ICT specialist rate and ICT sector rate is in top countries with high level of the GDP per capita.

Estimated regression model excluding Luxemburg, Switzerland and Norway shows positive relationship between ICT specialist rate and GDP per capita (Pearson Correlation 0.671) and it has to be estimated as strong (R^2=0.450) and significant (Significance 0.00).

Also, the gross fixed capital formation in ICT industry (investments) is confronted to the GDP per capita in different Europe countries in year 2015. There the gross fixed capital formation (GFCF) of ICT industry shows strong relation to the GDP per capita (Figure 10). As outliers, Luxemburg and Ireland can be identified and accordingly excluded from further analyses. Estimated regression model shows strong positive relationship between gross fixed capital formation and GDP per capita (Pearson Correlation 0.94) and significant (Significance 0.00).



Source: author's construction based on Eurostat data

Fig. 10. **GFCF per capita in ICT industry and GDP per capita relationship analyses**

ICT Investment and Economic Growth: A Panel Granger Causality Test

The analysis in previous chapter was based on evaluation of correlations. However, a strong correlation does not necessarily imply the presence of a causal relationship. For example, the direction of causation between ICT investment and GDP growth can be one or two directional or both. Additionally, an application of causality tests allows to find the number of lags what can be explained as time between change in one variable and response of another variable. In this part, the Pairwise Panel Granger Causality test is chosen because the researches show that it provides the most reliable results in the case of small samples (Jae-Pyo Hong, 2017).

Thus, the objective of this chapter is to investigate if there is a causal relationship between ICT (using investment in ICT sector as a proxy) and economic growth (measured as real GDP per capita annual growth rate) in EU. Estimation is accomplished by using cross-country annual time-series data for 27 EU countries for the period from year 2004-2015. The summary of Pairwise Granger causality tests is shown in the Table 1 (this test was performed following classical approach based on Granger (1969)).

Table 1

Results of the Pairwise Panel Granger Causality Test for EU countries: 2004-2015

	H_0: ICT investment per capita DOES NOT Granger cause rate of growth of per capita GDP		H_0: Rate of growth of per capita GDP DOES NOT Granger cause ICT investment per capita	
	F statistic	Probability	F statistic	Probability
1 lag	19.11	2E-05	2.34	0.1267
2 lags	9.71	8E-0.5	2.19	0.1135
3 lags	9.67	4E-06	6.99	0.0001
4 lags	6.89	0.00003	4.49	0.0015

Source: author's calculations based on Eurostat data

On the left-hand side of the Table 1, the null hypothesis about no causality from ICT investments to GDP per capita growth is rejected already for the first lag. On the right hang side, the null hypothesis about causality from GDP per capita growth to ICT investments cannot be rejected for the first and second lag.

To obtain the estimates for the short run and the long run, we used Vector Error Correction (VECM) model. Granger (1988) suggested two different causalities in this framework: short-run causality is captured from the lagged differences of variables; long-run causality carries its effect through the one period lagged error correction term as the cointegration equation corrects the deviations from the long-run equilibrium (Ayoub, 2015). (Panel unit root and cointegration test results are not presented in the article, VECM tests about no serial correlation, no heteroscedasticity as well). Number of lags in the VECM was chosen according to Information criterion values (lags=2).

Table 2

Results of the Panel Granger Causality Test for EU countries: 2004-2015 using VECM

Null hypothesis	Statistics	Short run causality	Long-run causality
H_0: ICT investment per capita DOES NOT Granger cause rate of growth of per capita GDP	Chi-square statistic (p-value)	13.37 (0.0096)	–
	Error correction coefficient (t-statistic) [p-value]	–	-0.024 (-3.69) [0.0003]
H_0: Rate of growth of per capita GDP DOES NOT Granger cause ICT investment per capita	Chi-square statistic (p-value)	3.462 (0.1770)	–
	Error correction coefficient (t-statistic) [p-value]	–	-0.159 (-3.03) [0.0027]

Source: author's calculations based on Eurostat data

The results from the Granger-causality test on ICT investment and GDP per capita are as follows: short run causality from ICT investments to real GDP is statistically significant (p-value=0.0096), as well as long-run causality with an error correction coefficient and p-value of -0.024 and 0.0003, respectively. Further, the results reported significant long-run causality from real GDP to ICT investments, but short-run causality in the same direction was found to be insignificant since the p-value of the error correction was large (p-value=0.177>0.10).

Conclusions

The research results indicate that ICT sector in Latvia shows growing development trends, it is attractive for business, and gains greater importance in total economy. ICT specialists is a driving force of the sector that not only for ensuring a further growth of the industry but also making the region more attractive to global companies, who are interested in outsourcing the task. Increasing the number of employees with ICT specialist's skills enables businesses to reap the benefits from digitization. A strong digital economy is vital for innovation, growth, jobs, and European competitiveness.

The relationship between ICT specialists' rate in total employment and economy development metrics as Export rate of ICT sector and GDP per capita could be estimated as a positive based on data for different European countries. Respectively, if the number of ICT specialists increase also the GDP per capita will grow. This could not be estimated only as a direct effect after regression model but also throw an indirect evaluation such as higher average salary in the ICT sector. Causality tests results prove that investments in ICT industry is most important driving force to ensure further industry development.

However, more theoretical and empirical research is needed to better understand spillovers and externalities of ICT and how these technologies transform our economies.

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UNIVERSITY RANKINGS: CHALLENGES FOR UNIVERSITIES, PUBLIC ADMINISTRATIONS AND COUNTRIES

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Abstract. University rankings are becoming more and more important for student attraction, for financing attraction for research, for employment of respective university graduates. Several university ranking systems are popular in world and used for references by universities, employer's attitude for respective university graduates.

Tasks for research: investigation of scientific publications on role of university rankings with special attention to role of research results and scientific achievements for university rankings; compare importance of research results and scientific achievements for university rankings in university ranking results in different ranking systems.

The methods used in this study are scientific publication analysis, investigation of university ranking results with special attention to research organisation at the university. Within the framework of the reserch the role of the study of higher education institutions in the facilitating of their place in the international ratings is analysed. There are evaluated and compared the succsess of leading univesities of Baltic states in the more popular international ratings of higher education institutions - QS World University Rankings (QS), The Times Higher World University Ranking (THES), Academic Ranking of World Universities. Particular attention has been drawn to the assessment of the research activity of universities.

There are concluded, that different methodologies are used in the international ratings of higher education institutions, however the evaluation of the reserh activity has significant proportion in all of them. Acquired findings indicate, that the results of research activity of universities have important role in the international ratings of higher education institutions and the improvement of these results facilitates the place of higher education institution in the ratings, thus fortifying, to which aspects of the strenghtening of reserch activity must be drawn special role and attention in the missions and strategies of higher education institutions. As well as important aspects are: innovative encouragement of academic staff for active scientific publication creation; support for academic staff for international communication, extensive information on research results; popularisation in mass media on research findings are very important aspects and often not seriously recognised aspects by several universities and higher education administrators.

Keywords: *Indicators, research activity, research organisation, university rankings.*

JEL code: *O30; O32; O38.*

Introduction

Demand of the information about the quality and efficiency of higher education institutions grows, when the market of the higher educatin becomes more open and competitive, when the number of students and the state funding to the higher education decreases and in the influence of other factors (Coates H., 2006). The role of the measuring of the institutional quality of the higher education grows due to interaction of many factors (Stella A., Woodhouse D.,

2006). Affordable way is the strenghtening of the research aspect of the higher education institutions: both international and state financed research, and the participation in the research with local government and industry. Up to now there are not conducted enough such research. There are many academic investigations with practically available suggestions for the facilitating of the research (Padilla-Meléndez A., Garrido-Moreno A., 2012) and for the deeper study of the specific aspect (Chivers G., 2006).

The formation of the ratings of the higher education institutions is the way how to compare organizations for their parameters of activity. The role of the ratings is to offer the information about the quality of services in the form of the measurable distinctions for the sponsors, clients and policy makers (Quality Reserch International, 2016). Admittedly, that ratings are influential. They foster the flow of doctoral students, elite scientists and money of philantrophists to the top institutions in ratings. Ratings determine the reputation of the universities. They attract the interest of the society and change the behaviour of the universities and policy makers (Marginson S., 2007).

In the mean time ratings decrease the expression of innovations in the strategies of universities, in study programmes, in process of study and research, stimulating the leadership of universities to concentrate their energy to the raising of the performance and reputation (especially as for results of resesrch and selection of students) within the framework of the parameters of ratings (Higher Education and Research Standing Committee, 2006). There are approved that results of ratings sidetrack attention of the leadership of higher education institutions from students and true mission and objectives of the higher education creating the undesirable competition between institutions.

As it is highlighted in the "IREG Guidelines for Stakeholders of Academic Rankings" (www.ireg-observatory.org; 2017), while academic rankings provide information about quality and performance and serve to promote transparency of information about higher education, they do not provide causal analysis of differences in performance among the systems, higher education institutions and their activity. Different rankings have different purposes, target different groups, select different indicators, and use different methodologies.

The quality of universities could not be measured promptly only with numbers therefore any rating is controversial and is not absolutely objective (Liu N.C., Cheng Y., 2005). It is not impossible to range the universities worldwide because they are very various in different countries. There are technical problems with the obtaining of the internationally comparable data, with the description of organization names, with the arising and dividing of institutions, with the searching of publications and definition of authors.

There are methodological problems too. The methodology of rankings is relatively new and important field of the study of higher education. The attention must be drawn to the context of the policy of ranking, the character and choice of indicators is very important (Clarke M., 2002).

Indicators are operational variables referring to specific empirically measurable characteristics of higher education institutions or programmes on which evidence can be collected that allows for a determination of whether or not standards are being met. Indicators identify performance trends and signal areas in need of action and enable comparison of actual performance with established objectives (Vlăsceanu L., Grűnberg L., and Pârlea D).

Most indicators developed to date are quantitative giving rise to the criticism that institutions may inadvertently make important what is measurable and perhaps neglect what is important. Although indicators come in many forms, all are descriptive data (for example, percentages, frequencies, means, ratings) triggering important decisions relating to resource allocation, staffing and other matters (Bruwer J., 1998).

There is very important role for research output in analyzing research profiles of higher education institutions – how research production is related to desired outcomes from higher education; is there evidence that research leads to economic gains for states and nations; to what extent is research used by the industry to develop new products and services that can benefit society; are students better in terms of employment as a result of university research?

(Toutkoushian R.K., Webber K., 2011) – these are very important questions in the context of the classification and ratings of higher education institutions.

Similarly, it is very essential to study the way in which research is organized at university, departmental and team levels (Lansley P.R., Luck R., Lupton S., 1995) – considering the level of funding, the type of research projects and the resulting outputs, especially, how these benefit the industry.

W.Siwinski (2016) emphasizes, that the professional literature on quality in higher education shows that international rankings are doing well only in the area of science. This is quite natural and intuitive as results in this area are in the form of publications. By comparing the number of publications and calculating the Hirsch Index, it is possible to compare institutions or faculties in such fields as mathematics, physics, chemistry or others falling into the 'science' group. But another trend is the search for a way to include in the international rankings missions other than research. Especially important here are such important aspects as excellence in teaching and the so-called third mission or the university's social mission.

Taking into account the above mentioned and that, how essential role ratings have in the forming of the reputation of higher education institutions, the aim of the research is to foster the place of higher education institutions in the international ratings with the studies of higher education institutions and especially with analysis of the research indicators. The performance of the leading universities of Baltic states in different international ratings of higher education institutions is compared in the paper analyzing the role of the parameters of the activity of higher education institutions in the forming of the place in ratings.

Methodology of Research

In paper theoretical findings of scientific publications are analysed. For empirical part there are analysed results in different international higher education institution rating systems of leading universities in Baltic states including *QS World University Rankings (QS)*, *The Times Higher World University Ranking (THES)*, *Academic Ranking of World Universities* (ARWU or Shanghai Ranking). The methodologies of ratings and used indicators of the evaluation of research of universities are compared.

Research Results and Discussion

Analyzing the publicly available data of more popular international ratings of higher education institutions, there were revealed, that leading universities of Baltic states are represented both in *QS*, *THES* and *ARWU*. However, their representation and taken places show relevant distinctions in the performance of these universities.

1) ***QS World University Rankings (QS)*** *(Source: http://www.topuniversities.com/qs-world-university-rankings)*

Since the QS World University Rankings were first developed in 2004, they have expanded to rank more than 900 universities in 2016, with over 3,800 assessed. The top 400 universities are given individual ranking positions, and the rest are ranked in groups – starting from 401-410, up to 701+. Based on 6 performance indicators, the ranking assesses university performance across four areas: research, teaching, employability and internationalization: academic reputation (40%), employer reputation (10%), student-to-faculty ratio (20%), citations per faculty (20%), international faculty ratio (5%) and international student ratio (5%).

Table 1

Performance of Baltic universities in *QS* ranking, 2016

University	Rank	TOTAL	Academic reputation	Employer reputation	Student-to-faculty ratio	Citations per faculty	Interna-tional faculty ratio	Interna-tional student ratio
University of Tartu (EE)	=347	33.6	28.7	-	72.9	-	17.4	-
Vilnius University (LT)	481-490	-	-	34.9	58.9	-	-	-
Tallin University of Technology (EE)	601-650	-	-	32.9	33.2	-	22.1	26.5
University of Latvia (LV)	651-700	-	-	-	36.4	-	-	-
Kaunas University of Technology (LT)	701+	-	-	-	37	-	-	-
Vilnius Gediminas Technical university (LT)	701+	-	-	-	29.7	-	-	23.2
Vytautas Magnus university (LT)	701+	-	-	-	-	-	21	-

Source: http://www.topuniversities.com/qs-world-university-rankings

Seven universities of Baltic states are represented in *QS* rating and the University of Tartu (Estonia) is in the highest place (No. 347), achieving this by very highly assessed reserch activity (close to 3,000 research articles published annually and 100 doctoral degrees conferred each year. According to the ISI Web of Science, University of Tartu belongs to the top 1% of the world's most-cited universities and research institutions in 10 fields). Vilnius University (Lithuania) follows with place No. 481-490 and highly assessed research activity. Other Baltic universities take places above position No. 601 in this rating.

2) The Times Higher World University Ranking (THES) *(Source: (https://www.timeshighereducation.com/world-university-rankings)*

The *Times Higher Education (THES)* World University Rankings 2016-2017 list the 980 top universities in the world, making it the biggest international league table to date. It is global university performance table to judge world class universities across all of their core missions – teaching, research, knowledge transfer and international outlook. *THES* ranking uses 13 carefully calibrated performance indicators. Ranking of 2016-2017, which includes institutions from 79 countries, represents 5 per cent of the world's higher education institutions.

Table 2

Indicators of THES Ranking

Field	Indicator	Ratio (%)
1. Teaching (the learning environment)		30
	Reputation survey	15
	Staff-to-student ratio	4.5
	Doctorate-to-bachelor's ratio	2.25
	Doctorates-awarded- to-academic-staff ratio	6
	Institutional income	2.25
2. Research (volume, income and reputation)		30
	Reputation survey	18
	Research income	6
	Research productivity	6
3. Citations (research influence)		30
4. International outlook (staff, students and research		7.5
	International-to-domestic-student ratio	2.5
	International-to-domestic-staff ratio	2.5
	International collaboration	2.5
5. Industry income (knowledge transfer)		2.5
	TOTAL	100

Source: http://www.topuniversities.com/qs-world-university-rankings)

Table 3

Performance of Baltic universities in *THES* ranking, 2016-2017

European rank	World rank	University	Country
=147	301-350	University of Tartu	Estonia
=291	601-800	Tallin University of Technology	Estonia
=291	601-800	Vilnius University	Lithuania
=354	801+	Kaunas University of Technology	Lithuania
=354	801+	Riga Technical University	Latvia
=354	801+	University of Latvia	Latvia

Source: http://www.topuniversities.com/qs-world-university-rankings)

Only six Baltic universities are represented in *THES* rating and the highest position again takes University of Tartu. Tallinn University of Technology (Estonia) and Vilnius University (Lithuania) are in the position No. 601-800.

3) Academic Ranking of World Universities (ARWU or Shanghai Ranking) *(Source: http://www.shanghairanking.com)*

The Academic Ranking of World Universities (ARWU) was first published in 2003 by the Center for World-Class Universities of Shanghai Jiao Tong University, China, and updated on an annual basis. ARWU uses 6 objective indicators to rank world universities, including the number of alumni and staff winning Nobel Prizes and Fields Medals, number of highly cited researchers selected by Thomson Reuters, number of articles published in journals of Nature and Science, number of articles indexed in Science Citation Index, and per capita performance of a university. More than 1200 universities are actually ranked by ARWU every year and the best 500 are published.

Table 4

Indicators and weights for ARWU

Criteria	Indicator	Code	Weight (%)
Quality of Education	Alumni of an institution winning Nobel Prizes and Fields Medals	Alumni	10
Quality of Faculty	Staff of an institution winning Nobel Prizes and Fields Medals	Award	20
	Highly cited researchers in 21 broad subject categories	HiCi	20
Research Output	Papers published in Nature and Science	N&S	20
	Papers indexed in Science Citation Index-expanded and Social Science Citation Index	SCI	20
Per Capita Performance	Per capita academic performance of an institution	Size	10
Total			100

Source: http://www.shanghairanking.com

Table 5

Performance of Baltic universities in ARWU ranking, 2016

World rank	University	National rank	Total score	Score of alumni
401 - 500	University of Tartu (Estonia)	1	-	0.0

Source: http://www.shanghairanking.com

While in the *ARWU* rating from Baltic states is represented only University of Tartu which takes position No. 401-500 in the prestige rating.

Conclusions, Proposals, Recommendations

The results of study revel that different methodologies are used in the international ratings of higher education institutions, but none of world popular approaches and methodologies of the evaluation and comparing of higher education institutions are absolutely objective. However the evaluation of the reserh activity has significant proportion in all of them.

Different indicators of reserch activity are used, but more significant are the number of publications in respectable journals, the number of publications per academic staff, the number of publications in citation data bases, index of citations, number of highly cited researchers, number of doctoral degrees conferred, income from research, productivity of research and income from industry (transfer of knowledge and technology) etc.

Similarly, the reputation of the higher education institution in the international research area has great sense and the results are obtained from the questionnaires of leading academics. Different international awards for important contribution in research play significant role in ratings.

Acquired findings indicate, that the results of research activity of universities have important role in the international ratings of higher education institutions and the improvement of these results facilitates the place of higher education institution in the ratings, thus fortifying, to which aspects of the strenghtening of reserch activity must be drawn special role and attention in the missions and strategies of higher education institutions.

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DESIGN OF TERRITORIES AND MANAGEMENT STRUCTURES IN REGIONAL AND RURAL DEVELOPMENT

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Abstract. Within European Rural Policy the so called LEADER approach encourages rural actors to define a common territory, establish a private-public partnership and take over the responsibility of local development. The development process is supported by a decentralised local management unit. In the initial phase the founders of a local partnership have to make two important decisions. First, they have to lay down the delineations of their territory. Here they can either draw on pre-existing spatial entities or define a new territory from scratch. Second, they have to design operational structures. In practice the management unit can be either LEADER-focused dealing mainly with programme-related issues, or conceptualised as a multi-issue and multi-fund development agency. The design of territories as well as of management structures are supposed to have an impact on the partnerships' operational effectiveness. The purpose of this study was to determine whether there is a significant difference between the two basic management models. It also determined whether a relationship exists between the spatial congruence and the effectiveness of management. The empirical investigations follow an explanatory sequential mixed methods procedure. The quantitative analysis is based on the midterm evaluation of LEADER implementation in Austria in 2007-2013. The qualitative part is built on expert interviews. Statistical testing revealed that spatial congruence and management model excel their impact through the latent variable "institutional thickness". Local partnerships covering a territory with a higher spatial matching and running a one-stop-shop-like development agency had least difficulties to set up an effective management. The expert interviews confirmed these results but stressed the fact that governance regimes with a high institutional thickness must remain open for new actors and new ideas.

Key words: *regional development, rural development, LEADER, decentralised management structures*

JEL code: R58 Regional Development Planning and Policy

Introduction

In the scope of European Rural Policy the so called LEADER approach encourages rural actors to define a common territory, establish a private-public partnership, the Local Action Group (LAG), and take over the responsibility of local development. In a participative process the LAG elaborates a local development strategy which is to be implemented by projects supported by the European Agriculture Fund for Rural Development (EAFRD) complemented by national or regional funds of the Member States. Two structural elements are obligatory and crucial for the functioning of a LAG, first, a decision-making body which selects projects to be supported by LEADER funding, and second an operating unit, the LAG management. This study focuses on the LAG management which has an important support function regarding the animation of actors, project development and funding procedures. In the initial phase the founders of a LAG have to make two important decisions which are supposed to have an impact on the effectiveness of management. First, they have to lay down the delineations of their territory. Here they can draw on pre-existing spatial entities such as administrative districts or tourism destinations, or they can define a territory from scratch. Second they have to design the operating structures of the LAG management. This unit can be either LEADER-focused dealing mainly with programme-related issues, or conceptualised as a multi-issue and multi-fund development agency (one-stop-shop model). The literature

provides no clear suggestions regarding the most appropriate design of territories as well as of management structures in regional and rural development. It is somehow surprising that in official programme evaluations as well as in independent empirical research factors influencing the effectiveness of management received very little attention. In the scope of the midterm evaluation of LEADER implementation in Austria in the 2007-2013-period for instance LAG managers were asked to which extent an effective management could be set up (Dax et al. 2011). However, the evaluation did not answer why some LAGs had more difficulties in doing so than others. Also other official programme evaluations are specific only on descriptive statistics (IfLS 2016) and hence leave a knowledge gap regarding causal relationships. A better knowledge on institutional factors and their impact on decentralised management in territorial development should help local actors and programme authorities to make the right decisions from the outset. The findings of the study shall particularly facilitate a more effective preparing for the coming programme period 2021-2027. Filling this gap in the knowledge base is highly relevant simply due to a substantial EU budget of several billion Euro going into LEADER (e.g. 6.7 billion Euro in 2014-2020) on the one side and rather sobering appraisals of the method's effectiveness on the other (e.g. ECA 2010). The purpose of this study was to determine whether there is a significant difference between the two management models *LEADER-focused* and *one-stop-shop* on their effectiveness. It also determined whether a relationship exists between the matching of LEADER territories with other spatial entities and the effectiveness of LAG managements. The variable "effectiveness" was measured by the responses received from Austrian LAG managers in the scope of the midterm evaluation of LEADER implementation in the 2007-2013-period. The null hypotheses state that there is neither a difference between the two management models nor a relationship between spatial congruence and the effectiveness of LAG managements. The empirical investigations followed an explanatory sequential mixed methods procedure based on a quantitative and a qualitative part. The quantitative analysis was based on the midterm evaluation of LEADER implementation in Austria. The qualitative part consisted of face-to-face expert interviews helping to interpret the quantitative results and to transfer them from the narrow world of LEADER in Austria to a more general context.

Literature Review

The literature review at first builds on a description of LEADER and its evolution over more than 25 years. LEADER represents best an ideal type of bottom-up driven endogenous rural development and ultimately a genuine form of local self-organisation but not without a strong element of external guidance via a superior policy framework and public funding provisions (Heintel 2005, p. 42). In 1991 the European Commission introduced LEADER as a Community Initiative (CI). In the EU12 altogether 217 LAGs were selected directly by the European Commission. These LAGs were seen as true laboratories to find new solutions in rural areas through endogenous development. In the following period 1994-1999 LEADER was expanded to more than 900 LAGs. The financial volume increased up to 1.7 billion ECU of EU funding. Under the CI LEADER 2 the operational programmes were not anymore directly launched by the European Commission but by the Member States. In the following period 2000-2006 the CI LEADER+ underwent again an up-grading supported by a reform of the Common Agricultural Policy (CAP) which brought about a shift from a sectoral towards a more comprehensive rural development policy and a strengthening of the territorial dimension. The financial EU contribution for LEADER+ added up to 2.1 billion Euro and was, differently from the previous periods, only endowed with the European Agricultural Guidance and Guarantee Fund. Whereas in the first two programme periods LEADER had a focus on disadvantaged rural areas (objective 5b and objective 1) areas in LEADER+ the instrument was targeted to the whole rural Europe. 893 LAGs where selected in the EU15. About another 250 partnerships were installed through LEADER-type measures in six accession countries which joined the EU in 2004 (EC 2012). After three programme periods the instrument has reached a level of maturity enabling rural areas for wider implementation of the LEADER approach. In the scope of the CAP reform for the 2007-2013-period LEADER got formally integrated into mainstream Rural

Development Programmes (RDP) conceived as a horizontal priority scheme. This so called "mainstreaming" was supported by a study on potential benefits of including the LEADER approach which concludes that it is not restricted to a small experimental niche but applicable to the whole spectrum of rural development measures (ÖIR 2004). In the 2007-2013-period LEADER was implemented in 27 Member States and 2,402 LAGs. LEADER territories covered 77% of the EU territory. The EU funding for LEADER amounted 5.5 billion Euro which was about 6% of the entire EAFRD budget. For the 2014-2020-period the European Commission proposed to create a new multi-fund mechanism now again involving also the European Regional Development Fund and the European Social Fund. Growing out of its rural origin the LEADER approach got a new name: Community Lead Local Development (CLLD). In the current period LEADER is implemented in about 2,600 LAGs and another 5000 fishery LAGs all across Europe. The broad recognition of this approach finds expression in Article 31 of Regulation (EC) No. 1305/2013 according to which "*The LEADER approach for local development has, over a number of years, proven its effectiveness in promoting the development of rural areas by fully taking into account the multi-sectoral needs for endogenous rural development through its bottom-up approach. LEADER should therefore be continued in the future and its application should remain compulsory for rural development programmes at national and/or regional level.*" Several evaluation studies throughout all programme periods and countries suggest that LEADER has a considerable positive impact on the development of rural regions even though the budget is rather restricted compared to mainstream interventions (ESPON Monitoring Committee 2004; ÖIR 2006). On the occasion of an ELARD conference held on 22-23 November 2016 in Tartu, Estonia, 140 delegates from 25 European countries representing about 2,000 LAGs, rural networks, managing authorities and the European Commission critically reflected 25 years of LEADER implementation and came to the conclusion that this specific approach for regional and rural development is more important than ever. However, in their so called Tartu declaration the conference participants also recognised that there is room for improvements (ELARD 2016). This, however, is not a new insight. Already in 2010 the European Court of Auditors came to the conclusion that LEADER promoted integrated development only to a limited extent (ECA 2010). In fact, local self-organisation in territorial development does not automatically emerge. In contrast, it is the result of a demanding management. The crucial role of decentralised management is highlighted in several studies (ESPON Monitoring Committee 2004, p. 181; ÖIR 2006; ECA 2010; Mose I. et al. 2013; Lukesch R., 2007). However, the actual role of LAG managements varies from Member State to Member State and even from region to region. In some countries LAG managements have developed into local development agencies with a wide range of tasks and functions (Lukesch R., 2007). They make use of several development programmes and are not corseted to implement rural policy. In other countries LAGs are primarily seen as an important implementation structure of rural policy. Some have more and other less flexibility to use other programmes or deliver other services outside rural development. Another model describes LAGs as a merely temporary phenomenon resulting from local initiatives linked with an opportunistic exploitation of funding opportunities. However, Lukesch observes a general trend towards long-term, multi-purpose structures not least due to an ineffectiveness of setting up new institutions from scratch for just one programming period. In the 2014-2020-period the European Commission explicitly encouraged the Member States to follow a multi-fund strategy and to upgrade LAGs towards more comprehensive development agencies with a wide range of tasks and functions (ELARD 2017). Also the evaluation of LEADER implementation in the German *Bundesland* Baden-Württemberg concludes that it instrument could become more effective through using other European funds following the one-territory-one-strategy principle of multi-sectoral development (IfLS 2016, p. 28). However, the establishment of LAGs does not take place in an institutional vacuum. Other operational programmes financed by European Regional Development Fund or national funds support similar decentralised structures such as regional managements or "Euregio" managements in the context cross-border regional development. LAG managements and regional managements often exist in parallel, cover overlapping territories and operate in a more or less coordinated way. Their parallel existence

results from their different political embedding, the one is an instrument of rural the other of regional policy. The long tradition of these development instruments in the various countries has even strengthened their separate position. However, in reality this differentiation very often vanishes. Austria and Germany are two countries where the interplay of these two structural models can be well exemplified. In some provinces they are united into one organisational unit (one-stop-shop model), in others they exist in parallel (Dax T. et al. 2016). However, unclear or overlapping responsibilities and structures are often a persisting problem (Dax T. & Oedl-Wieser T., 2016; Suske W. & Huber J., 2013; Zankl C., 2012, p. 102). In the 2007-2013-period two thirds of the Austrian LAGs were completely independent from regional managements. A third of them reported about cooperation difficulties and even conflicts resulting from competitive positions and the lack of overall strategies (Suske W. and Huber J., 2013, p.39ff). In territories where both institutions operate in parallel regional managements are often considered as more top-down driven and having a much less local anchoring. They cover larger territories and operate more on the grounds of superior development strategies. LAGs in contrast are seen as the true bottom-up actors. Referring to these two lines, LAG management and regional management, Suske and Huber advised against an extension of LAG managements into development agencies due to potential confusions of competences (Suske W. and Huber J. 2013, p. 38). LAG managers would also rather refuse a merging with regional managements in particular when it goes on the expense of proximity to project promotors. However, their reservations might also be explained by a potential loss of their jobs. All in all, the literature provides arguments for both, one-stop-shop and LEADER-focused managements. A similar ambiguity is true for the shaping of territories. According to Article 62(3) of Council Regulation (EC) No. 1698/2005 LEADER territories shall be coherent from a geographical, economic and social point of view. They must also "*offer sufficient critical mass in terms of human, financial and economic resources to support a viable development strategy*". For the programme period 2014-2010 Regulation (EU) No. 1303/2013 article 33 (6) specifies the limits for the population of an area which shall be not less than 10,000 and not more than 150,000 inhabitants. The European Commission guide for the application of the LEADER axis suggests to defining the precise boundaries of the territory depending upon "*who wants to do what with whom*" (EC 2011). Anyhow, the guidelines and regulations for eligible territories have so far allowed a wide leeway for rural partnerships to make use of LEADER. And indeed, the vast majority of LAGs reported that they had a high degree of autonomy in defining their territory's delineations (ENRD 2012, p.10). In Germany for instance most LAG managers classified their territory as adequately defined even though a huge variety in population and shaping could be observed (Pollermann K. et al. 2013). Also in Austria in the 2007-2013-period almost all managers were quite happy with the design of their territories (Dax T. et al. 2011). Nevertheless also in Austria the variety was rather great. LEADER territories are in principle new bottom-up defined spatial entities which do not necessarily correspond to already existing ones. Their delineations are inspired by the natural, administrative, economic, social and/or historical situation. Some of them are defined from scratch others are founded on pre-existing structures. Some are named after well-known, historically-anchored local units. Others get new artificial names with at first little reference for a common local belonging. Anyway, local self-organisation should unfold much easier when local actors have a common perception of a territory (Benz A. & Fürst D., 2003, p. 199f). Such a common perception in turn is more likely where several institutions refer to the same spatial scope of acting. Overlapping governance structures and manifold linkages of actors condense social capital as a source of network formation. At best political-administrative entities match with other functional structures of territorial perception and identification as well as social and economic interaction. Such structures should allow a better institutionalisation and coordination of management, marketing and development activities. Quinn largely supports this argument but stresses more the importance of functionality which should be the key to define territories. Functionality determines the coherence of a territory and in further consequence the success or failure of policy initiatives. Territories showing little economic, cultural, or political cohesion have difficulties to build governance networks and attract the involvement of actors (Quinn M., 2015). The establishment of

governance-regimes becomes in any case difficult when existing structures of administration and coordination do not match with actual or potential functional entities. Based on an evaluation of management structures in the Austrian *Bundesland* Tyrol Hummelbrunner proposed to set-up territorial development units on the spatial grounds of administrative districts (Hummelbrunner R., 2005). In reality the process of territory-building is largely determined by economic rationalities, logics of inter-municipal cooperation and constraints of subsidy policies (Balke J. & Reimer M., 2016). Hence, a spatial matching of LEADER territories with other entities may allow more easily to connect with existing institutions and to achieve a higher effectiveness. On the other side, the chance to set up completely new spatial entities independently from pre-existing administrative units would allow to break up existing numbness (Hahne U., 2002). Referring to the definition of LEADER territories in Germany Schroedter criticized a dogmatic holding on *Landkreis* boundaries (Schroedter E., 2009, p. 91). In the German *Bundesland* Baden-Württemberg, anyhow, programme authorities explicitly digressed from this practice. In the 2014-2020-period LEADER territories in Baden-Württemberg must not be congruent with political-administrative units.

Research Results and Discussion

The empirical investigations follow an explanatory sequential mixed methods procedure based on a quantitative and a qualitative part. The quantitative analysis is based on the midterm evaluation of LEADER implementation in Austria in the period 2007-2013 conducted in 2010 (Dax T. et al., 2010). In the respective period LEADER in Austria was implemented by 86 LAGs. The evaluation also comprised a survey with LAG managers based on an online-questionnaire. 73 of the Austrian LAG managers completed the questionnaire. 63 agreed on the usage of the data for this study which resulted in a response rate of 73%. In official programme evaluations key stakeholders feel somehow obliged to participate in respective surveys. For a researcher's own investigations a much lower response rate of about 5-10% can be expected. Hence, using this data base for further inferential statistics was a unique opportunity. The limitations of that data source concern first their topicality and second their structure. For this study the data have already been seven years old. However, more recent data are not available. Even though the new programme period 2014-2020 has entailed some technical modifications the basic framework conditions for LAGs have remained pretty the same. The survey data are of ordinal nature. This concerns also the central dependent variable of this study, the effectiveness of management. The qualitative part is built on face-to-face expert interviews helping to interpret the quantitative results and to transfer them from the narrow world of LEADER in Austria to a more general context. The interviews were conducted from September 2016 to January 2017. Altogether 16 experts in Austria, Germany and Switzerland got interviewed. These experts have been consultants and/or researchers in regional/local development and management. At first the results of the quantitative part are outlined. In the scope of the midterm evaluation LAG managers were asked to describe to which extent an effectively operating management could be set up under the given framework conditions. The provided answers to be ticked comprised only three categories: very well achieved, in general achieved, partly achieved. These options did not include a negative extreme of a completely malfunctioning management. 57.1% (36) of the respondents chose the best and 39.7% (25) the middle option. For only two (3.2%) an effective management could only partly realized. The all in all rather positive replies let not assume that anyone would have chosen a negative extreme. Anyway, self-assessments might always include a bias of "rose glasses". This is particularly true when the own performance is placed in the shop window. In regard to spatial designs LAG managers were asked about the matching of their territory with districts, tourism destinations or inter-communal spatial planning units. Based on these three categories a matching scale was designed. If a LEADER territory was congruent with all of the three other categories it got assigned the value 4 (high matching). This was the case for eight LAGs (12.7%). 31.7% (20 LAGs) showed a matching with two other entities (moderate matching) which was coded with the value 3. For 25.4% (16 LAGs) the matching was low (congruent with only one other entity,

matching value 2). 30.2% (19 LAGs) had no spatial congruence (matching value 1). A first Spearman's-rho test indicated a weak but significant positive relationship between spatial matching and the effectiveness of management (n 63, r 0.275, sign. 0.029). The higher the congruence the more likely was it to set up an effective management. In order to determine whether there is a significant difference between the two structural models *LEADER-focused* and *one-stop-shop* on the operative effectiveness all LAGs were assigned to one or the other group based on the respective information given by the LAG managers. A non-parametric Mann-Whitney-U showed that the two groups significantly differ from each other (sign. 0.005). For LAGs with a one-stop-shop model it was more likely to set up an effective management. Both independent variables seemed to have some explanatory power for the effectiveness of LAG managements. The null hypotheses could be rejected. However, LEADER territories with a one-stop-shop management model showed also a higher spatial matching with other entities. A Mann-Whitney-U test revealed a highly significant relationship between the two variables (sign. 0.004). So, the impact of one of the two independent variables on the effectiveness of management could be spurious. In order to test if the one independent variable is in fact explained by the other the statistical testing was repeated for pre-selected groups. First, the influence of spatial matching on the effectiveness of management was tested for the group of LAGs with a LEADER-focused management. For this group the correlation became very weak and fell below the level of significance (n 47, r 0.157, sign. 0.209). Second, the difference between the two management models was tested for the pre-selected group of LAGs with a high or moderate spatial matching. Also for this group the relationship was not significant anymore (n 28, sign. 0.226). These findings suggest that the two independent variables exert their influence in combination through a superior factor. Spatial congruence and the design of management structures can be seen as two elements of institutional thickness. The concept of institutional thickness describes key features of local governance of economic development (Heintel M., 2005; Coulson A., & Ferrario C., 2007). A high institutional thickness describes a dense network of socio-institutional relationships and structures. LAGs with a one-stop-shop management model covering a territory with a high or moderate matching with other spatial entities are supposed to have a higher institutional thickness than those with a LEADER-focused management and a territory with no or low spatial congruence. A combining of the two variables results in four groups (see Fig. 1).

		Congruence of LEADER territory with other spatial entities	
		No/low matching	*Moderate/high matching*
Management model	*LEADER-focused*	29	18
	one-stop-shop	6	10

Source: author's construction based on data from the midterm evaluation of LEADER implementation in Austria 2007-2013

Fig. 1. **Grouping of Austrian LAGs based on management model and spatial congruence**

It was analysed if these four groups differ in regard to setting up an effective management. Due to the coding of answers (1: highly achieved; 2: in general achieved; 3: partly achieved) low mean ranks stand for higher effectiveness. The combination of one-stop-shop model with a moderate to high spatial matching showed the lowest mean rank. For

this group it was most easily to set up an effective management (see Table 1). The second lowest mean rank came for the combination of one-stop-shop model with no or low spatial matching. With a clear distance the combination of LEADER-focused management and moderate to high spatial matching came on third place. For the group with a LEADER-focused management and no to low spatial matching it seemed to be most difficult to achieve effectiveness. This sequence suggests that the variable management model has a stronger impact then spatial congruence.

Table 1

Mean ranks of effective management for the four groups of LAGs

	Institutional thickness	N	Mean Rank
Effective management	*LEADER-focused* and *no/low matching*	29	**38.36**
	LEADER-focused and *moderate/high matching*	18	**30.36**
	One-stop-shop and *no/low matching*	6	**23.58**
	One-stop-shop and *moderate/high matching*	10	**21.55**

Source: author's calculations based on data from the midterm evaluation of LEADER implementation in Austria 2007-2013

A Kruskal-Wallis test revealed that the differences between the groups are significant (see Table 2).

Table 2

Kruskal Wallis test for institutional thickness and effective management

	Rank effective management
Chi-square	10.854
Df	3
Asymp. sign. (2-tailed)	0.013

Group variable: institutional thickness

Source: author's calculations based on data from the midterm evaluation of LEADER implementation in Austria 2007-2013

In order to interpret these results and to transfer them from the narrow world of LEADER in Austria to a more general context the quantitative analysis was completed by qualitative expert interviews. The expert interviews showed that the variety of territorial designs and management structures observed in Austria can also be found in Germany and Switzerland. In the wide field of territorial development in the last decades several new spatial entities emerged such as nature or biosphere parks, New Regional Policy Areas (Switzerland), LEADER territories (EU countries), regional innovation areas, metropolitan areas, etc. All of these entities are more or less dedicated to an integrated, cross-sector development approach. However, their origin has often been sector-based and hence respective support programmes are administered by different authorities. Several experts reported about frequent departmental thinking and little ambitions for a real coordinated implementation of development instruments. The programmatic claim of "integrated" appeared as little more than lip service. Not surprisingly a high spatial matching seems to be rather the exception than the rule even though it is more frequent in mountainous areas then in lowlands. A mountainous topography much clearer pre-determines functionality of territories. Historical and cultural stories of an area can be a strong anchor for people's belonging which in turn keeps local actors from outmigration and motivates them to become engaged in the economic development of their area. However, historically grown patterns may be not appropriate anymore due to an increased mobility and separation of housing and working. The importance of territorial identities was appraised differently. For some experts this factor is key for defining boundaries others were rather sceptical. The latter argued that a focus on identity would entice sticking to historically-determined delineations which are often not functional anymore. In principle the variety of spatial shaping results from different rationales of territory-based issues. Although administrative boundaries not necessarily fit to functional logics of economic development, a matching of territories with administrative units and/or NUTS regions (nomenclature des unités territoriales statistiques/classification of territorial units for statistics), in particular NUTS 3,

makes it much easier to plan and monitor economic development on the basis of quantified macro-economic and socio-demographic indicators. For completely new delineations in contrast statistical data are hardly available. The formation of new territories for economic development often starts from municipalities as their basic spatial units. It's then up to local politicians, in particular mayors, to represent their municipalities in territory-based decision making bodies. A great variety of territorial shaping and hence constellations of decision-making go along with higher complexity. Under such conditions mayors usually argue for compact and compelling structures. Hence, a high spatial matching was often considered as an expression of efficiency. The possibility of docking on existing structures would offer promising starting positions. Historically grown compact structures imply an already existing dense fabric of interactions (institutional thickness). Strong traditional elites, however, would tend to keep development programmes a closed shop. Then, a bottom-up formation of new territories literally from scratch was often considered as an emancipatory action to prevent dominant actors to seize project financing instruments. In reality often two extremes can be observed. On the one side new territories are arbitrarily put together of remaining municipalities not yet part of formerly established LAGs. On the other side established LEADER territories are built on traditional and often too rigid structures. Neither the one nor the other is seen as an ideal solution. Over all expert interviews the importance of functionality turned out to be the central common denominator. If tourism is a prominent strategic issue in rural development a LEADER territory should cover respective tourism destinations. Therefore local development and tourism development could refer to one coherent territory-based strategy. Functionality also implies the question of which issues can be tackled at which territorial scale. Development strategies tackle in general several issues with differing spatial references. Moreover, territorial settings are often fuzzy. The true art would lie in finding the right spatial umbrella for a consistent and integrated development strategy. A high congruence of various spatial entities could come very close to such an umbrella. The discussion about functionality leads straight to the question of appropriate management structures. Some experts considered a functional division of LAG managements and regional management reasonable and qualified the resulting diversity as enrichment. Bottom-up development initiatives would need a close daily contact to the people which can only be guaranteed by small, decentralised structures. Development on a larger scale, however, should be in the hands of key stakeholders of the political-administrative system, the financial sector, private companies, research and development institutions, etc. Other experts criticised such parallel structures because they would often result in understaffed small management units with little effectiveness. In Austria for instance LAG managements do in general not have more than one to two employees. The situation in many other European countries is very similar (ENRD 2010, p. 14). LEADER was originally conceptualized as a laboratory for rural development. And still, the resources dedicated to LAGs would allow not more than fiddling about with some local projects. Visible development progress, however, wood need more resources, more momentum and more involvement of local and regional decision makers. A duality of micro-regional managements and LAG managements would also contradict or at least make it more difficult to realise a modern development approach based on well-coordinated and effectively interacting top-down and bottom-up activities. Hence, setting up one-stop-shop management units which work with all available funds and pursue a more holistic development approach seem to be more effective. A coordinated employment of various funds could also allow better staffed management units. On the other side, one-stop-shop management structures would hold the risk of closed shops controlled by traditional elites who tend to share funds between them. A variety of structures in contrast would help to keep the doors open for new actors and new ideas and so would increase the resilience of an area. Anyway, programme specific rules have become very restrictive for mixing financial instruments within one organisation. In fact the European financial control system seems to have seized the implementation of funds. An exact obeying to excessive rules for even small expenditures would weight more than the achievement of development objectives. So, fund-specific micro-regional and local implementation structures would be very much forced into a sectoral policy corset. A comparison of implementation practice in the two German

regions Bavaria and Baden-Württemberg help to put the debate about institutional thickness in a nutshell. In Bavaria the majority of LAGs are set up based on *Landkreis* (administrative districts) boundaries. And very often the *Landrat*, the elected head of administration, is the dominant actor and management units are directly docked on the *Landrat* office. In the best case power promotors (top down) and innovators (bottom-up) fruitfully interact. It comes to a sound balance between broad involvement of local communities and a more elitist decision-making in the implementation phase (Scherer R., 2006, p. 247). The system keeps open for new actors and new ideas. However, in order to achieve such a favourable constellation *Landkreise* must not be too large. Otherwise these territories would be too heterogenous and it would become rather difficult to identify common issues. If a *Landkreis* has been the result of a top-down forced merging of smaller units it would rather not a fruitful ground for e.g. a LEADER territory. Programme authorities in Baden-Württemberg however followed a completely different approach. In order to avoid the domination of the head of administration and to unbreak too rigid structures LEADER territories must explicitly not be congruent with *Landkreise* in the programme period 2014-2020. Here, they are designed in a cross-district manner. LAGs get the chance to emancipate from traditional elites and realise a true bottom-up approach. The question remains if such initiatives will gain enough momentum for a real sustainable and visible development. Further research will show which model is more effective depending on the constellations of actors, their perceptions and interests. All in all, independently from their provenience all experts largely confirmed a positive impact of spatial matching as well as of one-stop-shop models on the effectiveness of management even though rather seldom with an absolute "yes" but more often with a "yes but". However, due to different framework conditions it's rather unrealistic to propose a one-fits-all-model.

Conclusions, proposals, recommendations

From analysing the impact of spatial congruence and the two management models *LEADER-focused* and *one-stop-shop* on the effectiveness of LAG managements the following conclusions can be drawn:

- The actual role of LAG managements varies from Member State to Member State and even from region to region. In some countries LAG managements have developed into local development agencies with a wide range of tasks and functions. They make use of several development programmes and are not corseted to implement rural policy (one-stop-shop). In other countries LAGs are primarily seen as an important implementation structure of rural policy (LEADER-focused).
- LEADER territories do not necessarily correspond to already existing spatial entities. Local self-organisation in regional and rural development should unfold much easier when local actors have a common territorial perception. This is more likely if several institutions refer to the same spatial scope of acting. At best political-administrative entities match with other functional structures of territorial identification as well as social and economic interaction.
- Statistical testing for Austrian LAGs at first revealed that one-stop-shop models as well as a higher matching of LEADER territories with other spatial entities have a positive impact on the effectiveness of management. However, Austrian LEADER territories with a one-stop-shop management show also a higher congruence with other entities. The impact of spatial matching diminished for LAGs with a LEADER-focused management and vice versa.
- The findings suggest that these two independent variables exert their influence in combination through the latent variable institutional thickness. A higher matching of LEADER territories with other spatial entities in combination with a one-stop-shop management correspond to a higher institutional thickness.

- Further statistical testing confirmed that LAGs with a high institutional thickness could most likely set up an effective management. On the other end of the scale stand LAGs with a LEADER-focused management and covering a territory with no to little spatial congruence. These LAGs had more difficulties with setting up an effective management.
- The impact on effectiveness seems to be stronger for the management model than for spatial congruence.
- Experts from Austria, Germany and Switzerland largely confirm a positive impact of spatial matching as well as of one-stop-shop models on the effectiveness of management even though rather seldom with an absolute "yes" but more often with a "yes but". Due to different framework conditions proposing a one-fits-all-model would not be reasonable.
- In the best case power promotors (top-down) and innovators (bottom-up) fruitfully interact. It comes to a sound balance between broad involvement of local communities and a more elitist decision making in the implementation phase.

For the design of territories and of management structures the following proposals and recommendations can be made:

- The pre-existing political-administrative entities of *Landkreise* (Germany) or *Bezirke* (Austria) can be a first blueprint to design territories for economic development. But such areas should also correspond to functional entities and must not be too large. Otherwise it would be rather difficult to identify common strategic issues.
- If tourism is a prominent issue in local development strategies LEADER territories should be congruent with tourism destinations. Therefore local development and tourism development should refer to one coherent territory-based strategy.
- Regional and rural development policy must not be seen as competing fields of intervention. Integrated, cross-sector approaches should be mirrored at programme level which in turn allows the setting up of sufficiently staffed one-stop-shop development agencies at micro-regional or local level.
- Entrusting political-administrative leaders with economic development can give micro-regional or local initiatives momentum as long as the system keeps open for new actors (innovators) and new ideas.

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DIGITAL MARKETING AS INNOVATIVE MARKETING TECHNOLOGY

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Abstract. This paper aims to analyse digital marketing as a part of innovative marketing strategy and to find the most successful ways of using it. The authors present the relationship between the innovative marketing and digital marketing and how they affect each other. Some of the most common mistakes of the digital marketing are discussed in this paper. This paper consists of theoretical review of digital marketing's role in innovative marketing strategies, review of digital marketing trends and an empirical research. In the empirical research a survey among 404 citizens of Latvia is conducted to determine the most effective digital marketing approaches. Practical examples of digital marketing implementation as a part of innovative marketing strategy and existing digital marketing solutions that could be used in innovative marketing are discussed. This paper discusses how different ways of using digital marketing may have different effects on the audience, as well that the most expensive tools are not necessarily the most effective.

Key words: *innovative marketing, digital marketing*

JEL code: M31

Introduction

Innovative marketing is comparatively new term. For that reason, implementation of innovative marketing within a company is a complex process as it incorporates a mixture of various technologies in original and improved forms. Omni-channel marketing is the next evolution stage of multi-channel marketing and it is a component of innovative marketing strategy. It can be a challenge for companies to provide seamless experience for consumers as it requires comprehension of the nuances of the technologies that are used and the risks. Digital marketing is one of these technologies and it offers many potentialities. One of the challenges of digital marketing is the inaccurate and ineffective use of it.

The aim of this paper is to analyse digital marketing as a component of innovative marketing to determine the most successful ways of using it.

Research object of this paper is digital marketing communication as component of the innovative marketing communication.

Research objective: through analysis of the digital marketing communications and the marketing environment in Latvia to discover feasible directions to improve the digital marketing communications from the consumer perspective in Latvia.

The following tasks are executed in this paper to reach the aim of the study:

•to identify the relationship between the innovative marketing and digital marketing;

•to review digital marketing's role in innovative marketing strategies;

•to determine practical application of innovative marketing in digital context;

•to evaluate current situation of marketing innovation within Latvia;

•to evaluate consumer satisfaction with current marketing communications;

•to draw conclusions and make recommendations for practical usage of innovative marketing in digital marketing.

Research methods: abstract analysis of literature, internet resources and the survey results.

Research results: clearly outlined problems and possible solutions in order to improve the quality and effectiveness of digital marketing communication in Latvia with focus on innovative marketing communications.

1. Theory

In majority of companies' innovation is the key for the success. Nowadays the environment is constantly changing and it is challenging for the company to plan in longer term, therefore the significance of the innovative approaches is increasing. (Gupta S., Malhotra N. K., Czinkota M, Foroudi P, 2016) The authors of the paper states: either the company is following the changes created by others or it is creating the change itself (Doyle P, Bridgewater S., 1998; Ikujiro N., Hirotaka T., 1995). Innovation is the basis of the creation of wealth and the key factor for the company's competitiveness. Marketing is evolving and new term - innovative marketing - has appeared. Innovation has 4 types: product, process, organisational and marketing innovation (Medrano N. & Olarte-Pascual C., 2016). There are few definitions regarding this term and the understanding of this term is very limited as it is new and has not been researched much (Rostami N.A., 2015). OECD is defining marketing innovation as the implementation of new methods, including relevant changes in the product design or packaging, product placement, product promotion or pricing (Glossary of Statistical Terms, 2005). The authors of this paper simplifies the understanding of this term and explains the innovative marketing as the new approach to traditional marketing elements in such a way that it creates the marketing efficiency. Some theories suggest that high levels of collective knowledge benefit to knowledge creation and has positive impact on marketing innovation. The marketing innovation in some cases improves financial performance of the company implementing it(Julia Nieves, Gonzalo Diaz-Meneses, 2016; Osman G., Sinem P., 2017; Avlonitis GJ., Kouremenos A., Tzokas N., 1994; Bayus B., Erickson G., Jacobson R., 2003; Bowen FE., Rostami M., Steel P, 2010; Brown S., Eisenhardt K., 1995; Cainelli G., Evangelista R., Savona M., 2004; Balkin DB., Markman GD., Gomez-Mejia LR., 2000).

Nowadays the technologies are developing constantly, therefore predicting the future is becoming an impossible thing to do. Digital world is changing constantly, social platforms and sites are developing, changing and gaining an increasing importance in consumers' everyday life. It is impossible to predict which social platforms will be relevant in 5, 10 or 20 years near future (Government Chief Scientific Adviser, 2014). The authors of the paper states that digital environment has changed the types of communication and the ways how people communicate with each other, with companies and brands, how they are searching for the information. The development of the technologies has brought companies and brands closer to the consumers, allowing them to communicate online. Therefore, the companies now have the power and the ability to reply to consumer messages, inform them about the updates in their products, and as well promote the product in much faster, better and personalised way. The internet and the technologies has provided companies with information that they did not have 10 -20 years ago, giving them opportunity to learn consumer preferences considerably faster and more effective. Digital technologies enable companies to adapt their products and their messages more successfully. Many companies provide consumers with the 24/7 support in the internet environment, therefore making internet shopping more popular as it has become more convenient. Consumers have the chance to purchase products or to book services any place and time. They are getting used to the ease of use very fast - if the home page design does not meet their expectations or is too complex to use, they will look for an easier alternative if there is any. But not only has the shopping experience improved with the digital age. Consumers now have the unlimited power to leave their comments, their reviews and their complaints in the digital world - in home pages, social platforms, blogs, video blogs and other platforms. Depending on their influence in the digital world, the impact that these posts have on potential buyers can vary. Therefore, the way how the company is communicating with consumers online as well as the channels it is using is a crucial factor to their competitiveness (Hudson Simon, Roth Martin S., Madden Thomas J., 2012;

Darla Moore School of Business, 2012).

The authors of this paper believe that content is a fuel in creation and maintenance of the relationships with the consumers. It has to be in the optimal amount. Great importance is also to the quality and the channels chosen. The essence of the marketing lies in the distraction - distracting consumers from their tasks, for example, browsing internet, checking news feed, performing some task in order to pay attention to the commercial or the marketing message. This marketing communication therefore must be worth the distraction. And some companies nowadays are going beyond that and making the content more entertaining and relevant for the consumers. This content might not increase the sales, but it can increase the brand awareness and loyalty. In 2015 USA consumers in average saw 4-10 thousand marketing messages yearly, while the number was only ~3.5 thousand in the year 2005. Therefore the amount of the marketing content is increasing, but the amount that the consumer can notice stays the same as they only have 24h hours a day. Therefore the content as well as the visual appearance has significant importance to be noticed by consumers. And that is the reason why innovative approaches to marketing is so important - new unseen ways of using the marketing approaches can be the ones that could actually reach the attention of the consumers - either it is more effective and precisely directed message, or is it a fresh view of the old tools (Red Crow Marketing Inc, 2015; The Statistics Portal, 2017; Pujol N., 2011; Puzakova M., Kwak H., Taylor C.R., 2013).

Social platforms allow for companies to communicate with their clients and to build stronger relationships. The usage of social platforms in marketing activities increases brand awareness and consumer loyalty (Blue Fountain Media, 2017). In USA 81% of the adults actively uses one of the social media platforms (The Statistics Portal, 2017). Social site usage has increasing tendency; therefore, brands and companies should focus to the content and their social image (Pew Research Center "Internet & Technology", 2017).

Blogs and video blogs about a product or a brand requires a response from the company - it can be a comment, a share, or it can be mentioned in some of the companies' social platform pages. There should be a conversation between the brand and the consumer in the internet environment. When consumers are talking about a brand in social sites, they are giving information to the company as well as other consumers therefore this information is crucial for the success of the company. Companies should research and analyse their digital brand image, the opinions consumers have about them as well as types or groups of consumers who like the brand and who does not. Segmentation is a key factor of product distribution and creating successful marketing images. Digital world is providing the company with detailed insight into their consumer minds and preferences – the usage of this information is the key to successful segmentation (Miles C., 2010; Machiel J. R., Marija B., Lluis G., Athanasios K., 2016; Longfield K. Moorsmith R., Peterson K., Fortin I., Ayers J., 2016).

Using databases combined with the information about the consumers as well as the information in the internet, the company can have successful brand positioning strategy, reaching the right audiences at the right time. The internet and digital world itself will be the first to signalize which of these strategies are successful and which should be improved. Nowadays more than ever the internet users are sending information to the companies about their preferences and opinions of the products or brands. (Sivinski B., Dabrowski D., 2016; Grabowski P., Samfelt J., 2016; Chen, H., Chiang, R and Storey, V., 2012; Chessell, M., 2014; Lewis, K., Kaufman, J., Gonzalez, M., Wimmer, A., & Christakis, N., 2008; McAfee, A. and Brynjolfsson, E., 2012; de Montjoye, Y. A., Hidalgo, C. A., Verleysen, M., & Blondel, V. D., 2013; Moody, D. and Walsh, P., 1999; Swan, M., 2012) Using this information can lead to more innovative digital marketing approach that can increase companies' competitiveness. Nowadays the lack of information is not the problem that the companies are facing - the problem lies in having too much information. Innovative marketing communication approaches can be a good solution to this problem (Harvard Business review, 2017; Hudson Simon, Roth Martin S., Madden Thomas J., 2012; Lantos, 2015; Scannapieco, 2016).

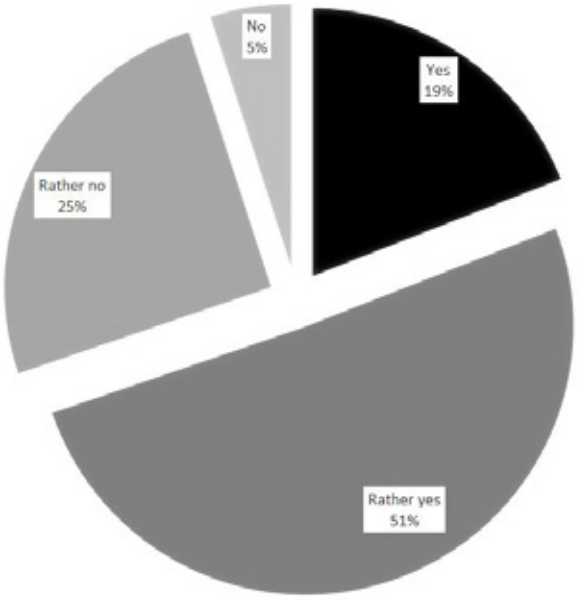
The modern technologies have led to consumer habit change - specifically the shopping habits. Therefore new term "Omni channel marketing" has appeared. With the use of the modern technologies consumers can simultaneously use more than one channel to obtain the information about the product or the company, or make purchasing decision, compare prices. It is difficult for companies to determine which combinations of channels and what channels the consumers are using, therefore all the information on the internet must be harmonized with all the rest marketing activities. The companies that can provide their consumers with the seamless experiences can achieve the greatest results in Omni channel marketing (Harvard Business review, 2017).

The main reason for the innovative marketing is the change in consumer behaviour pattern. Within the last 20 years the shopping habits of consumers have changed significantly (Pegler B., 2006.). The work/leisure proportions have changed, globalization and modern technologies have changed the decisions the consumers are making. There has also been a significant change in the research methods that the marketing specialists are using. With the changing environment and the increasingly saturated marketing environment the innovation in the marketing communications has become more necessary in order for the brands to stand out and catch the attention of the consumers. And while in other marketing channels diverse tools and sensory marketing can be used to differentiate one brand from the other, in the digital environment the tools that can be used for this purpose are limited. Therefore the authors of this paper suggest that more innovative approaches in digital environment are necessary when it comes to marketing communication for the companies to stand out.

2. Findings

The survey was conducted between 404 Latvians in the time period from 8.05.2017 to 15.05.2017 in the internet environment with aim to determine Latvian satisfaction with digital marketing communication – the quality of it and market saturation in Latvia. There were no age or gender restrictions as the overall situation analysis was being made. According to statistical data of the Central Statistical Bureau of Latvia, in the first quarter of the 2017 the population in Latvia was 1953 thousands (Central Statistical Bureau, 2017). With this population, the required sample size of the survey with confidence level 95% and confidence interval 5 is 384. With the 404 respondents the authors can refer the results to the all Latvians.

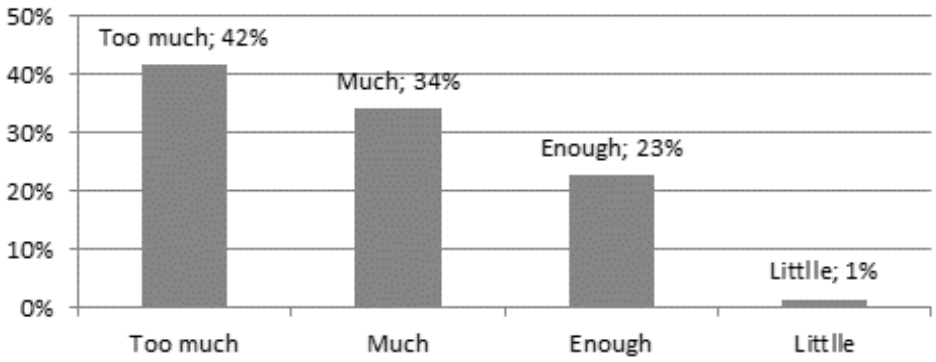
67.8% of the respondents were women and 32.2% - men. 51% of the respondents were rather satisfied with the marketing communication in Latvia, 19% were satisfied, 25% were rather not satisfied and only 5% were not satisfied with the marketing communication in Latvia (figure 1). Therefore the authors of this paper can conclude that the most part of Latvians are more satisfied than not satisfied. Nevertheless, almost ⅓ of the respondents were not completely satisfied with the marketing communication in Latvia, therefore improvements should be made.



Source: authors' construction based on the survey.

Fig. 1. **Satisfaction with Marketing communication in Latvia, %**

When asked about the marketing activities saturation in digital environment 42% of the respondents stated that that there are too many marketing activities, 34% stated that there is a large number of marketing activities in the digital environment, 23% stated that there is enough marketing activities in the digital environment and only 1% said that there is a small amount of the marketing activities in the digital environment (figure 2). The results show that in overall the consumers in Latvia believe that the digital environment is oversaturated with the marketing activities. These results confirm the authors' idea that the digital environment is saturated and therefore the marketing activities should be differentiated from the competitors' activities by using more innovative approaches.

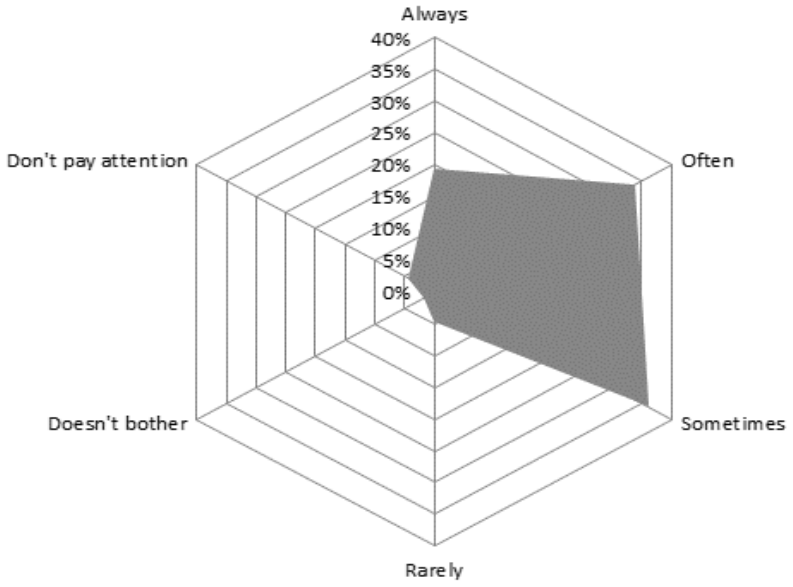


Source: authors' construction based on the survey.

Fig. 2. **Marketing activities saturation in digital environment according to consumers in Latvia, %**

19% of the respondents confirmed that they always find digital marketing activities annoying, 34% of the respondents feel annoyed often and 36% - sometimes (figure 3). Only 5% found digital marketing activities rarely annoying and 2% stated that digital marketing activities are not bothering them. 4% of the responded that they are not paying attention to the digital marketing activities. From the results it can be concluded that majority of the Latvians are

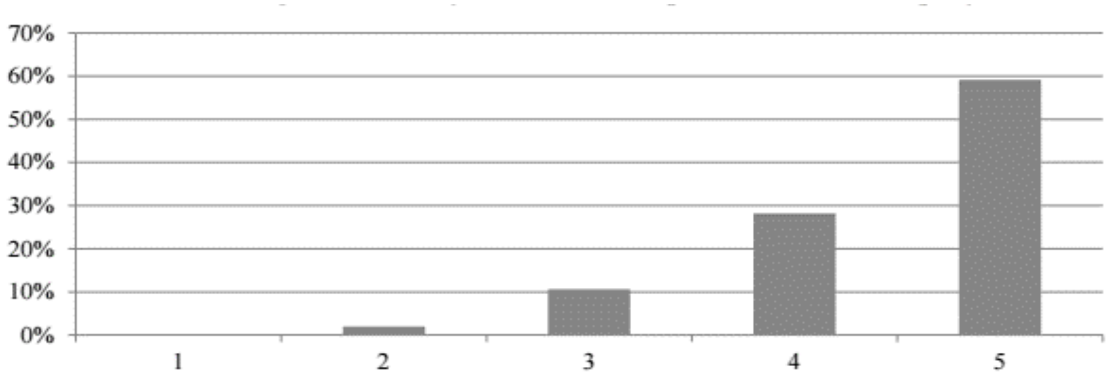
not satisfied with the quality of the digital marketing activities - they mostly find them annoying, therefore the quality, content and the visual appearance should be review.



Source: authors' construction based on the survey.

Fig. 3. **Frequency at which consumers find digital marketing activities annoying in a day in Latvia, %**

When asked about the non-standard marketing communication approach necessity in marketing communication in the scale from 1 to 5 with 5 being the largest (necessary) and 1 the smallest (not necessary) the average score was 4.44.(figure 4) Therefore it can be concluded that Latvians consider marketing innovation as necessary part of the marketing communications. The results also show that in general Latvians have positive attitude towards innovations, therefore companies should use their openness to innovation in their advance.



Source: authors' construction based on the survey.

Fig. 4. **The necessity of the innovative approach in marketing communications**

The overall results of the study show that Latvians consider marketing communications in Latvia effective, but digital environment is considered to be oversaturated with the marketing communications. Latvians are not satisfied with the digital marketing communications in Latvia, therefore more innovative and more appropriate approach would be required. It can be seen from the viewpoint of the consumers that the change is necessary, but it has not happened yet. The authors of the paper suggests that the first companies, which will make the positive change towards more innovative

marketing might have great advantages compared to other companies as the situation according to the Latvian consumers' opinions requires some improvements.

Conclusions, Proposals, Recommendations

Limitations, future research:

This study focuses in the overall innovative marketing communication; key ideas about innovative marketing are discussed as well as the attitude of the society in Latvia in general. Future research should focus on different areas and societies, including the exploration of the marketing tools that are more or less efficient in the implementation of certain marketing strategy. Discovery of the sectors where marketing innovation is more welcomed.. Finding key factors that would indicate the necessity of the innovative marketing and the efficiency of different tools certain situations should be explored. Cultural differences should be taken into consideration to determine the impact of the culture to innovative marketing development.

Key findings:

1. Although in general Latvians are satisfied with the marketing communications in Latvia, they believe innovation is still necessary.

2. The increasing saturation of the marketing channels might be the reason why innovation is perceived very positively in the Latvia.

3. No key factors or components of the innovative marketing have been discovered – the term itself is very broad. As innovative marketing includes using previously unused methods or using new combinations of already used methods it is difficult to place limitations within the strategy.

Conclusions and recommendations:

1. Key factor of successful innovative marketing strategy in long term is maintaining consistent brand image.

2. Human factors influencing the decision making process should be taken into consideration when implementing innovative marketing strategy.

3. One of the problems of digital marketing is the inaccurate and ineffective use of it.

4. Omni-channel marketing is the next evolution stage of multi-channel marketing and should become a part of innovative marketing strategy.

5. Database quality and usage efficiency affects marketing communication results.

6. The study of consumers and their behaviour is becoming more relevant as the environment gets more saturated with the content and human brain is incapable of processing all the information. Companies must find a way to differentiate themselves from others to increase the recall in consumer minds.

7. Companies should use different marketing approaches in digital world (e.g. influencers, video bloggers) to raise awareness as well as the positive image of the brand and to stimulate interest. Consumers have resistance to marketing therefore some of the promotion should be created in such a way that consumers would not perceive as marketing activity and rather as independent opinion of a third party to increase brand image and loyalty.

8. Improvements in digital marketing environment are necessary and should be implemented by the companies, which wish to improve their effectiveness. More innovative approaches should be used.

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DIGITALIZATION PERSPECTIVES OF SUCCESSFUL BRAND STRATEGY - *RADIO SWH* CASE

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Abstract. The brand strategy leads to coordinated branding and brand management. It is widely understood statement, but rarely applied in the radio market of Latvia. Recently *Radio SWH* has established clear brand strategy directions, which has led to masterpiece of both: emotional brand perception and rational business results, giving the station a tangible advantage over the competition and fundamentally improving its market positions.

The aim of the research is to analyze the pre- and after- effects of the implemented strategy and reveal the findings about relevance of these measures for the future strategy goals in digital environment.

Analyses, based on theoretical frameworks of brand development in combination with key performance indicators (rating growth, listener profile changes, "ability-to-charge-higher-price-per-thousand-of-audience" phenomena, and others), in order to draw important conclusions and develop recommendations for the next strategy actions including digital perspective for sustaining the current success.

Research methodology: Authors have conducted analyses of recent theoretical trends of strong brand building models. In conjunction with that, the Authors have also analyzed the newest available radio market performance indicators (Reach, AQH, CPT, listener socio-demographic profile and other indicators) provided by research company *TNS/Kantar* on regular radio market research in Latvia basis.

The major conclusion and finding of the research: *Radio SWH* case is a clear evidence of how an elaborated brand strategy in accordance with the latest brand building theories, based on deep market, customer and product analyses, generates a visible business advantage over the competition.

Key words: *Digitalization*, *Brand, brand strategy, radio market, Radio SWH*

JEL code: M31

Introduction

The clear brand and positioning strategy leads to coordinated branding and brand management. It is a process which must be integrated in all steps of marketing management including digital measures and solutions. It is widely understood statement, but rarely applied in the radio market of Latvia. As stated by Prof. Dr. Manfred Kirchgeorg for The Wall Street Journal – Online: "Branding is one of the hottest trends in business – and one of the most misunderstood." This is very true when specifically speaking about integration of an "analogue" strategy into digital version.

In 2015, Radio SWH, which is among leading and most listened commercial radio stations in Latvia, has established and defined clear brand strategy directions, implementation of which has led to masterpiece of both: emotional brand perception and rational business results, giving the station a tangible advantage over the competition and fundamentally improving its market positions.

The aim of this research is by comparing recent strategy steps taken with theoretical models, analyze the after-effects of the implemented strategy, reveal the findings about relevance of these measures for the future strategy goals in digital environment. Namely, the goal of the research is to pinpoint particularly important branding elements, which have led to outstanding recent performance of Radio SWH.

Analyses, based on theoretical frameworks of strong brand development, importance of brand identity, brand knowledge and elements, which lead from perception to definite action and business results, in combination with real life and measurable key performance indicators (rating growth, listener profile changes, "ability-to-charge-higher-price-per-thousand-of-audience" phenomena, and others), shall allow to draw important conclusions and develop recommendations for the next strategy actions including digital perspective for sustaining the current success.

Research methodology: firstly, the Authors have conducted analyses of recent theoretical trends and beliefs of strong brand building models. In conjunction with that, the Authors have also analyzed the newest available radio market performance indicators (Reach, AQH, CPT, listener socio-demographic profile and other indicators) provided by research company TNS/Kantar on regular radio market research in Latvia basis. These quantitative data have been processed by Supernova data software. Also, the Authors have conducted field e-research, collecting 412 respondents, revealing answers to questions concerning overall insight of tendencies and trends of factors, which are the most important when choosing which radio station to listen.

The sources of information used in the research are as follows: marketing and brand management literature, regular market research data about the radio market by TNS research agency, materials from information agencies and periodicals, unpublished materials.

Based on the research on the radio listening habits of the population of Latvia the article analyses the overlapping of the audiences of various radio stations and describes the demographic and psychographic profile of the consumers (listeners) of the main competing radio stations. The analysis indicates a significant overlapping of the radio listening audiences which confirms the need for strategic planning of the radio station brand development and strengthening its position in the market. Of practical significance are the questioning of current Radio SWH positioning strategy guidelines developed as a result of the research and coordinated with the mission, vision and core values of Radio SWH in year 2015. Authors shall provide evaluation of the recent strategy, and conclude which updates are required both in sharpening the strategy and driving it to more digital direction.

1. Theoretical aspects of brand positioning

When it comes to the brand strategy, the author points out that one of the world's renown brand development and strategy researchers Kevin Lane Keller has said that the brand strategy reflects a set of all brand elements involved, both conjunctive and differing, which can be used to promote sale of products or services. (Keller K.L., 2005)

That is, Keller indicates that the basis of the strategy is the best combination of most suitable elements chosen. Therefore, the strategy shows us to which company's product we should adjust one or another brand element in our possession.

In his book "The Future of Marketing" Johnson says the old approach to marketing and brand development has exhausted itself: the time when the marketing and advertisement had merely one direction, i.e. was consumer-oriented, has ended. Now the consumer expects and demands a dialogue. The consumer wants to be a part of the brand, the consumer wishes to impact and drive the brand's development, the value system of the brand and brand communication. (Johnson N., 2015) In such a way the consumer is like a nanny in a kindergarten both perceiving brands as personalities and building and influencing the development of these personalities.

Furthermore, Johnson often stresses three basic conditions that form the pillars of the new paradigm of entire marketing, and among other things, talks about brand development and management:

1) AUTHENTICITY — consumers want to participate in brand building and relate to those brands which they see as authentic, real and humane (Johnson N., 2015)

2) RELEVANCE — consumers want to participate in creation of brand's equity and philosophy to make sure that consequently the brand in its essence is optimally tailor-made to the individual "I" of each consumer (Johnson N., 2015)

3) TRANSPARENCY — in the age of rapid information flow, so characteristic of today, consumers' possibilities to find out absolutely everything about a brand and company are amazing. Besides opinion exchange among consumers will take place whether or not the company and brand owner wishes so; (Johnson N., 2015)

Also ability to adapt recent strategy patterns towards future big data conditions is rather crucial. There are transformation trends of social, economic and cultural habits in whole society. All the recent and simultaneous paradigm shifts are connected with active introduction of new information technologies. (Medvedeva T.Y. *et al*, 2015)

Brand researcher David Aaker emphasizes personality or humanization of a brand and five dimensions of it. That is, Aaker explains that brand personality is a set of human traits which can be attributed to a brand. These traits can be evaluated in several ways, with the following scaffolding question as the simplest one: if Coca-Cola was a living being, what would it be like? What would it do? Where would it live? What would it wear? What would it talk to at a party? What would its favorite topics be? (Aaker A.D., 2005)

David Aaker's daughter Jennifer Aaker continued her father's work and on the basis of a research where 114 personality profiles were created and asked to link to 37 different brands, 600 different and independently respondents in USA created a credible model, which helps to explain the brand profiles' similarities to humans and personalities.

According to belief of the Aakers, the father and daughter, personalization of brands provide the most efficient communication platform with the target audience. The authors believe that in order to overcome the existing comprehension gap between the brand developer and consumer's perception, one needs particularly sensitive and respectful forms of communication, which go beyond and are broader than the standard communication models. The brand personalization is rooted in a task to make as close and as emotionally deep connection as possible, which personalizes the brand as a familiar and reliable person. Reliability is the fastest way to the consumer's heart and hence a long-term loyalty. (Wagner D.S., 2017)

From all what is laid out in this subchapter, the author resumes that a brand is an intangible entity which separates one product or service from another, besides that difference leads to a more satisfied wish or need of a consumer. The basis of this difference, in its turn, can be rational, tangible, intangible and other kind of features, but most frequently they are clearly emotional and build the brand's identity. To put it shortly, the task of brand development is to ensure the right set of differing traits, which are important for a consumer, thus obtaining (for a company, product, service) relative competitive advantage over other rivals and in market.

Marketing strategist Nick Johnson speaks of 7 crucial facets which would permit to implement the chosen brand strategy with more efficiency particularly in the digital context, because today no competitive brand can survive without a digital brand support platform (Johnson N., 2015):

1) Correctly chosen, meaningful discussion topics;

2) Two-way information exchange;

3) Mental consequence of the content;

4) Communication speed matters;

5) To motivate all satisfied consumers;

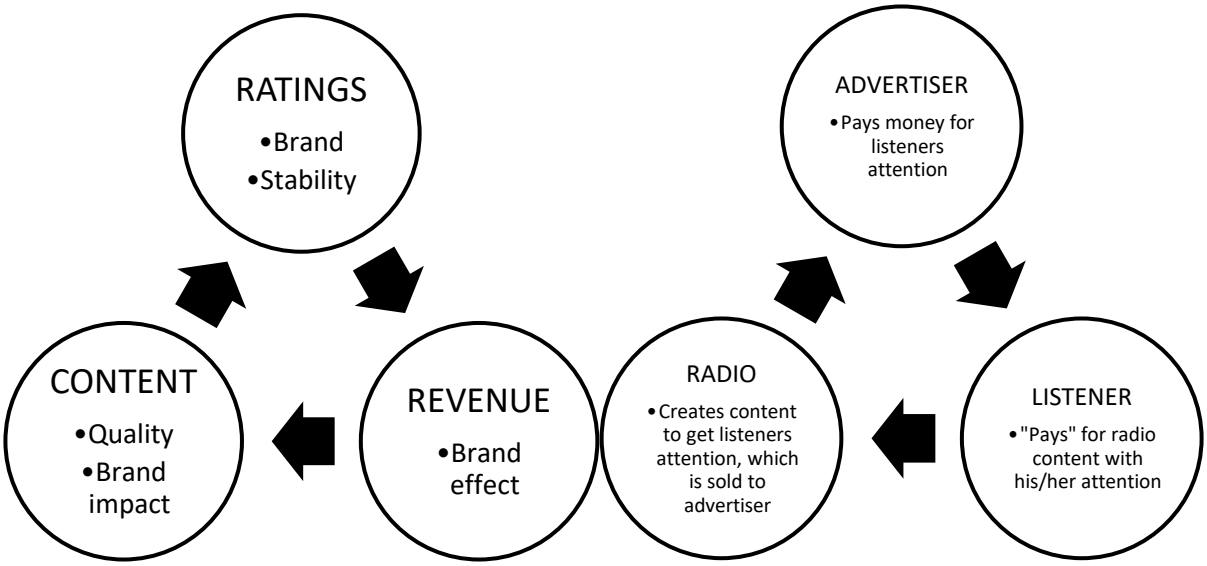
6) Digital environment is more suitable to building relationships and less suitable for direct selling;

7) One must become a part of consumers' discussion content.

The author from his part adds the eighth facet to Nick Johnson's recommendations, on brand's avoidance from creation of artificial followers. In other words, there are a number of companies which for the sake of growing the number of followers to its Facebook (or Instagram, twitter, draugiem.lv and other social sites) account encourage following them

by promising well-known good products, which are mainly goods or gift certificates chosen within a certain period of time if one "follows", "likes" or "shares" this or that task. Such follower base can be considered to be a crowd of social sites' clones which has almost nothing to do with a consumption potential. Increased number of natural followers can be perceived to be more valuable, because within a context of the brand those consumers have much higher loyalty potential, because a decision to follow is a gesture of loyalty in its own right.

Answers received to this analysis will provide a basis for brand strategy for the next cycle still keeping the long-term brand potential in the market. Besides, the authors recommend carrying out a brand audit on a regular basis and proactive manner instead of just reacting to perceptible changes in sales or market factors. Regular audit procedures will help to formulate the strategy more accurately and a precisely defined strategy, which actually is a brand development manual, will make sure business objectives and results are achieved more efficiently. (Kotler P., Keller K.L., 2006)



Source: authors' definition based on radio market analyses

Fig. 1. **Synergy of radio elements and stakeholders in radio structure**

If we are to talk about the structure of a radio theoretically, the authors point out that there is a closed circle of certain basic elements forming the radio industry, and they lay a basis for all consequential regularities (Fig.1) Namely, the radio offers a content in the market and demand for it will consist of its quality conformity to the interests of the chosen target group, and the format of its content will have a direct impact on the brand equity of the radio station in consumers' minds. The radio content, so to say, should be evaluated as radio product. (Further analysis of this regularity and industry model will be discussed later in this chapter). Product consumption is characterized by ratings. The more the listeners (consume this radio content) the higher the rating, which reveals a direct link to brand's popularity and equity, and constantly leading stations' ratings also indicate at certain stability and reliability in the minds of advertisers, too. Therefore, the advertisers are ready (and sometimes forced to) pay more and higher price to reach the audience. Sometimes the advertisers base their advertisement investment decision also on the power of radio station's brand and a positive brand effect is created here, which delivers larger cash in-flow to radio's advertising sector, regardless of the fact that, if we looked at it rationally, this particular radio station would not the best choice for placing an advertisement. To round up this idea, larger income to a radio station means larger competitiveness in the radio industry's market and it can afford to direct a portion of income as investment in the content and product quality, which, in its turn, again leads to higher ratings and increased advertisement investments from advertisers' part. So, a radio development spiral is created with important emphasis on radio's rotation along the development ellipse rather than the opposite, because the opposite effect is also observable. In

other words, if due to competition, market or force majeure-related circumstances the radio's audience decreases, it leads to less income from advertisement sales and consequently for a radio to continue existing it cannot afford the best content ingredients, for instance, popular radio personalities or outstanding self-advertisement expressions, which does not allow implementing the intended brand strategy etc.

That is to say, if in the common market situation one should talk about consumer, product and its seller, this relationship cycle in radio industry has several layers as there are mainly three parties involved (Fig. 1.):

1) Radio consumer is a listener who consumes radio product or content by paying for it conditionally with his or her attention. Namely, the scope of attention is the value which the listener "gives away" in order to consume the offered content. The more content a listener wants to consume the more attention he or she must give away. It means that in radio industry the consumer is a listener who pays for the product with attention.

2) Radio produces content consumed by the listener. In this case the radio is a producer developing a product according to the market (consumers) demand regarding its content. Listeners' wishes are the potential directions of possible content differentiation. Existing radio stations of the industry consciously or unconsciously choose their content positioning also according to the brand equity and development strategy so that the content is suitable and does not resonate with the core mission of the radio, and it offers to the chosen market segment also combinations of higher or lower quality elements (radio format, music format, frequency of news and specifics, blend of radio personalities, author programs' content and other decisive elements of radio). Radio receives attention from a certain audience to consume or create the content in return. Radio can sell this attention to advertisers. Author devotes the third chapter to the analysis of importance of these aspects and factors as one of the radio station's criteria by using the data obtained in the study;

3) Advertisers which are ready to buy attention of one or another audience are thus reaching their target audience and delivering the necessary message.

2. Radio market in Latvia and identification of Radio SWH competitors

Radio is a crucial media for the Latvian public. Radio listening habits are stable and have not changed considerably also over the recent years, notwithstanding the fact that the boundaries of the format have become more blurred and media competition is driven more and more by the content. Media boundaries are largely defined by increase of digital solutions' popularity. If some ten years ago it was normal not to have overlapping media format boundaries, currently there is a number of media offering much broader availability of the content. TV can be watched as a recording, newspapers can be read digitally, environmental advertisement manifests dynamically and innovatively, radio stations provide live video streaming, almost all major media create content also in social sites.

According to rating data provided by TNS, approximately 60% of residents of Latvia aged 12-74 listen to radio every day (Reach% Dly), but within the framework of one week (reach%) radio stations reach approximately 80% of all residents of said age group. Besides, the average amount of listening tends to increase, reaching 264 minutes or almost 4.5 hours a day. Most frequently listeners listen to the radio at home and work but the third most popular answer is — in the car. (Kantar/ TNS, 2016)

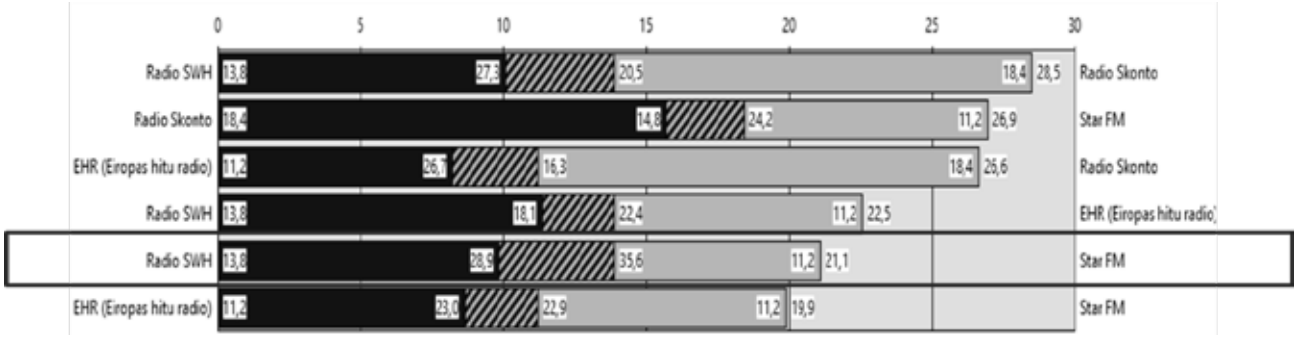
According to reach data (according to TNS Autumn 2016 survey) the largest number of listeners is reached by Latvijas Radio 2, while the most popular commercial radio is Radio Skonto (311.8 thousand listeners per week). The second most popular commercial radio station is Radio SWH with 234.5 thousand listeners per week. (Kantar/TNS, 2016)

It must be marked, that in general the stability or increase in reach is characteristic to locally formed, live content stations, which also indicate at dominant traits of listeners' demand. These are three most popular commercial radio stations — Radio Skonto, Radio SWH and Star FM (190.3 thousand listeners per week). The fourth place is taken by digitally oriented radio European Hit Radio (189.7 thousand listeners per week). (Kantar/ TNS, 2016)

In order to identify the intensity of competition, the authors analyze audience overlap by determining that the larger the proportion of unstable listeners, the stronger the mutual station competition. Data shows that the largest audience overlap is between Radio SWH and Star FM (Fig.2). Namely 28.9% of SWH audience would listen to Star FM interchangeably. Equally 35.6% of Star FM listeners occasionally prefer Radio SWH station. It means that Star FM listeners can be currently deemed as sufficiently unstable, because more than one third of total audience of Star FM has not clear loyalty and they are looking for alternatives. Such situation can be perceived as an opportunity, because with a proper understanding of wishes and causes of doubt in this part of audience, one can define the perception advantage combination or positioning, which would make Radio SWH the only choice.

Besides if we are to compare with the situation in May 2015, the unstable portion of audience on Radio SWH part has decreased from 35.4% to 28.9% or by 6.5% points. The authors point out that during said period Radio SWH was only in the beginning of brand development strategy elaboration and implementation. The authors conclude that the later elaborated strategy has led to a positive result in terms of Radio SWH brand.

According to audience overlapping perspective, the next closest rivals are Radio Skonto (27.3% of audience would listen to Skonto) and EHR (18.1% of Radio SWH audience often choose EHR as an alternative) respectively.



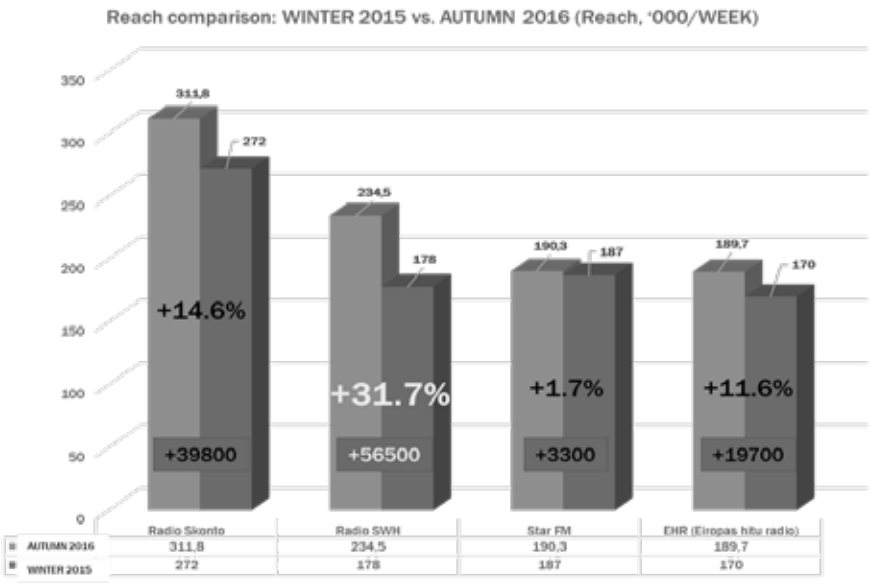
Source: Kantar TNS radio research data: Autumn 2016

Fig.2. **Overlapping between competitors in 2016**

By analyzing also data of each station's audience, the authors conclude that direct strategic rival of Radio SWH is Star FM (accordingly with similar audience demography traits, stations compete for audience mainly in 25-45 age group, average and high income) followed by secondary competitors: Skonto (reach leader, yet with other specifics) and EHR (leader in youth audience, therefore should be evaluated as competitor in a long-term strategy). When defining the strategy, these aspects are crucial to identify the priority of the strategy's direction.

4. Recent strategy aftereffects, business results, and market trends

The authors have created a summary of main operational elements (Fig. 3.). They compare the indices of 2015, when the implementation of the new strategy had commenced, to the last Kantar/TNS ratings two years later. We can see that the increase is observed in all major radio stations, which obviously is an important trend, which the authors are not going to analyze here. The largest increase is achieved by Radio SWH — both in terms of extended audience (+56500) and scope (+31.7%).



Source: Kantar TNS radio research data: Winter 2015, Autumn 2016

Fig. 3. **General Key performance indicators of competing radio stations**

Implementation of the strategy has given both better reach figures and also a tangible CPT index effect from brand development.

Table 1

CPT index of Radio SWH and its competitors

	Reached audience, on working days between 7:00 - 10:00 (Reach, thousands a week)	Price for radio contest with 15 self-advertising spots (EUR)	Price-CPT index (euro for reached thousands of listeners)
Radio Skonto	166.1	€ 600.00	€ 3.61
Radio SWH	133.5	€ 900.00	€ 6.74
EHR	82.1	€ 250.00	€ 3.05
Star FM	94.9	€ 380.00	€ 4.00

Source: Kantar TNS radio research data: Winter 2015, Autumn 2016

In Table 1 the authors have summarized Radio SWH and direct competitors' standard contest/column's prices, which are obtained from unofficial, yet very credible commentaries by acquaintances of persons working in the industry. It is possible to calculate CPT index (by dividing the contest's amount into thousands of reached audience) from the given information. Table 1 clearly shows that competition price in Radio SWH per one reached thousand of listeners is considerably higher than the prices of major rivals (1.69 times higher than for Star FM, 1.88 times higher than for Radio Skonto and 2.21 times higher than for EHR). If we analyzed it superficially, one could think that given such prices and equal products Radio SWH air should exist without advertisers' investments, yet the situation is paradoxically opposite and Radio SWH, on average annual scale, implements approximately 80% of all advertisement opportunities and what is defined under Section 47 of the Electronic Mass Media Law (scope of advertisement shall not exceed 20% per hour or 12 minutes per hour). (Law of broadcasting, 2017)

5. Main criteria in radio selection

In Table 2 the authors have summed up the major features of the study, where 412 respondents assessed different traits of radio station by evaluating the most crucial ones. The evaluation was done in 5-point scale where 1 represents absolutely insignificant and 5 — very significant criterion. Evaluations in said table were broken into evaluations of different age groups. The highest and lowest evaluation in the age group with an added average evaluation for the entire survey was shown for each criterion.

Table 2

Evaluation of different criteria between age groups

	AGE GROUPS						
Radio factors	**12-19**	**20-28**	**29-35**	**36-45**	**46-60**	**61-74**	**Average**
Innovations	2.81	**2.71**	2.88	**3.06**	2.77	2.9	2.87
Social networks	2.13	2.02	2.23	**2.67**	2.61	**1.45**	2.26
Brand	2.93	**2.84**	2.97	3.45	**4**	3.81	3.17
Out of box solutions	3	2.85	**2.7**	**3.2**	3.11	3.05	2.94
Music	**4**	4.5	4.67	4.6	4.07	**4.72**	4.5
Personalities	**2.84**	3.07	2.95	3.6	**3.92**	3.22	3.21
Exclusive content	3.06	3.05	3.06	3.41	**2.84**	**4.5**	3.21
Festivals	**3.43**	2.42	2.75	3.29	3.07	**2.18**	2.86
Humor	3.51	**3.49**	3.75	3.87	**3.92**	3.73	3.7

Source: authors' calculations based on e-field research (March, 2017)

When analyzing data, the authors concluded that "Music according to respondent's taste" was marked as the main criteria. 0.129). Besides, this factor is slightly more important for women (4.57) than men (4.42). "Humor in the air" has similar results (Sig. 0.002) and "Radio content without advertisements" (Sig. 0.032 the last in the list of key elements of radio station is "Well known radio personalities" (Sig. 0.385) and "Exclusive radio content not offered by other stations" (Sig. 0.097).

Authors go on concluding that "Radio brand" is also an important factor (Sig. 0.000). Besides, if we were to analyze men and women audiences separately, the men would tend to expect radio to offer technological and innovative radio solutions (3.02. Sig. 0.055), while women find it more important to have "Radio co-participation in festivals and other popular public events" (2.90, Sig. 0.207).

6. Radio SWH brand positioning strategy points

Based on previous analysis, the authors are going to evaluate current Radio SWH brand strategy definition by identifying Radio SWH positioning and its' potential according to competitors' situation, as well as outline desirable brand strategy points in order to fully ensure conformity of unique advantage factor defined in the brand strategy to wishes and hopes of consumers.

For this task the author is going to use the brand identity model example by Aaker and Joachimsthaler which stipulates that for the purpose of defining a brand (and describing its essence) one should include explanations of the following elements (Aaker, A.D., Joachimsthaler, E., 2000):

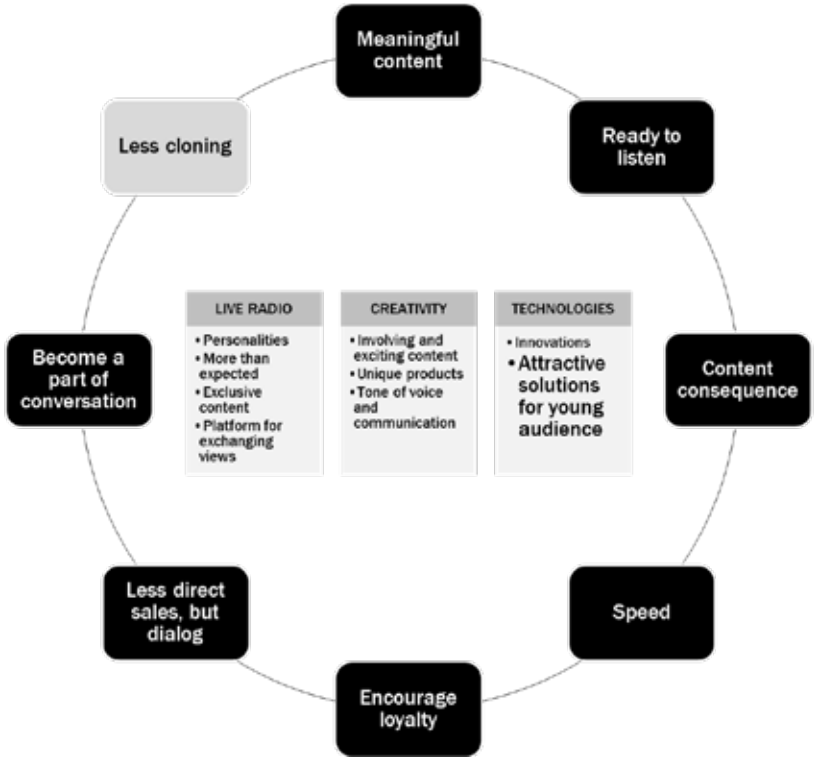
1) Definition of brand essence derived from other brand identity components;

2) Core identity, which in the context of radio would explain such crucial aspects as content, radio personalities, creativity in communication, innovations;

3) In-depth identity stressing extra advantages (if any), for instance, characterization of the brand as personality, clear and unique symbols and other characteristic elements;

4) Added value: what rational and emotional advantages the brand offers to a consumer and what other important values make the brand better in perception of the consumer;

5) Explanation of relationships: how the brand builds relationships with its consumers and how they perceive it;



Source: Authors' defined using and combining Aaker, Joachimsthaler and Nick Johnson models

Fig. 4. **Radio SWH positioning, brand, and digital strategy update (2017)**

By analyzing the radio market in Latvia, identifying direct and secondary competitors for Radio SWH, considering the results of audience study and most important radio selection criteria, effects and advantages of current strategy growth and economic factors, as well as by analyzing conformity of strategy defined in 2015, the authors conclude that the strategy should be basically kept. However, in combination with the digital perspective, the authors put forth three essential strategic facets, which according to Nick Johnson's "digital strategy ring" confer the additional sharpness of current strategy, define the following aspects as the strategy's milestones: Live radio, Creativity and Technologies (Fig.4.). Each aspect is provided with a strategical explanation below.

Live radio:

1) The most important aspect is an ability to deliver "more than usual" and "outside the box" strategic commitment as it ensures unconventional content solutions in a radio and offers exclusive content to the listeners (keeping of author's programs, topical interviews, humor in the air). Such strategy will ensure the major distinction from the rivals, besides such potential difference will be duly appreciated, it implies a potential to attract and recruit listeners of competing radio stations.
2) Radio must be able to attract new radio professionals and develop the existing ones. Demanding audience of Radio SWH determines that content quality is crucial. Average solutions will bring discontent in audience, which is vitally important, because it guarantees higher income to Radio SWH as it is attractive to advertisers.
3) This category should essentially include music factor, because it is the most important of aspects influencing the choice of a radio station. Radio SWH must scrupulously analyze the suitability of music to the defined audience both through regular monitoring of its audience and its feedback and offering broader range of

music than competitors and building the image of the station as the only music expert in the market with music tops, reviews, programs and columns as well as participating the major festivals and concerts are rather a strategic position than a marketing department's whim.

4) One must ensure live dynamics and topicality of the content. The listeners have pointed out that they find it important to receive extensive and varied information, yet in a very concise and regular way. Therefore, columns in 5 minutes' format will be those to characterize and associate with Radio SWH in future.

5) Advantage of live radio is building of a dialogue, therefore, as the wishes of listeners indicate, the radio must serve as an opinion exchange platform and such exchange should be enhanced.

6) In terms of content structure it is important to focus on the extensive audience, for which the radio is an important media while driving a car

Creativity:

1) The major task of creative facet is inclusion of unconventional solutions in radio content by continuously offering new columns, competition ideas, where the contend with added value is more important than the prizes, as well as other manifestations, which consequently surprise and please listeners.

2) Creativity must manifest in brand communication, aspiring to be one step ahead both in terms of radio content product and self-advertisement expressions and presence in socially important events and music festivals as the primary goal.

3) Creativity must be reflected also in events and activities focused on attraction of youth audience.

4) Advertisement solutions must be creative and integrated into the content, allowing consuming the advertisement news with interest not disguise, to an extent possible avoiding and calling also partners to create utmost unconventional advertisement solutions, promotions and activities.

Technologies:

1) Radio must always offer the latest innovations in the market thus appealing both to youth audience and allowing the existing audience to consume the content in modern technology platforms and possibilities.

2) Presence in social sites is crucial in the long-term development of the brand, therefore it is important to consequently develop also a digital product and tool package.

3) Technological solutions should be based on a task not to complicate the life of potential listeners, but to make radio content more available regardless of the location and time, taking into account optimum content adjustment to each individual wish in a long-term perspective.

4) But, one has to assume that any innovation requires time for adaptation processes, as they serve as stimulus for changing the recent environment. Nevretheless, the time has to be considered as an investment, because using technological and product innovations, enterprises create competitive advantages. (Bibarsov K.R. *et al*, 2017).

As authors believe, the above mentioned aspects would create masterpiece of results for the radio brand strategy.

Conclusions, Proposals, Recommendations

In the conclusion, the author deduces that Radio SWH brand development strategy put forth two years ago has been suitable and has provided a chance to strengthen positions in the market. Currently the strategy audit will help to understand the major competitors of Radio SWH and previously defined strategy additions will make it possible for Radio SWH to fix their distinctive position even more, followed by further improvements in the market position and financial indices.

Authors propose the following conclusions and recommendations:

1. Audience doesn't still recognize the ongoing digital shift of radio. Usage of social media is high, but not expected. Other factors currently are perceived to be more important.
2. Regular listening habits are dropping, especially for youngsters. This must be one of the aspects which drive future strategy.
3. Well-shaped strategy gives competitive advantage and scores for KPIs. As well as, digital strategy must come hand-in-hand with general strategy, but containing digital ingredients for better taste.
4. Direct competitor in future is Star FM station, because it has the major audience overlap, according to demography data the audiences are most similar, and the elements of brand identities have the largest number of common and similar aspects;
5. The secondary competitor is EHR, because this station is a potential threat to attraction of new audience, as witnessed also by the rating data. Besides, EHR creates an ambitious image of technologically developed product deliverer in the market, although from the technological perspective the current solutions are not special and unique.
6. Radio Skonto should not be perceived as a direct competitor, because Radio Skonto audience builds naturally, by age. That portion of audience has a different view on topical values and to convince such audience in favor of communicated alternative will consume the most time and resources.
7. Conformity of Radio SWH brand strategy must be based on three pillars: live radio conception, creativity in all aspects and technology leader. The same strategy must be implemented also in digital aspect both: as a synergistic ingredient of general strategy and one-direction implementation.

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UNCOVERING THE SUPPORT AND TRUST IN EMPLOYMENT SEEKING PROCESS USING SOCIAL NETWORK SITES

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Abstract: The objective of the paper is to present a suitable model for the dimensions Support and Trust of social capital theory for social network sites (SNS). This study explores the potential considering the use of SNS in employment seeking process. It is tested for both private SNSs e.g. *Facebook* and business SNSs e.g. *LinkedIn*. Results show that both types of networks have similarities in nature but are found differently while implemented in Employment Seeking Process. The assumptions for business network for employment seeking are prone to be more common than the other. Support and Trust were tested with Partial Least Square (PLS) structural equation model. The paper based survey has had 440 respondents which results are included in this research and findings of the paper.

Key words: employment seeking, human resources management, social capital, social network site

JEL code: D85, O15, C52

Introduction

Social networks are invading our society and lifestyle naturally. Anybody can be a member of different social networks. The SNSs are continuously changing and creating new innovations for their user. It appears to be in both types: 1) business network sites and 2) private network sites. Both are technological based social networks. Creation of their ties virtually has attracted users to make use of it. Normally, a new user of the SNSs have to register to become a member before inviting friends to join their network, and it create ties with friends (Boyd & Ellison, 2007). It creates opportunity to present themselves to a large audience, either exposing their profile information or respond on postings. In nationwide, popular private network sites consist of *Googleplus* and *Facebook*. In Germany, *LinkedIn* and *Xing* are popular for business use. Extended use of social networks in different fields has initiated numerous academic research related to many aspects on use of social networks including employment seeking process. This paper empirical part use data from a survey of students at University Ludwigshafen (Germany). The collected indictors are part of a bigger survey to research the behaviour of employment seeking individuals. The data obtained in survey has been calculated with PLS, structured equation modelling and analysed by different statistical tests. The management and business issues including the human resources field can be investigated with PLS (Sander & Teh, 2014c) (Hair et al., 2014). PLS is a suitable method to investigate SNSs under consideration of the employment seeking process.

The Usability of Social Network Sites for Individuals

Relationships are important for individuals in their employment seeking process. Networks coordinate tasks between individuals or organisations (Nahapiet & Ghoshal, 1998). Social networks concentrate on individuals, which implanted relationship among people. This relationships create a web of social structures if the environment allows the creation of the relationships, and there is no barriers in preventing the creation of the relationship (Coburn et al 2010). Leading to a real or remaining virtually relationship.

Social relations typically have norms, rights, obligation, reciprocity, dependency, equalities and rules. The relations are needed to organize processes, understand behaviour and mechanism of social construct. That means social relationships are influenced by many variables and issues. That makes them complex and difficult to investigate (Ellison et al 2007; Daigremont, Skraba, Legrand, Hiribarren, & Beauvais, 2008). The network can include member and exclude member from the access to resources and information. The inclusion is a benefit for the member to get access to resources for example. The value of a resource depends on the accessibility and the exclusion of social networks provides only a defined group of members access to desirable resources which makes the social network beneficial (Daly, 2010). The network can reduce disadvantages as the possible damage can be shared by network members or the decision can be supported by knowledge and skills of other network members. None member of networks do not have access to the resources and information. That is their disadvantage.

The motivation of organisations and individuals to take part in a network is the benefit of the network, the member of the network use the network to reach their objectives, to improve their situation or to learn new skills (Moolenaar & Sleegers, 2010). The distance in the network between the actors is important for the influence on network members, peers have the best influence on each other. The kind of relationship and structure of the network influence the level of trust and readiness to support each other (Burt, 2001). The social network is the entrance to new market and makes the exchange of information and resources faster and more easily. The transaction costs can be reduced because people trust each other and cost to monitor process are not needed for example. The reason for this advantages is that market member imagine a behaviour or attitude with the membership of a social network (Sander, 2013; Ikeda, 2008). That can be seen for example with elite universities and their networks to provide their students positive support to find employment.

The individual's networks have different tasks, objectives and purpose. Individuals can be member in work related networks, leisure time related networks or interest related networks for example. The membership in SNS is mainly freely. The membership in social networks can depend on regional, ethical or cultural reasons for example and the membership cannot exist without any investment or action of the individual (Heidenreich, 2011). The embeddedness in social networks depends on the investment, behaviour and objectives of the individual. This can be controlled by the individual and depends not if the social network is real or a virtual SNSs (Kadushin, 2004). The participation level depends on the interest and capital of the individual. That means individual use SNSs for their benefit or need. Engagement at SNSs for the employment seeking process depends on the situation and opportunities of the individual. The number of ties are important to increase the potential chance to find needed resources (Hite, Hite, Mugimu, & Nsubuga, 2010). SNSs increase the numbers of ties heavily and provide more opportunities to get beneficial and valuable access to resources. That can be the reason to join a network and is an argument for the support variable which has been created as a variable in the model to explain the use of SNSs.

Social networks can substitute products and add information to consumers to made decisions. It reduces transaction costs and makes it possible to identify valuable business chances or to get access to business opportunities. The network is necessary for the market access and valuable exchange of resources. The knowledge about the behaviour of individuals and the experience with the market members which are part of the network reduce the risk of exchange and anybody in the process knows expectations of each other (Weyer, 2011; Behtoui, 2015). The network has a benefit for the individual and market. The value of the market increases with the social network because the market provides a platform to exchange profitable resources which are not access able without a social network. The SNSs enables individuals to support each other for the employment seeking process. The resources are embedded in the social system and the investment of the individual in the social networks (Hajli, 2015). The difference of SNSs and social networks is that SNSs cannot exchange tangible resources. That means theoretical the trust in SNSs has to be higher than in real networks because a direct exchange of real resources is not possible and the value of the exchange is not immediately visible. Exchange is

bidirectional and needs a minimum of trust in general but SNSs exchange needs more trust as the exchange needs more time to get the needed resource. The anonymity in SNSs exist because member do not know each other in person and the user of SNSs can use another identity for example (Stegbauer, 2011). That means social networks has an effect on the individual and all SNSs member (Jansen & Diaz-Bone, 2011). The labour market has rules, norms and regulations. Social networks can create corruption and partisanship (Granovetter, 2005; Sander, 2012). The membership and use of social networks influence the level of risks and chances for the employment seeking process. For example the membership or use of a network can have a negative outcome for the candidate or the career of individuals (Gray et al 2007; Teh et al 2014).

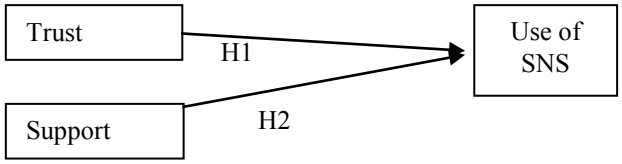
The members know the rules and norms of the network and know that unexpected behaviour can be penalized by the network. The network member share norms and values that support the trust and can be a basis for trust. Individuals have general trust to a person which depends on the attitude of the individual but the trust can be increased with the experience and history of a relationship in a social network, than has trust been created in many processes. In addition exist characteristic based trust that means individuals with similar cultural, social or regional background trust each other more as they have similar norms, ethical values and cultural background (Heidenreich, 2011; Sabatini & Sarracino, 2014). Social networks have an accumulation of different kinds of trust depending on the environment, situation and individual in social networks. Trust is an import part of social capital and can explain mechanism and behaviour of individuals in social networks. Networks provide an environment for individuals which protect the members. The network creates an environment of trust and exchange which supports member. That provides a situation to be innovative, creative, to find solutions or to operate independently for example. It is possible to make difficult decisions in a trustful environment easier. The social network environment provides a basis to share knowledge on a trustful basis (Finnigan & Daly, 2010; Mu, Peng, & Love, 2008). That provides knowledge to improve decisions for example. The network operates as a lab or protected area for the network member. That provides the opportunity to present interesting skills or expert knowledge to potential employer (Baker-Doyle & Yoon, 2010) and the network can be used to identify individuals with needed skills or knowledge. The arguments above are the reason to use the variable trust as a variable for the model.

The ownership of resources depends on the individual situation. Individuals own resources and that explain the role and power of them in social networks. That means social network members have different resources with different value. Resources can be financial, physical or information for example (Hite et al., 2010). The resource information is the only information which does not deplete much compared with other resources. The network members have to be aware that they invest more than other network members or their obligations for provided resources are less valuable. That issue influence the behaviour and mechanism in social networks. The employment seeking market is offering employment opportunities and skilled labour. The power of the network members depends on the situation (Heidling, 2011). In some cases individuals have valuable seldom important skills for employer and in other cases have employer desirable offers for individuals. The network power in this case is difficult to define in general and has to be under consideration for the research of SNSs for the employment seeking process. The willingness to take part in a network depends on the value of the individual and expected obligation on the investment in the future. The investments of resources in a network mainly are not for a short period, individuals invest in social networks resources to have a benefit in the future. They trust that they will get obligations for their investment. That can explain the behaviour of individuals to recommend candidates to employer. They expect that the individual who gets the employment will support them in the future and the employer provides some beneficial value to the person who has recommend potential employers. But involved individuals have to be aware that the recommendation of potential candidates has to be successful to be valuable.

Measurement

This study further explore our previous study in employment seeking process (Sander & Teh, 2014a). The main identified factors for the mechanism of social capital are trust, exchange of resources or information, support and obligations or reciprocity (Sander & Teh, 2014b).

The first hypothesis investigates the influence of trust on the use on SNSs. If people trust the content of SNSs under consideration of the employment seeking process than they are more intensive using SNSs. The second hypothesis is regarding the influence of support on the use of SNSs. The hypothesis is if the employment seeking process is supported by SNSs than individuals use more intensive SNSs.



Source: author's construction

Fig 1 **Model to measure dimensions of social capital**

The variables support and trust are explained with a minimum of three indicators. The three indicators have been collected with the survey. The indicators in detail are presented in the following parts. The indicators are relevant for business network sites, private network sites or both kinds of SNSs. That means the model has been tested twice, one time with indicators regarding business network sites and a second time with indicators under consideration of private network sites.

The construct is under consideration of the employment seeking process and the assumption is that there is a difference between private network sites and business network sites (Sander et al 2015). The hypothesis is that the level of trust influences the use of SNSs and that the trust variable is responsible if people use SNSs for the employment seeking process. The level of trust can explain the use of SNSs and influence the use of SNSs regarding the employment seeking process. The second variable is the received support from SNSs regarding the employment seeking process. The hypothesis is that people who received support from SNSs for the employment seeking process are deeper involved in SNSs e.g. frequency of use of the SNSs.

The advantage and reason that this people get more support or trust SNSs is that they invest more time in SNSs, that they are more involved in SNSs. The use of SNS is explained with the duration of membership in SNSs, the time people use SNS daily and number of contacts at the SNSs.

Demographic Characteristics of Respondents

The data for this model has been collected in survey of students at University of Ludwigshafen in October 2014 with a survey to explore the employment seeking process. Students were selected as research target group: motivated to get education for further employment; having theoretical background as result of studies (different from those who are not involved in higher education), active in use of new technologies options, willing to share the findings in employment seeking process. The survey has had 440 participants, living in Germany and speaking German. The statements of the survey could be evaluated by the respondents on a four point Likert scale from one for always to four for never. The survey has different parts to explore desires and needs of employment seeking individuals. The age median is 25 years and the average age is 27.62. The gender distribution is 60.5% female, 38.9% male and 0.6% "no answer" (the gender distribution in the survey corresponds with the population of this target group in Germany). Two hundred seventy five of the participants are currently not looking for a new employment opportunity, 105 of the respondents were searching

passively for employment opportunities, 48 of the respondents look actively for an employment opportunity and 12 respondents did not answer this question. The participants use SNSs for the employment seeking process, 9.43% use always SNSs for the employment seeking process, 20.46% often used SNSs for the employment seeking process, 32.87% sometimes and 37.24% never used SNSs for the employment seeking process.

The educational level of the participants is 163 participants have an university degree, 136 participants has done an apprenticeship, 131 have a secondary school degree, one participant did not have a degree and nine representatives of the respondents did no answer this question.

Statistical Tests for the Model Robustness and Quality

The methods used for research required to prepare the data obtained in survey to divide them: data have been organized in the bootstrap with 5000 subsamples. The first step has been the construct robustness and the second step the explanation power of the model.

Testing the Reflective Model

The reflective model tests the indicators which are influenced by the variable support and trust. Those indicators are the result of the construct. The first test for the quality of the model is the indicator reliability for the reflective model. This test confirms the significance for the outer loadings and gives a first indication for the reliability of the model.

Table 1

Indicator Reliability of the model for business and private SNSs– Outer Loadings reflective model between items and the use of SNSs

Value of the indicators for variables of the reflective model to test validity.	Outer Loadings	Sample Mean	Standard Error	t Statistics
Business network sites				
Used SNSs to identify employment opportunities	0.77	0.77	0.03	25,12
Frequency of use of *LinkedIn* to identify employment opportunities	0.72	0.71	0.04	17,50
Frequency of use of *Xing* to identify employment opportunities	0.85	0.84	0.02	43.17
Private network sites				
Used SNSs to identify employment opportunities	0.75	0.75	0.06	11.96
Frequency of use of *Facebook* to identify employment opportunities	0.82	0.81	0.09	22.70
Frequency of use of *Googleplus* to identify employment opportunities	0.58	0.57	0.10	5.72

Source: author's calculations

The indicator reliability requirements are fulfilled if the loadings are above 0.7. The significant level is 5% if t-values are above 1.66 (Chin, 2010). The t-values are all above 1.66 that means the results are significant on a 5% level for business and private social networks. All loadings for the business networks are above 0.7. The result for the private network sites fulfil the requirements for two indicators but the loadings for "Frequency of use of *Googleplus* to identify employment opportunities" is only 0.581. The findings by several researchers and their publications in the scientific literature give the indication that 0.6 for loadings are acceptable if the convergence criteria are fulfilled. That indictor has to be under consideration for further steps.

The convergence criteria are listed in table 2 for private SNSs and business network sites. One factor is the composite reliability and the results should be between 0 and 1. Acceptable results are above 0.6 or higher. This criterion is fulfilled for the survey data.

Table 2

Average Variance Extracted and Composite reliability results for the model

Variable / Value	Average Variance Extracted (AVE)	Composite Reliability (CR)
Business network sites		
Use of social network sites	0.61	0.82
Private network sites		
Use of social network sites	0.53	0.77

Source: author's calculations

The "average variance extracted value" (AVE) should be above 0.8 but it is acceptable if value is above 0.5%. But with the composite reliability results is the AVE result acceptable. The result 0.5 describes that 50% and more of the indicators explain the construct (Ringle & Spreen, 2007). This means that the survey results analysis for the requirements for the convergence criteria is fulfilled.

Table 3

Latent Variable Correlations Business model and private model between the variables

Latent Variable Correlations –Business model	**Trust**	**Use of SNS**	**Support**
Trust	1.00		
Use of SNS	0.48	1.00	
Support	0.43	0.51	1.00
Latent Variable Correlations - Private model	**Trust**	**Use of SNS**	**Support**
Trust	1.00		
Use of SNS	0.48	1.00	
Support	0.42	0.42	1.00

Source: author's calculations

The Fornell-Larcker Criterion is a further indicator for the discriminate validity of the model. That means for the reflective model that the ("Latent variable correlations")^2 < AVE. The list below describes the values for the both models for the latent variable correlation.

The two tables above describe the correlation of latent variables and the squared results of those values are less than AVE. That means that the discriminant validity requirements are fulfilled.

The results for the reflective model are acceptable. That means that the requirements to accept the model and the power or the model are confirmed for the reflective part with statistical tests.

Testing the Formative Model

The formative model describes the indicators which influence the variables those indicators are the reason for the result. The first test used for data analysis is to identify the significance of the indicators. The outer weights and results of the survey data analysis are presented in table 4 and 5.

Table 4

Outer weights - Business network sites with the variable support

Value of the measured indicators for variables of the outer weights to test validity.	Outer weights	Standard Error (STERR)	T Statistics (|O/STERR|)
Know the platform *LinkedIn*	0.37	0.09	4.02
Know the platform *Xing*	0.19	0.09	1.94
Xing support the employment seeking process	0.55	0.08	6.22
SNSss provide the opportunity to consult employment seeking individuals	0.41	0.08	4.67

Source: author's calculations

The weights have to have a t-value above 1.66 to have 10% significant or above 1.98 to have 5% significant. Only two indicators are below 1.98 and one the indicator "Frequency of comments on *LinkedIn* to influence the employment seeking process" is below 1.66 that means there is a low significance.

Table 5

Outer weights - Business network sites with the variable trust

Value of the measured indicators for variables of the outer weights to test validity.	Outer weights	Standard Error (STERR)	T Statistics (|O/STERR|)
Trust in SNSs	0.53	0.10	4.95
Frequency of comments on *LinkedIn* to influence the employment seeking process	0.21	0.14	1.51
Frequency of comments on *Xing* to influence the employment seeking process	0.60	0.13	4.59

Source: author's calculations

The result for the loadings values for this indicators are in an acceptable range (Loading value 0.707 and t-value 8.257). The indicator is important to describe the trust variable and to explain the use of SNSs. That is the reason to keep this indicator in the model. The outer weights for private network sites are mentioned below in the list.

Table 6

Outer weights for private network sites for the item trust

Private SNSs	Outer Weights	Sample Mean (M)	Standard Error (STERR)	T Statistics (|O/STERR|)
Trust in SNSs	0.52	0.51	0.12	4.37
Frequency of comments on *Facebook* to influence the employment seeking process	0.61	0.60	0.10	5.77
Frequency of comments on *Googleplus* to influence the employment seeking process	0.28	0.27	0.15	1.80

Source: author's calculations

The t-values for private SNSs are above 1.98 that means that the significant level is 5%. Only the last indicator "Frequency of comments on *Googleplus* to influence the employment seeking process" is below 1.98 but above 1.66. That is a significance of 10% for this variable. That means that the results fulfil the requirements.

The requirement for the discriminant validity is that the "latent variable correlations" are below 0.9. The values are described in table above and there are all values below 0.9. That means the requirement is fulfilled and the validity is given.

Table 7

Outer weights for private network sites for the item support

Private SNSs	Outer Weights	Sample Mean (M)	Standard Error (STERR)	T Statistics (|O/STERR|)
Know the platform *Facebook*	0,45	0.44	0.09	4.88
Facebook support the employment seeking process	0.54	0.54	0.10	5.06
SNSs consult employment seeking individuals	0.56	0.56	0.11	5.06

Source: author's calculations

Multicoleinarity is an important issue for the quality of the construct. The test for this quality is the variance inflation factor. The factor for business network sites is 1.226 and for the private network sites 1.221. Both values are below 5 that means there does not exist any issue for the variables (Farooq, 2016; Fuchs, 2011). The construct can use both variables.

Testing the Hypotheses of the Model

The path coefficient and t- value is calculated with the bootstrapping procedure. The results for business network sites are presented in table 8 and for private SNSs are presented in table 9.

Table 8

Business SNSs - Bootstrapping - Path coefficient between "use of SNS" and items

Path coefficient between variables	Path coefficient	T Statistics (|O/STERR|)
Trust -> Use of SNS	0.322	6.134
support -> Use of SNS	0.376	8.678

Source: author's calculations

The t-values are above 2.57. That means the probability of error is below 1%. The path coefficient and t-value of the private model is listed below.

The result fulfils the requirements for significance as t-values are above 2.57 and that is a probability of error below 1%. That means the hypotheses can be accepted for significant reasons. The business network sites have higher influence with the support variable on the use of SNSs than the trust variable. Private network sites and business network sites have differences.

Table 9

Private network sites - Bootstrapping - path coefficient between "use of SNS" and items

Path coefficient between variables	Path coefficient	T Statistics (|O/STERR|)
Trust -> Use of SNS	0.376	6.502
support -> Use of SNS	0.266	5.133

Source: author's calculations

The trust variable is higher at private network sites than at business network sites. That means the trust in private network sites explains more the use of private network sites. That indicates that there are more trust in the use of private networks than in business networks under consideration of the employment seeking process. The larger gap is between the results for the support variable. That indicates the support at private network sites is not so present if compared with business network sites under consideration of the employment seeking process. The researched indicators values are different and that is an indication for differences in the use of the SNSs types.

Table 10

Business network sites - R^2 adjusted, Source: Authors´ own elaboration

Results for Business network sites	R^2 Adjusted	T Statistics (|O/STERR|)
Use of SNS	0.346	8.974

Source: author's calculations

The value for R^2 has to be above 0.25 to be acceptable. The level of the value R^2 describes the explanation power for the model (Ringle, Sarstedt, & Straub, 2012; Joseph F. Hair, Sarstedt, Pieper, & Ringle, 2012). The explanation of the use of SNSs for the employment seeking process is acceptable that means the variables support and trust can explain the use of SNSs to identify employment opportunities.

The value of R^2 for private SNSs is 0.294 and above 0.25. That means the requirement for the quality of the model is given. The interesting point is that the value of private SNSs is below of business SNSs. This is an indicator that the use of private network sites is not so good explained and predictable as the use of business network sites for the employment seeking process.

Table 11

Private network sites - R^2 adjusted, Source: Authors´ own elaboration

Results for Private network sites	R^2 Adjusted	T Statistics (|O/STERR|)
Use of SNS	0.294	6.095

Source: author's calculations

The prediction power is calculated with Q^2 value. The result for business SNSs is 0.197 and above 0. That means there is a good prediction on a middle level (Ringle & Spreen, 2007). The Q^2 for the private network sites is 0.144 which is a low prediction power. This result has to be under consideration that SNSs have different purposes and network members would use the networks for their purpose.

Conclusions

The results confirm the hypothesis and assumption. The hypothesis has been "If people trust the content of SNSs under consideration of the employment seeking process than they are more intensive using SNSs" and "People who received support from SNSs for the employment seeking process are deeper involved in SNSs". There is a difference between private and business networks. Those differences are the power of the influence factors and the prediction quality of the model for both the business and private network sites. That gives the indication that not any network site is useful for the employment seeking process. The behaviour of individuals depends on the social network they use. The employment seeking process is one situation when SNSs can be useful for individuals. Further research can evaluate other situations e.g. decisions to buy a product. The dimensions of social capital to explain the mechanism in SNSs are confirmed and statistically tested. That means the provided variables support and trust can be used to explain behaviour

in SNSs. The use of SNSs for the employment seeking process is described by the model and the model gives an opportunity to test dimensions of social capital in SNSs. The use of SNSs depends on support and trust from the SNSs. This mechanism can be explained with the social capital theory. That is an indicator that social capital can be used to investigate and explain SNSs. The hypotheses were confirmed for private and business SNSs but the power of the results is on a low but significant level.

Enjoyment and willingness of individuals to use SNSs for the employment seeking process is supported with the survey results. The research helps to understand SNSs and provides important information to organizations. This information is needed to create a recruiting strategy for SNSs. That can improve the employment seeking process to be more successful. That supports the decision to use or not to use SNSs for the employment seeking process.

The use of SNS for the employment seeking process is related to the items support and trust. The human resources management needs information about individual's behaviour to identify employment opportunities. This information is important to create a strategy for human resources management to identify suitable candidates. The different kind of user, intensity of membership in SNSs has an influence on the behaviour of individuals how to use SNSs.

More indicators need to be tested. Future research should consider in extending this model with further indicators. A model to explore social capital in SNSs minimum one more variables because the social capital theory has more than two dimensions. Other research fields can utilise this study to investigate SNSs in different ways and to generalize the results for SNSs.

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CHANGES OF ECONOMIC SECURITY LEVEL IN LATVIA IN CONTEXT OF GLOBALIZATION

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Abstract. Economic security is a complex, inter-disciplinary issue which becomes more important due to the growing income inequality and political situation in the world. Individuals are affected by economic security while planning their household budget. The aim of this paper is to analyse changes of economic security in Latvia in the context of globalization. Authors have done a review of literature on economic security, comparing and analysing different definitions of economic security both at individual and state level. Authors have also calculated the level of economic security in Latvia by various methods based on the literature review. Economic security index for Latvia is calculated using the *Osberg and Sharpe* method and the *United Nations indicators* method. It is concluded that globalization has differentiated impact on economic security in Latvia. After joining the European Union the level of economic security in Latvia has increased, but during the global financial crisis it deteriorated. During the financial crises, the factors impacting economic security negatively were stronger than the ones impacting it positively, but in the years after the crises the situation has slightly improved. This paper contributes to theoretical and practical research of economic security as there have been very few research papers about this topic in Latvia in comparison with other countries. This paper provides first steps to create an Economic security index which would be suitable for Latvia, as the research concludes that the existing methods are not comprehensive.

Key words: *economic security, European Union, globalization, human well-being, Latvia*

JEL code: D63, I31

Introduction

Economic security is a complex issue. All inhabitants of Latvia relate to the economic security every day while planning their household budgets and trying to secure that they have enough money to cover their expenses today and for tomorrow. Politicians also are concerned about economic security while planning and organising different processes to run the country – mainly ensuring that the state has enough financial resources to function (to pay salaries, keep up infrastructure etc.).

There are only a few research papers about economic security in Latvia which does not give a full and global view about economic security of Latvia in a long period of time. Since 1991 there has been only one doctoral thesis about economic security, it means that there is no fundamental background for this concept at academic level in Latvia.

Despite that in the last years the tendencies of economic security in Latvia are changing mainly due to the globalization, e.g. joining the European Union (further – EU). Taking into account the above mentioned, the authors have chosen to research the level of economic security in Latvia in context of globalization.

The aim of the research is to analyse the changes of economic security level in Latvia concerning the impact of globalization. The timeframe chosen for the research are years 2000-2014. To reach the aim authors have set three tasks of the research: analysis of theoretical aspects of economic security, compilation of different quantitative methods to analyse economic security, and calculation of economic security in Latvia using different methods. The research question

is how the level of economic security in Latvia has changed in the context of globalization (after joining EU, during the financial crises, and during the high emigration period after the financial crisis). The methods used are analysis of scientific literature, analysis of statistical data, creating indexes.

There are several restrictions to the research – firstly, the research is carried out for macro and micro level (mezzo level is not analysed), secondly, the data used are for years from 2000 to 2014. This time range is chosen because it is the most suitable to answer the research question and also due to the limitation of available data. Main information sources are different research papers from Latvia and abroad, scientific publications and doctoral theses about economic security, statistical data from EURSTAT, Central Statistical Bureau of Latvia and Central bank of Latvia.

The research contributes to the ongoing studies of economic security in Latvia, mainly to the quantitative research as there are no previous calculations of economic security level in Latvia available (at least not to the authors).

1. Theoretical aspects of economic security

Economic security is an inter-disciplinary term (as it concerns economic science and security) without one specific definition. Economic security is one dimension of security. The term "security" has many different definitions based on the context, level of analysis and aim of the publication. One of the most relevant definitions of security to this research is that security in its widest context is a freedom from threats, a possibility to keep the independent identity of different countries and societies as well as to save their integrity against hostile powers (Buzan B., 1984). Comprehensive analysis of security definition is provided by The Hague Centre for Strategic studies emphasizing that there are 16 main dimensions of security mentioned in scientific literature, and one of the most important dimensions is economic security (Sweijs T., 2012). Economic security is the core of national security system of each state, respectively, all other security dimensions of a state – energetic security, finance security, social security, political security, ecological security, military security etc. – are very close related to and dependent on economic security (Jadčenko L., 2006).

At state level, economic security is a situation when there are no internal or external financial and economic threats which could undermine the state's capacity to provide resources for its functioning, stable economic activity of entrepreneurs and opportunities to maximize consumption. The aim of national economic security is to provide conditions for social and economic growth of the state (Dinicu A., 2010). It follows that economic security is dependent on GDP growth rate, inflation, unemployment rate, direct foreign investment and other indicators.

At individual level, economic security can be defined as a level to which citizens are secured against the risk to get in a situation when they have no income or the income is not enough to provide a worthy living standard (Bonoli G., 2003). There are two aspects of individual economic security on which many authors agree – firstly, economic security means avoiding from very low income, it is an aim to reduce poverty; secondly, economic security is conservation of living standard during economic volatility – during recession, high level unemployment period, during sickness, invalidity or during retirement years (Wolfson M., 2011).

There are different factors which can have an impact on economic security at state level and at individual level. These factors can be seen in Table 1 (economic security can be analysed also on mezzo level, namely, for entrepreneurs, but due to the scope of this research paper the mezzo level factors were excluded from the original table).

Table 1

Factors having impact on economic security

	Macro level	Micro level
Stakeholders	*Countries, international environment, world*	*Individual persons, families, societies*
Crucial factors	• Stability of the state markets, • Free trade, • Competition, • Sustainable development, • GDP growth, • Productivity, • Low inflation rates, • Low unemployment rates, • Stable exchange rates, • Balance of payments equilibrium, • Indebtedness, • Stabile "endowment" with production factors (oil, gas), • Avoiding and reacting to speculative attacks, • Solving problems connected with drugs using, trafficking and criminal groups.	• Stability of state macroeconomic environment, • Food, water, shelter stability, • Lodging, • Job security, stability, • Stabile and "fair" wages, • Trust in institutions, • Minimizing (absolute and relative) poverty, • Minimizing social exclusion (maximize individual reputation), • Education, • Minimizing phobias, • Free movement of individuals, • Avoiding the "magic circle" of living standards and employment.

Source: Udovič B., 2006.

The factors mentioned in Table 1 clearly show the complex nature of economic security. The list of the factors is not absolutely profound, but shows very well the crucial factors concerning economic security. All of these factors can be used to analyse the level of economic security using both qualitative and quantitative methods.

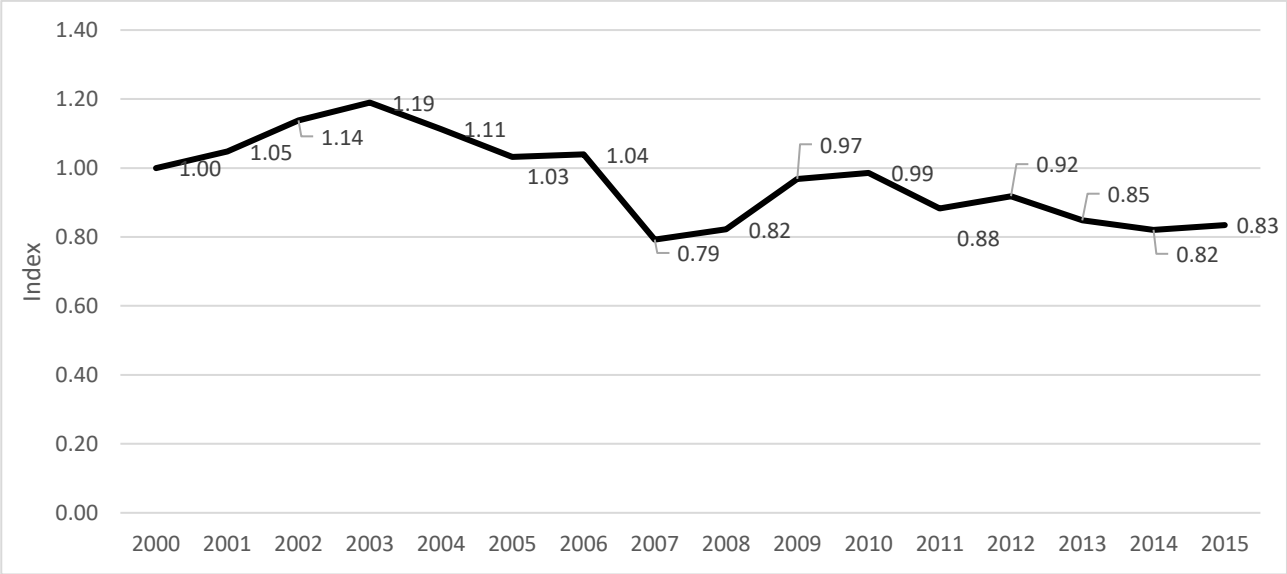
Economic theoreticians consider that the economic security concept nowadays is multidimensional, which is clearly shown in Table 1. Nevertheless, the impact of the government on economic security is reduced because of globalisation processes. Globalisation is now in the centre of the definition of economic security, emphasizing the risk of economic shock due to unpredicted economic crisis as well as the volatile nature of the economics (Kahler M., 2004). Globalization can have both positive and negative impact on economic security. The positive impact is mostly in the form of global sharing of knowledge; global cooperation helps to diversify supply and sales markets; mutual international dependence and integration has a positive impact on nation's security as the military threats decrease. The negative impact can be in the form of negative effects of open borders (e.g. illegal flow of goods, illegal immigration etc.); the global information and transport networks contribute to faster speed of crisis; globalisation opens more opportunities for illegal employment (Kahler M., 2004). The balance between the positive and the negative impact of globalisation can vary at different times, resulting in the changes of economic security.

2. Economic security level in Latvia

To test the theoretical assumptions, the authors calculated economic security level in Latvia. There can be found different methods to calculate economic security level in literature. For the purpose of this research authors have chosen to use two quantitative methods to analyse and calculate economic security level in Latvia as these are the only methods which could be applied for the Latvia's situation so far (e.g. the most popular Economic security index created by Hacker

cannot be used in Latvia at the moment as it is necessary to carry out a specific survey, the same problem applies to other existing methods as well).

The first method is Index of economic security created by Osberg and Sharpe. Osberg and Sharpe argues that in ideal situation economic security could be analysed quantitatively using the following data: how many inhabitants (in percent) have a guarantee for further employment and adequate savings to continue consumption during illness or unemployment periods (Osberg L. and Sharpe A., 2002). As such data are not available, Osberg and Sharpe advice to use available data in four categories: unemployment risk, illness risk, single parents risk and poverty risk during retirement (Osberg L. and Sharpe A., 2011a and 2011b). Based on this methodology, authors have used the following statistical data to calculate Economic security index for Latvia at individual level: unemployment rate, expenses for medicine for one person (in per cents from monthly expenses), number of divorces per 1000 marriages and risk of poverty for people over 65. All the statistical data were standardised (the data for 2005 were equalized as 1 and the following data recalculated against the base year value) and thus Index of economic security was calculated, considering that the value of index is greater, the better is economic security level in Latvia.



Source: author's construction based on statistical data provided by Central Statistical Bureau of Latvia and EUROSTAT.

Fig. 1. **Economic security index of Latvia based on Osberg and Sharpe method**

As the results in Figure 1 show, the economic security level in Latvia has decreased after joining the EU in 2004. The lowest point is in 2007 and 2008, with a slight increase during global economic crisis and very flat decrease after the crisis. The authors suppose that Osberg and Sharpe method for calculating Economic security index is not suitable for Latvia. There are two main reasons why: firstly, taking into account the complex nature of economic security, it is not possible to calculate economic security index correctly using only four factors. Secondly, it is not possible to get all the data that are necessary to calculate the original Osberg and Sharpe index (for example, to calculate the single parents risk, Osberg and Sharpe use the following formula: chance of divorce multiplied by poverty rate of single parent (female) families, which is multiplied by the average poverty gap for single parent (female) families, so the risk of inaccuracy using this calculation method is higher (the authors have replaced this formula with available alike data [1]). In addition to the adequate evaluation of situation it`s necessary to take in mind socio-cultural traditions of family model. Supposing that Osberg and Sharpe model is created for the type of society where the woman are not always exerting their professional

[1] This is not a new approach, as several other authors have also modified the Osberg and Sharpe method, e.g. Hosseini R.M., 2011.

activity (male-breadwinner model of family or parental model of family) – in this case the divorce and the appearance of single parent family can be closely related with poverty risk which is reflected in one of the four elements of Osberg and Sharpe model. Due to the reason that Latvia is a country with 50 years' experience of socialism based on a planned economy, the political system and socio-economic conditions strongly influencing not only the type of society but the families as well. Economically independent woman, exerting professional activity (with or without children) was not an exception but a rule due to the obligation to work. With the changes of the system and the transition to market economy the situation is modified: no more job nor stable salary ensured. Due to this, the females' economic activity in Latvia is still high but they will accept a lower remuneration but a stable job in contrast to males who are taking risky opportunities proposed by market economy to win more. In this way, the chance of divorce (as in Osberg and Sharpe model) will not be so closely related with poverty risk. The situation can be changed during the crisis when the unemployment is rising but contrary to this the economic security index calculated by authors using Osberg and Sharpe model is showing that the economic security in Latvia is only rising during the crisis (2008 – 2010). This is absurd because another element of this model is unemployment rate.

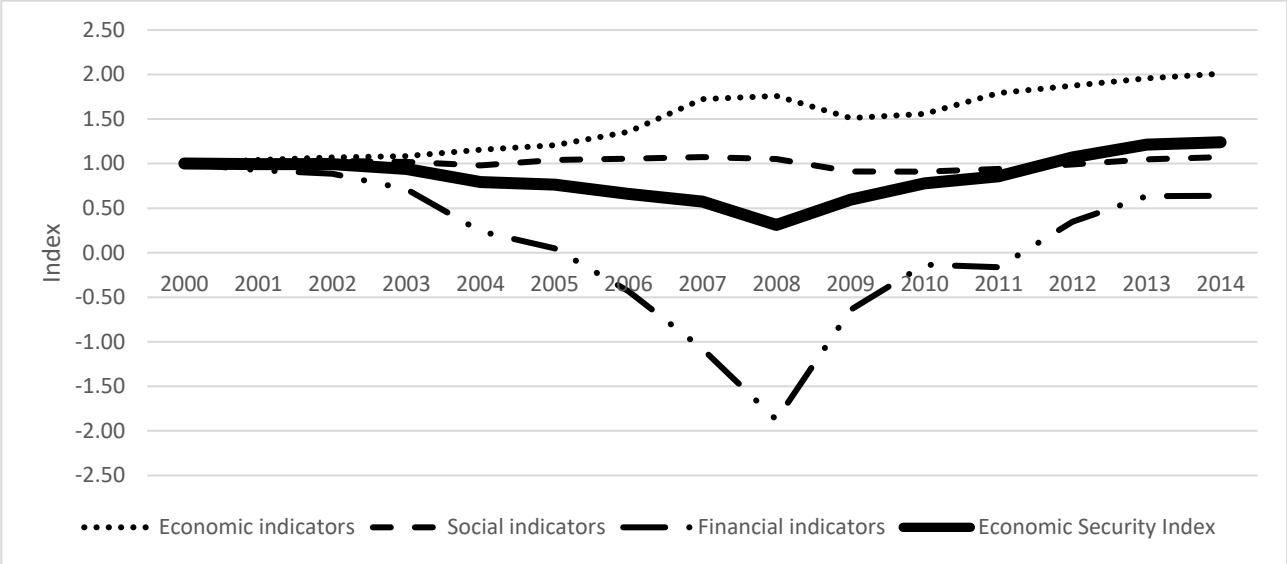
The second method the authors use to calculate economic security level in Latvia is the indicators developed by the United Nations (UN). It is possible to quantitatively analyse and compare economic security level in different countries. These indicators are previously used in Latvia to analyse economic security (though in different context than in this research paper) by Jadčenko L., 2006, and Rozentāle S., 2011. The indicators developed by the UN are divided in three groups: economic, social and financial indicators. Economic indicators are used because they show the ability of the country to function with minimal dependence from the other world. The social indicators reflect the social situation in the country, income equality and distribution of wealth. Financial indicators show the tendencies in the development of state's finance system and the ability to overcome possible crisis. All these indicators can be used to analyse the economic security at state level (as they are mainly macroeconomic indicators). Authors have used these indicators to create Economic security index for Latvia, it is a new approach and have not been used in Latvia before.

Authors have calculated three separate indexes (using the same method for index calculation as described before) for economic, social and financial indicators and then, based on these data, calculated the overall Economic security index for Latvia. To calculate index for economic indicators, authors have used data about GDP per inhabitant, manufacturing share of GDP (in per cents), foreign direct investments (per cents of GDP), and number of innovative enterprises (the original methodology foresees to use data about the share of new products from the total issue, but these data were not available). As shown in Figure 2, economic indicators index is growing steadily since 2000 with a short fall during global economic crisis.

To calculate index for social indicators, the authors used data about people living under risk of poverty (in percent), the life expectancy rate, Gini index (the original methodology foresees to use data about gap between 10% of inhabitants with the highest income and 10% of inhabitants with the lowest income, as these data were not available for Latvia, but the aim of both indicators is to show the income inequality in the country), number of crimes and unemployment rate. As shown in Figure 2, the social indicators index is flat and almost invariable from 2000 to 2015 with a small drop during the global financial crisis. From this it can be concluded that although there is a growth in economic in Latvia, the inhabitants have not felt it yet at micro level. Thus, the government should improve the economic security level of inhabitants of Latvia by different socioeconomic measures (e.g. by increasing untaxed minimum wage, decreasing labour tax, making social support system more effective).

To calculate index for financial indicators, the authors used inflation rate, budget deficit (per cents of GDP), external debt and external trade balance (compared to the original methodology, several indicators are not used due to the

differences in methodology and because they were not available for Latvia). As shown in Figure 2, the impact of globalization to economic security in Latvia can be seen in the financial field the best. The financial indicators index was falling rapidly after joining the EU and during the global financial crisis, but the situation is improving since 2009.



Source: author's construction based on statistical data provided by Central Statistical Bureau of Latvia, Central Bank of Latvia and EUROSTAT.

Fig. 2. **Economic security index of Latvia based on UN indicators.**

The results of the calculations for Latvia split in four mentioned indicators are very doubtable because of several reasons. First, economic and social indicators can be accepted in general but because of the inadequate financial indicators the results of economic security index as a sum of the whole are wrong and contradictory to the reality. Second, the statistical information is showing the rise of economic activity after joining EU - growth of GDP representing +12.2% in 2006, +10.3% in 2007 (Central Statistical Bureau of Latvia), increase of wages due to the rise of real unit of labour costs (the changes are estimated approximately 25% points in 2008 compared to the level of 100 for the year 2004) (Eurostat). Opposite of this, the economic activity was declining during the crisis – the fall of GDP (-4.4% in 2008, -17.7% in 2009, - 0.9% in 2010), decrease of manufacturing by –22% in 2009 and of construction by –38.0% in 2009 and by –35.4% in 2010 (Central Statistical Bureau of Latvia). Those figures have had a big impact on the estimation of economic security in both cases. Third, in the situation of crisis reduction of production and bankruptcies of enterprises, following dismissals of labour force both in private and public sectors, diminishing of salaries which influences the consumption, which then influenced the demand of services and services sector in general are the factors which cannot be favourable for economic security. In the case of Latvia, financial situation was not favourable due to the foreign debt because of need to ask for the aid from IMF and EU (macro-level) and insolvency of enterprises and households because of inability to pay the mortgage loans which are provoking significant losses for banks (micro-level). For this reason it is not understandable why there is a rise of financial indicators in calculated economic security index just for the year 2009 - which was objectively the most difficult for Latvia - and why there was a fall of the same financial indicators for the favourable period after the adhesion to EU when foreign debt of Latvia was third lowest in EU representing only 9% from GDP in 2007 (Eurostat). All those mentioned aspects are showing the limitations of the method.

As mentioned before, authors have compiled all three separate indexes in one – Economic security index of Latvia. This index tends to decrease after joining the EU, reaching the bottom during the financial crisis in 2008. However, the index shows that the economic security level in Latvia is increasing after the crises, and has even exceeded the base rate (in 2000) in year 2012. Nevertheless, the high emigration due to search for higher economic security must be considered as well. During 2000-2014 around 260 000 inhabitants of Latvia has emigrated to other countries, which is around 10%

of the total population of Latvia (in 2000). One of the most common reasons why people emigrate is the seeking for a better life quality and higher level of economic security (Hazans M., 2016).

To reduce the negative economic effect of the emigration, the government should improve the state's economic, social and financial environment. The economic environment can be improved by increasing the support to entrepreneurs (e.g. business incubators, priority fields, tax discounts), the social environment can be improved by reforming the social support system, decreasing labour taxes and increasing the minimum wage; the financial environment can be improved by decreasing the role of the banks in financial field, educating individuals about finances (especially crediting) and by adjusting the normative regulations on crediting institutions.

Authors conclude that this research method is suitable for Latvia's situation but could be improved by further research, adding new variables to create more trustable index which would reflect the real situation in more depth. It also follows that it wold be necessary to continue the research and analysis of economic security in Latvia in different aspects (e.g. at regional level, for different societal groups etc.). This kind of research papers could help to identify the possible problems and help the government to create a corresponding economic, social and financial policy. It is also necessary to create a comprehensive Economic security index for Latvia, improving the methodology developed by the UN. This would help to analyse the level of economic security and evaluate it more precisely.

Conclusions

During the research authors have come to several conclusions:

1. Economic security is a complex issue but there is no common approach in analysing and researching this issue. There can be found different theories and methods how to analyse economic security in scientific literature, but these methods usually cannot be unified and used in all countries.
2. There is a limited number of research papers and analyses of economic security of Latvia. This is a free niche for new research proposals and creating research methods specifically for Latvia.
3. The globalizations processes have a diversified impact on economic security in Latvia depending on their intensity. The processes having negative impact on economic security are usually stronger than the ones having a positive impact.
4. Joining the EU has more positive impact on the economic security in Latvia in economic and social sphere, but more negative – in financial field.
5. The global financial crisis in 2008-2010 has left a negative impact on economic security in Latvia. Individuals as the smallest part of society are more vulnerable to globalization processes compared to the states which have at least minimal tools to correct this impact.

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MEGA-PROJECTS OF THE PUBLIC SECTOR: A GUIDELINE TO AVOID LOGICAL FAILURES

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Abstract. Increasing flood events affect our daily lives, damage houses and infrastructure as well as harm persons and industries. Densely populated and industrialised areas call for better protection against such natural disasters. The public sector is tasked to plan, provide and maintain according facilities as part of the services of general interests. This article analyses critical success factors for realising flood prevention projects by interviewing four experts who explicate their experiences of recent projects. Finally, this knowledge is aggregated and visualised into a systematization that serves as a guideline for responsible institutions. The findings may be used to assist during future projects to avoid logical failures and ensure their successful realisation.

Key words: *Critical Success Factors, Flood Prevention, Knowledge Management, Knowledge Retention, Public Sector*

JEL code: H43 (Project Evaluation), D81 (Criteria for Decision Making), D83 (Information and Knowledge)

Effects of Climate Change on Metropolitan Areas

Due to climate change, extreme weather situations of the last decades will occur more frequently and will be more and more disastrous as statistically forecasted. Especially floods due to high water of rivers influence our daily lives (Kron 2013) and create immense financial losses (Stern 2007). These harms cover personal injuries and damages at buildings, inventories, infrastructures as well as value chains of trade and industry. Areas with the risk of floods are intensively used because of locational advantages of densely populated metropolitan areas. These require the usage of every developable area and demand a compensation of beneficiary and protective interests (Beckmann 2008).

The EU Floods Directive (2007/60/EC) assessed the risk for floods for the first time. It maps potential areas and their location, land-use, risks and consequences for humans and their economic activities. The possible subsequent risks and harms show the necessity to implement efficient flood prevention urgently (Kuhlmann und Becker 1995). In the context of municipal services of general interest and its immense high investment and maintenance costs, the public sector is mostly responsible for building and operating such facilities. However, several lighthouse projects show massive delay and financial deficits in planning and realisation because of diverging interests in law, administration and politics.

A big German water board serves as an empirical example for this research. As its goal, it had the sovereign state planning but only a small part of the overall planning had been realized. The water board was initially intended to be the biggest water management organisation in Europe at that time. It is located next to one of the biggest European metropolitan areas and hence, faced with continuous growth in demands because such metropolitan areas require both a maximum security of energy and water supply and the protection against floods and heavy rain. The overall state planning was based on a water management framework of 1961. At that time, a growing economy and subsequently rising water usage by demographic growth and a higher gross domestic product was forecasted. With a total investment of up to 900 Mio. DM (about 450 Mio. EUR) – therefrom 300 Mio. DM (about 150 Mio. EUR) for drinking water production and –transport plus further 600 Mio. DM (about 300 Mio. EUR) for flood prevention – one of the biggest municipal mega-projects in water management after the Second World War started in Europe. The planning of the water board intended the exploitation of water resources in the neighbouring uplands and drilling of the necessary water wells and building of

conveyor pipelines therefor. So more than 60 Mio m³/a of drinking water were to be extracted. But because of a considerable number of obligations, massive protests including militant attacks against the resource usages for the metropolitan area, significant delays and immense financial overruns occurred.

On the other side, flood prevention was the second task of the organisation. It was charged with the protection of the residents alongside the river as well as the water level regulation. So, in three construction phases several dams and retention basins should have been built. The first phase included two big dams, one retention basin with permanent backwater and two flood protection facilities at large cities. Two more retention basins were added afterwards to optimize the water regulation. The second and third construction phase contained another seven retention basins on the inflowing streams. The realisation of each phase was planned to last one decade each.

At the end, only one dam had been realised with costs of 72 Mio DM (about 36 Mio EUR) in 1987. 95% of the investment was funded by the federal state. Unfortunately, this dam can only regulate 30% of the total drainage area and thus, can just perform a partial protection role. All rivers discharging downstream of the dam cannot be regulated and thus, cause disastrous flooding at increasing occurrences and without any advance warning time. Hence, a current state project assesses the abovementioned locations and plans and - as is appropriate – intends to realise them according to up to date scientific standards.

Currently, an interdisciplinary approach for systematizing the knowledge of successful realisation of comparable projects is still missing. Consequently, projects of flood prevention are repeatedly delayed and thus, cannot protect citizens, valuable infrastructure and also not the economic value added. This research should explicate rationales for critical success factors that prevent failures of the new projects best possible. It should ensure a realisation of the necessary flood prevention plans and provide a basis for new flood prevention approaches.

Research Design

This article is part of a cumulative PhD-Project that deepens the findings of a previous article. Thus, it serves as part of an extensive research project on the public sector for retaining the knowledge of former decision makers and experts. The objective is to externalise their knowledge (Probst et al. 2006, 123 ff.) to treat it practically relevant and systematize it for future usage. The research goal is to gain an insight to situational and temporal contexts which influenced the past decisions on implementing flood prevention projects. The basis is a previously conducted document analysis on documentations of the abovementioned organization whose mega-projects failed in the past (Scheffler und Rietze 2017). After some decades, further mega-projects are about to follow now and the new plans should benefit from the lessons learned (Probst et al. 2006, 133 ff.) to deduce critical success factors (Daniel 1961) in order to ensure a realization this time. The superior goal underlying steps should be explored by the following research questions (RQ):

- RQ1: Which reasons aborted the projects?
- RQ2: Do the reasons depend on each other temporally?
- RQ3: Why did the projects finally fail?

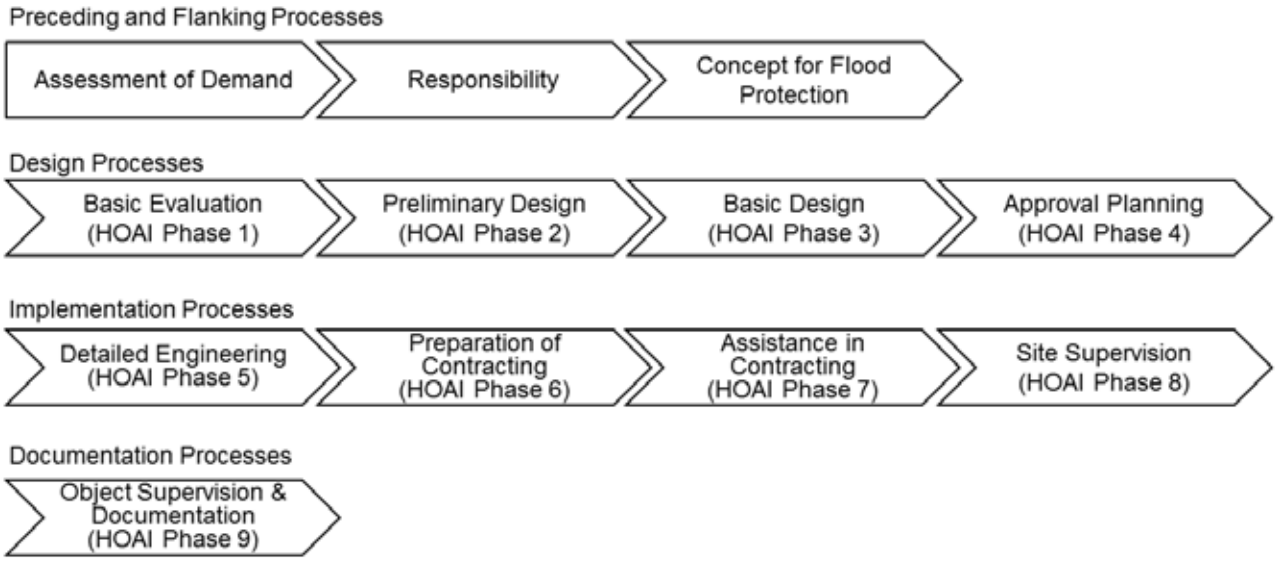
To answer these questions, we conducted four semi-structured interviews (Döring und Bortz 2016, 358 ff.) with experts of distinct stakeholders. Therefore, we questioned 2 former CEOs, 1 chairman, 1 official of a state authority and 1 external engineer. The selection of the polled persons allows a multi-perspective insight into the involved participants. Even if we have to consider a subjective bias due to the small number of interviewees, we can eliminate a distortion from solely considering representatives of one stakeholder. So, we applied a triangulation of methods (Flick 2008) to supplement the findings of the completed document analysis. The four interviews took from 30 up to 90 minutes. If the interviewees agreed, they were recorded and transliterated afterwards (Döring und Bortz 2016, 583 ff.). Two participants did not affirm to a literal recording, so notes were taken during the interviews and complemented afterwards as far as

possible (Döring und Bortz 2016, 362 f.). Next, the transcripts and the notes were analysed regarding their content to extract the central aspects (Mayring 2010, 15 f.). Accordingly, the below listed citations derive from the transcripts and the notes taken. In both cases we slightly edited the texts for better legibility.

After we outlined the context in the previous chapter, the research design was explained. Next, we shortly summarize the findings of the document analysis and eventually answer the research questions based on significant examples of the interviews.

Process of Mega-Projects for Flood Prevention

To create meaningful findings, we firstly analysed the individual steps of such projects. As a result, we achieved a process overview that is split into a pre-, main- and post-phase. The pre-processes typically occur after a flood event when houses, infrastructure and industrial sites are damaged. Residents and politicians become emotionally active, claim better protection mechanisms and provide immense funding quickly. That serves as an ideal scenario to start projects. Alternatively, a preventive scenario could also start these planning. Municipalities identify the risk of floods or the necessity of protection due to disasters in other areas or based on the European Water Framework Directive that provides a suitable basis to act rationally.



Source: author's construction based on Scheffler & Rietze, 2017

Fig. 1. **Phases of a flood prevention project**

After the initial actions a responsible organisation has to be charged with the task to assess flood prevention concepts and start to plan and realise them. Then alternatives are evaluated based on costs, nature and protective demands. They serve as a basis for more specific plans after the decision maker have decided whether to continue or not. If the plans are accepted, the nine process steps according to the Fee Structure for Architects and Engineers (HOAI) have to be passed. Basic information for the implementation has to be analysed before a final design can be approved. To realise it the contracting and contracts, the funding and the operational rules of the facility have to be determined afterwards. Finally, the documentation has to be completed that serves as a part of the operational licence and the basis for guarantee and warranty.

To identify in which process steps the plans failed, we examined and selected documents and plans of the last 54 years in the archives of the organisation, the municipalities, the administrative district and the state authority. Finally, we conducted a document analysis on these materials based on the process steps as categories. Herein we prepared a valence

analysis (Mayring 2010, 15 f.) in order to rate positive, neutral or negative sections of the texts. We found out that only one project was realised and all others failed at nearly the same process step. We also saw that in the time before all projects proceeded similarly until HOAI Phase 4 which is the relevant step for the design approval. Based on technical documentations no indications for failures could be found, but suddenly one project was deferred, one failed due to a nature reserve, two were stopped to find more effective locations and one due to massive objections as well as one because of problems with soil mechanics. At the same time the funding for all projects was cancelled, so further investigations could not be conducted because the water board could not finance the projects on its own. Hence, the reasons for the failures of all projects seem to be geological or hydrological.

But because the information is based on a rational documentation, we have to consider a bias because we could not find any explanation why the state government cancelled the funding and why the reasons occurred that suddenly. In consequence, further investigations with the involved individuals are required to get an insight into the contexts and real origin of the problems.

Guideline for future Projects

Based on the findings of the document analysis on ministerial edicts, commitment on funding's, decrees, notices, protocols and scientific, technical and juristic expert opinions and objections over a period of more than 50 years, now interviews will detail the findings by exploring the context at that time. By clarifying the research questions, we will now illustrate the results in detail.

RQ1: Which reasons aborted the projects?

Referring to the existing research findings the projects failed due to hydrological, geological and nature protective reasons together with a missing funding for further investigations. The experts explicated which factors additionally influenced the progress of the projects:

Length of projects: The overall time needed brings also changes in politics. A normal flood preventive project lasts more than 10 years, so we have at least 2 governmental election periods in Germany at state, county and regional as well as municipal levels and thus, the risk of changes in politics. Depending on their particular interests in civil protection these changes may cause failures. At the same time the time lag to the previous flood influences the central motivation to realize flood protection schemes. Hence the public can change over the time and prioritize public projects differently. Because of permanently tight budgetary situation of municipalities such long-running projects fail frequently.

„Planning periods of such dimensions take as a general rule more than 10 years. Consequently, the public services have to be cross-party and hence, stable over multiple legislative periods."

„The golden reins of the state government[1] decide the duration and speed of mega-projects, like the Airport Kassel-Calden (200 Mio. €)."

One Interviewee also stated that the project was no longer contemporary and politically outlawed. In consequence, the duration of projects has to be shortened to one legislative period at maximum. So, the risk of political dissent could be minimized and a political majority is sure. One approach to shorten the planning period is the alignment of the HOAI or

[1] that is elected for 5 years (annotation by the Authors)

the legal regulation on facilities of special protection compared to military installations. Right now, shorter planning periods can only be found directly after disasters with limitations to the affected region.

Planning certainty of projects: To organizations in charge, financial as well as political certainty is central to project planning. In order to provide a politically secured context, planning periods within a legislative period would be an ideal step. At the same time optimizing the financial funding can only be achieved by a lead through the state. The state with its technical departments can provide its expert knowledge across river basin districts and focus on long-lasting horizons. This solution would also bring lower project and operation costs compared to isolated projects of adjacent cities and municipalities. These may become obsolete through integrated cross-regional coordinated plans.

„Such mega-projects are just possible and can be realized if participants engage in it by law and regulations. The state has to act in its function as a controller. The financing of such projects should be supported by state funding. Furthermore, its economical meaningfulness has to be ensured."

„Edicts by the ministers on financial funding of such mega-projects of up to 95% by the state at that time feigned the executing territorial authority's financial planning certainty. But they only had binding effects within an authority. Result: Changes in the edicts due to a changing government and their subsequent changes in the strategy."

„Ensuring funding beyond politically influenced legislative periods is a guarantee for success."

Until the ideal situation will be reached, the organizations in charge for realizing the projects should ensure a successful realization by making the remaining project steps in the future safe by bonds or official resolutions of the state. So, failures because of changing cost-effectiveness considerations or missing funding can be prevented.

Risk of shifts in political directions: Political power is based on the will of citizens that developed over years and finally disembogues into democratic elections of officials for the upcoming legislative period. The officials elected then steer their actions focusing on their political target. A political shift e.g. based on emerging awareness of nature protection, like in the 1980s in Germany, new political players and governments brought a new focus on nature protection and sustainability compared to the years before. This caused according changes in existing and upcoming plans, their implementation and eventually also their funding.

"Political intent will support a mega-project in the public sector if it serves as procurement for majorities. Massive resistance against successful projects change all rationality."

"If political intent is combined with public opinion then costs are secondary and negligible."

"The country has to be independent to political drifts and instead has to act and decide on demand, on economic principles and for securing the future of its citizens, i.e. services of general interest in the public sector."

"Regulation authorities normally work politically neutral. But an increasing public transparency and contributing NGOs can put them into focus of politicians who have an own political interest. Thus, both may block each other."

Reduce dependency on political individuals: Politicians mostly correspond to changing political directions in the people's opinions. This is influenced by the activities of particular politicians who act on personal and subject-specific

convictions but also on political objectives of third parties like coalition partners. So, powerful network driven politicians can force mega-projects against massive resistance. This applies at the same time also for the possibility to fail.

"The end of political careers or the change of governments can also cause the end of a mega-project. They ask: Actually, do we need this any longer?"

"The mind-set of elected officials is mostly oriented on public opinion and not totally rational. Officials with high rationality are important but rare."

"Political dependencies of persons can only be covered by a broad network. It has to be served equally to optimize the security of projects."

This calls for an identification of central players to increase their consciousness on flood prevention and feed them with adequate information. Not least, managing a network can form opinions of independent individuals and at the same time within groups to guide decision processes.

RQ2: Do the reasons depend on each other temporally?

A dependence between isolated factors results from the basic plans and the overall water-management planning by the state. All detailed plans were components of these overall planning with the objective to optimize the flood prevention and protection of a river basin district of 1000 km². The resources necessary therefor were prioritized a priori and served as a decision base for the board members of the organization.

The long-lasting process of planning, increasing costs, change of political majorities and a nature protective approach on sustainability, as well as missing flood events and concurrent usages caused a loss of the projects image. These factors were discussed by the board members within the organization committees but also publicly in the media. Subsequently, the public and the political acceptance of the overall project got lost.

RQ3: Why did the projects finally fail?

As we already mentioned, the projects did not continue due to a revocation of a previous agreement to provide funds. Thus, the own share of financing for ongoing planning costs was tripled. Furthermore, new projects did not achieve any state funding within the next ten years.

The interviews explicated missing flood events as one reason that raised the question of principal demand under the conditions of the investment costs. Likewise, a changing awareness of the citizens made the projects unconvertible. Increasing considerations of nature-protective aspects had outdated permanent water reservoirs initially planned and storage levels of up to 50 m. In conjunction with the common urban-rural-conflict supported by the media, the political shift and the cancelled funding all remaining projects had to be stopped eventually.

After answering the research questions 1 to 3, we combine and visualize them in Fig. 2. Herein we can see which factors do exist in a flood prevention project and how they are connected to each other to influence the realization of a project.

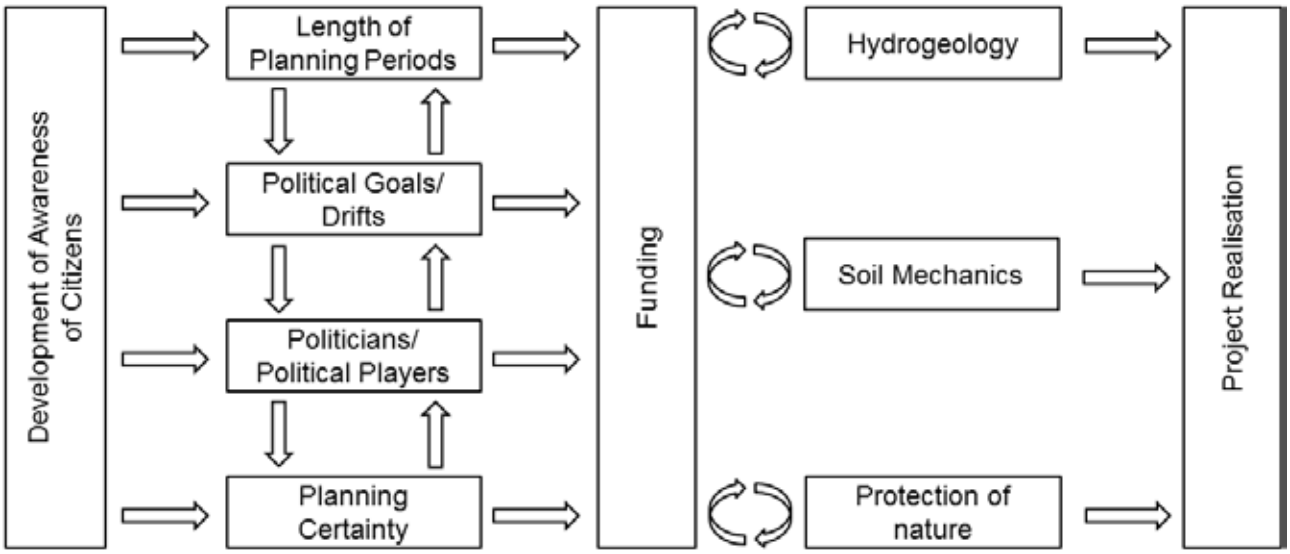


Fig 2. **Dependencies of critical factors for a successful realisation of projects**

Based on an increasing awareness of the public together with flood events, such mega-projects for flood prevention can be justified. After the necessity is accepted in the context of services of general interest and the political players become responsible, concrete organizations are charged to implement and regulate the projects. Therefore, a planning certainty is needed that is backed by political officials, so the objectives of such organizations in protection of humans and infrastructure have to be aligned to the political goals of the appropriate players. Politicians are elected for a term of office and only can realize their goals therein. So, one major determining factor is the political term that directly corresponds to certainty in funding which serves as the most relevant precondition. In times of empty public coffers the financing can only be shouldered with a third-party funding by the state. Upon this, the technical realization may be implemented and challenges in nature protection, soil mechanics and hydrogeology may be faced successfully.

Recommendations

The world's climate is changing and humans move near metropolitan areas that are mostly located at rivers. Our daily lives happen in such densely populated areas and floods or other natural disasters imply massive problems for all residents, the industry and infrastructure. The increasing occurrences call for better protection by implementing flood prevention projects. Unfortunately, such mega-projects create high costs but fail frequently and thus, cannot reduce the risk of damages and harms.

This article investigated factors to be considered when running public mega-projects. It addresses the call on more research on knowledge management in the public sector and, at the same time, concentrates on services of the public sector that are relevant for the overall security (Massaro et al. 2015). Based on findings of a previous document analysis, we interviewed experts of a concrete organization. They participated as decision makers, representatives of the regional authority or external partners and provide a multi-perspective insight into the entire planning process. Questioning them enables us to model decision processes in the public sector. Based on their experiences we identified major aspects that are critical to a successful realization of public projects. In consequence, we can conclude that such large undertakings are faced with challenges at various levels. Beyond the rational criteria of soil mechanics, hydrogeology and nature protection, the funding is the most critical part that decides whether to stop or continue such projects. The funding has to be ensured over the project's entire life time. Therefore, we have to shorten the length of projects in order to avoid possible changes on political levels. It is important to base projects decisions on a broad network above individual politicians and

parties to achieve a certainty for planning. And actually, raising the awareness of the public on risks of floods is the necessary condition to sustain the project's success.

Further need for research is the generalization of these findings by evaluating their validity. The current results are basically biased by project experiences of one concrete organization, thus it needs a regional and time independent analysis whether to confirm or change the success factors. Furthermore, transferring the contexts to other scenarios than flood prevention may create intelligence for the overall public sector.

Processes for implementing projects of flood prevention are challenging steps for municipal sustainability and services of general interest. A failure becomes concrete and identifiable when it causes damages and harms. We can reconstruct where theoretical politics are converted into decisions implemented or where they were postponed due to other reasons. Eventually we have to address the factors identified to reduce the risks if we want to avoid failures of public mega-projects.

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INFORMATION RISK MANAGEMENT vs. DAMAGE PREVENTION AND CONTROL MANAGEMENTS OVER-COMPENSATION IN STRATEGIC DECISION MAKING

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Abstract. The field of Information Risk Management as a sub-discipline of Enterprise-Risk-Management theories is in a constant change. This change is triggered by the dramatic ongoing changes in the computerized information management capabilities. This article examines the different perception of experienced Midlevel Managers in comparison to Information Risk Professionals in particular in the area of damage-control and damage-prevention. It will be figured out, that Mid-Level-Managers put too much focus and resource into damage-control and damage-prevention – as a defensive view – where as other IRM-factors are perceived with to lower focus – mostly those with a more strategic and opportunistic gender. This article examines, why in Management Theory as well as in Organizational Theories the Information-Risk-Management discipline needs to be considered through the whole value chain as a separate value adding process and function. Esp. managers in middle management are exposed to this area risks, but might get into a conflict of interest between performing the required Information Risk Management actions against showing a high cost-benefit. In a lab-in-the-field experiment on the one hand 10 Information-Risk-Management-Experts were interviewed on their perception to what extend IRM-Damage-Prevention and -Control influences Strategic Decision Making (structured interviews). On the other hand, those results are compared with 131 Professional Business Managers perception (structured questionnaire) based on an introduction training on Information Risk Management.

Keywords: *Decision Making, Enterprise Risk Management, Information Risk Management, Management Theory*

JEL code: *C01, D81, O33*

Introduction: Hypothesis and Expected Findings

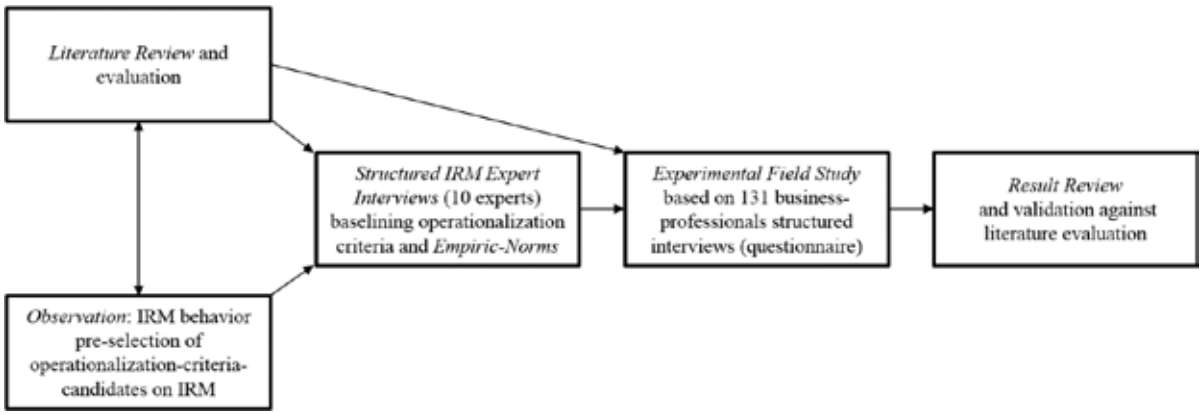
The central point of this research work was based on various observations in midsized and big enterprises in various businesses around the globe. It was observed, that "Information Risk Management" is not seen as a serious factor for business success esp. in the day to day decision making processes at the average "mid-managers" level. But on the other hand, IRM is seen as getting fast increasing relevance in the more and more developing information technology ages. So, the Hypothesis was formed as:

H_0: There is no difference in perception between IRM Professionals and Midlevel -Managers of the correlation between *IRM Information Protection and Information Control* and *Improvement of Strategic Decision Making in Damage Prevention and Control*.

Research Methodology – Results' Validity

As this research work opens a new field, basic scientific work has to be performed. First a theoretic model has to be developed and proven. On this model an empiric-norm has to be derived from, to have a baseline to measure further results against this empiric norm, to identify similarity or deviations when real-world data is collected. In a last step, the reasons and rational have to be examined and ex-filtrated per scientific area, e.g. organizational science, psychology, management science etc. Finally a first practical implication will be given.

In a first step a new model – the Five-Method-Mix – needed to be developed, see Figure 1. This is a combination of basic scientific methods that are combined in a structured way to guarantee scientific meaningfulness of the results – independent of result-values themselves.



Review variety of potential impacting scientific fields, socio-, psycho-, economical-, statistical fields

Observation of current standards in business organization, common practices, threats, developments, trends.

Check obvious correlation between observations and scientific literature

Identify potential discrepancies between scientific theory and business organization practice

Identify requirements on scientific methodology and approach

Collect operationalization criteria/items for modelling exogenous- and endogenous variable-measurement items

Discuss / confirm observations and literature research findings

confirm basic need of investigation in topic

confirm chosen exogenous variables for causal model

rank exogenous variables/ operationalization items for *IRM side* of model

generate *Empiric Norm* for exogenous variables for later testing

With case-study introduce basic definitions, tools, approaches and meanings of IRM

Recap basics of decision-making theories

delimitations from IT-Security

question *all concatenations* of exogenous- and endogenous variables measurement items

reach statistical significance level of returned questionnaires

Test results against the *statistical norms* from previous expert interviews

Prove / reject main theses

Interpret results

Critical contextualize results with current state of research

Identify confirmations and potential further correlations

Identify objections / restrictions / limitations to existing models & theories

Identify practical implications and suggestions for business organization

Source: Author's compilation

Fig. 1. **Five-Method-Mix – Scientific Approach**

Of key-importance are the 3rd and 4th step, the *Structured IRM Expert Interview* and the *Experimental field study*. The primary goals of the IRM expert interviews therefore are to achieve three goals: (1) Confirm the 4 pre-chosen Variables characterizing solid Information-Risk-Management holistically in the light of decision making improvement (qualitatively) (2) allocate and confirm measurement items (operationalization) for the latent exogenous variables qualitatively, and (3) generate an empiric norm for the further investigation steps (quantitatively) (McKnight et al 2002). In summary

10 *Information-Risk-Management-Experts* were interviewed in personal F2F interviews. The selection of IRM Experts was conducted on their publicly known professional experience and career. In the interviews the confirmation about the used terminology was done verbally at any stage of the interviews to ensure high data quality and preciseness. The limitations or critics of this concept are examined and the reasoning is given as well to prove overall validity: Purely statistically seen, the number of 10 responses as such does not give a representative base for any further statistically calculation or quantitative analyses of the results– in general, it might indicate the direction only. In this particular case intentionally only *IRM-Experts* are interviewed. In methodical review, expert's statements have to be seen as valid. The used statistical approach helps to bring this question on a broader scale of knowhow and enables to rank the variables amongst each other and to give an Empiric-Norm for further testing. Resulting, it could be claimed, that the expert's review/replies are valid per definition and that the statistical approach of generating the mathematical mean out of 10 interviews has to be seen as a representative calibration of expert's views. Further on, the results on the measurement variables are not ranked amongst each other (no *load-factor* was generated out of the answers) – here also the pure statistical possibility is given, but as this is not required intentionally (methodical design setup) for the further investigation the to not open the question on a hypothetical validity of these load-factors.

For the experimental field study the author decided to choose the attendees for the field-study only out of experienced Business Professionals intentionally to avoid any implications, limitations, and discussion or weakness in the result pointing back to the question of similarity of answers of different groups or even young students with less business experiences. In fact only experienced post graduated participants of MBA- and Doctorial Programs with multiple years of business experience and an economical background were selected. The selection method across those program participants also guarantees an organic spread of various industry for which attendees work for. The single personal identifying information such as names, company names, birth date, etc. are not tracked, as this is of no relevance in the current model and would expose to potential data privacy risks. The total number of questioned Mid-Level-Managers is 131.

Each of the session was budgeted with about two hours in total, in particular ten minutes of introduction, twenty to thirty minutes of reading the case study, about ten minutes of question and answers, and about one hour for filling the questionnaire. After returning the filled questionnaires in some cases a short discussion was initiated by individuals, but not monitored or considered for any further analysis.

Developing a New Model to Measure Information Risk Management in Strategic Decision Making Context

The initial question on how to measure the quality and characteristics of "Information Risk Management" mechanism, a choice of several operationalized measurable variables and indicators were preselected based on a broad literature research. In essence there are two focus areas to look into

1. Human Factor – Social and Psychological Research

2. Methodical/Technical Factors – General Risk Management Research

In the area of Social- and Psychological Research, which describes the perception and the behaviour, the "buy-in" theory of participation in IRM contexts associates' user acceptance with users' psychological involvement that develops during their participation. In other words, as users participate in IRM activities, they begin to view the focal system as personally important and relevant, and are therefore likely to be more accepting of the system than they would otherwise be had they not participated (Power, D.J. 2008). On the other Hand John D'Arcy (D'Arcy J., 2015) describes situations

where security requirements increase workload for employees and, as a result, create added time pressure for them to complete job duties. For example, employees who do not have administrative access to their work computers may have to spend valuable time completing paperwork and waiting for an IT professional to install needed software or download needed materials. As a result, employees have to work harder and faster to compensate for the overload caused by this security requirement. These conditions are known causes of frustration and stress Employees have also lamented that many security requirements force them to adapt their work procedures (e.g., not sharing passwords with co-workers), which can be stress inducing.

As a first interim result the real of IRM-"AWARENESS" of the employees could be seen as one of the key indicators of IRM as such – This includes not only the theoretical knowledge of IRM at all levels of the organization but also the willingness to follow combined with a proactive "all day" attention.

Methodologically/Technically, holistic Risk Management consists itself out 3 steps:

1. Risk Identification – Information Classification (Spears,J. 2010)

2. Protection of Risk-Areas

3. Active Controls of Risk-Areas (Schulz et al, 2013)

In mid-sized and big enterprises the effective implementation of Standards and Controls is key for any kind of compliance reporting done by internal and external auditors (Pfeiffer et al 2010). When responding to a specific business risk, an auditor has to search for relevant and reliable audit evidence and list the accounts and assertions to test in response to that risk. Cognitive research has found that experts / specialists have more complete knowledge and memory organization than novices have a more complete problem representation, which they bring to an unstructured industry task (Wagner et al. 2010). IRM was over a long time a not structured task. In the beginning a holistic view on all Information Assets needs to be in place to further classify and segregate the "important to look at" assets from the irrelevant. Further on an appropriate protection of this information assets need to be established as well as an "over time" controlling" of these security measurements.

In a first round 10 independent IRM Experts were personally interviewed in a structured method along a Likert-5 scaled (it was explained that the underlying distance of each sector is assumed 20% of the range which equals "linear") questionnaire to validate the validity of the measurement variables and also give the EMERICAL NORM for the second evaluation later on. Both criteria were highly accepted (and 2 further, which are not part of this article) and seen as THE measurement criteria for the quality of IRM.

It could be shown, that the average mean and the normalized mean are

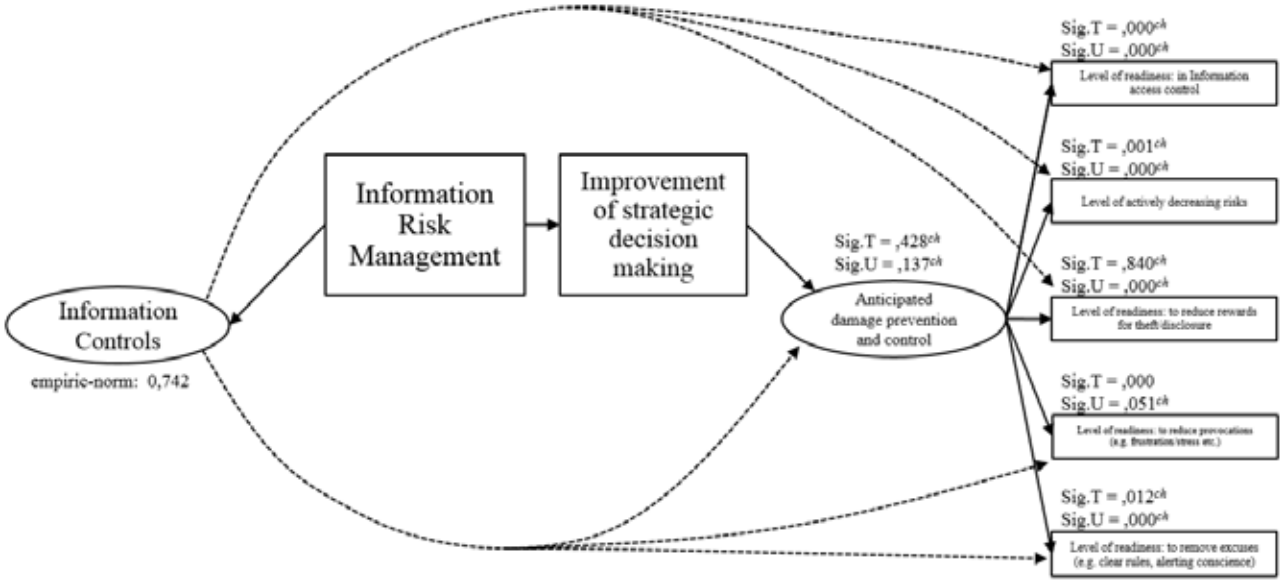
Table 1

Expert's Interview Resulting IRM Measurement Variables' Mean

Variable	Empiric Norm
Information Protection	**0,816**
Information Controls	**0,742**

Source: author's calculations based on structured IRM-Expert Interviews in Phase 1

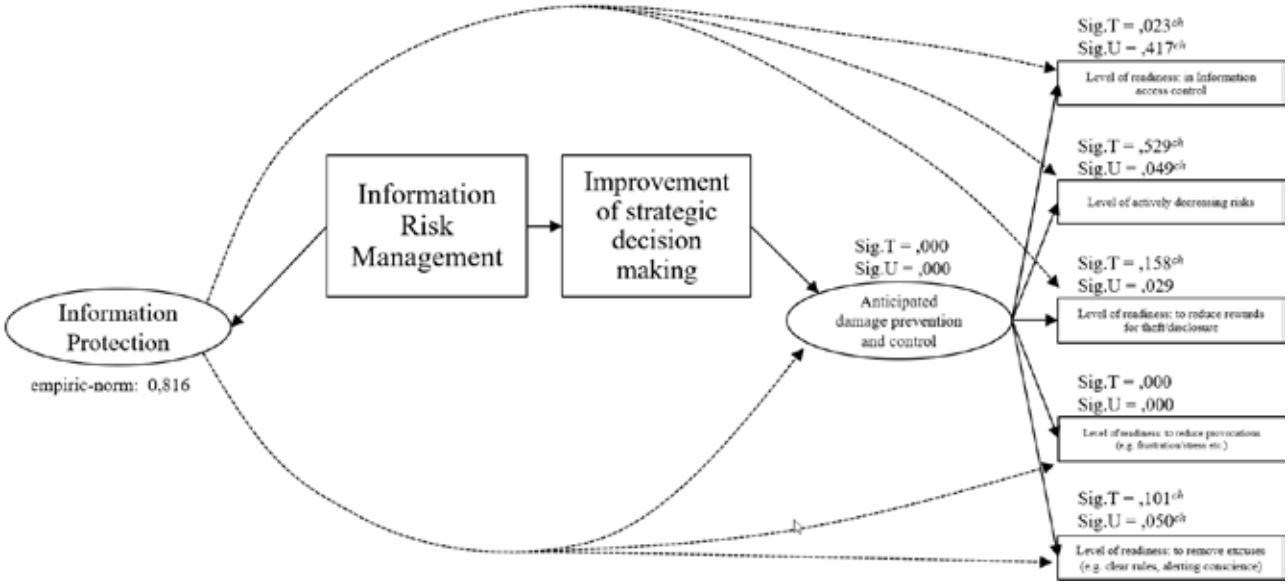
The resulting proposal of the causal model to be tested could be shown as following 2 figures – both figures do already show the test results of 2 test methods used and examined later on and includes the setting of the applicable endogenous variables derived from a broad literature review.



Source: author's construction based on Literature research and structured IRM Expert Interviews

Fig. 2. **Causal Model 1**

Figure 3



Source: author's construction based on Literature research and structured IRM Expert Interviews

Fig. 3**. Causal Model 2**

Scientific Design / Methodology

In a sample of 131 business professionals (mid-level-managers) the referenced model was tested – see figure 2 and figure 3.

As Information Risk Management methods are not obvious and therefore not very well known in the community of average mid-managers, a "Case Study" was invented to give the full spectrum of possibilities from "doing nothing" up to "doing everything possible" in IRM with sounding examples. The case-study was handed out to all 131 participants prior to the questionnaire. It is based on a fictive merger situation of a private owned company having no formalized IRM in place and on the other hand having a fictive multi million global enterprise having all IRM methods implemented. The participants were fictively asked to help the M&A team consisting of people of both companies to discuss the meaning and the sense of IRM for the future Joint venture company and esp. the relation to the positive contribution in the Improvement of Strategic Decision Making factors.

To ensure exact mapping of the exogenous- and the endogenous variables and also to ensure same "expressions" and the underlying precise definitions of the IRM Variables, already concatenations (all exogenous to all endogenous) variables were formed. The participants were asked to give their appraisal to what extend an explicit relation would be valid (between exogenous and endogenous variables) via a Likert-"5"-Scale (Strongly Agree, Agree, Neither, Disagree, Strongly Disagree). The participants were instructed to treat the non-parametric Likert Scale as equidistant with 20% range of each criteria, with the clear goal to generate a quasi-parametric result.

Statistical Method

The statistical evaluation, whether a significant (> 95% confidence) similarity or significant difference between the opinion of the experts and the mid-Managers was performed with two independent statistical test procedures – one non-parametric test, the Mann-Whitney-U-Test which compares the rank means of the results and on the other hand with the parametric test, the T-Test where the results out of evaluation 1 (*Structured Expert-Interviews*) were taken as Empirical Norm to test against results out of evaluation 2 (*Case Study with Questionnaire 131 midlevel managers*).

This setup was chosen to develop statistically reliable results – both, non-parametric test method and parametric test method are applicable for the current test-setting – but with doing both in parallel, any valid critics on the individual usage of the one or other method's weakness might be eliminated when comparing the two results from a semantic point of view – finally it can already be noted, that both methods lead to similar tendencies in the results without any conflict or contradiction. In the following the test results of both methods are examined and shown, starting with the results of the Mann-Whitney-U test first and followed by the results of the T-Test.

The Mann-Whitney-U-Test is based on the idea of ranking the result data, which means, not the results themselves are used for any further calculation, only their ranks will be used for further testing. The calculation is therefore based only on the order of the ranks (greater than, smaller than). The distances between the results are not considered – this, because ordinal-scale does not allow to compare the distances, it could be assumed equidistance between the values without any further condition. The mathematical calculation and the formula are further shown in the annex only

The 2-tailed T-Test is testing differences against the given Empiric-Norm (from *Expert Interviews*). The ***Error! Reference source not found.*** shows the T-Test resulting cross-table including the average results ("<...>AVG") for all criteria aggregated. Values shown are inverted (Result=1-Value):

Table 2

Cross-table Mann-Whitney-U test results

		IRM Information Protection		IRM Information Controls	
		Mann-Whitney U	Asymp. Significance (2-tailed)	Mann-Whitney U	Asymp. Significance (2-tailed)
Anticipated damage control / prevention	Level of readiness in information access control	8122	,417ch	2096	,000ch
	Level of actively decreasing Risks	7467	,049ch	2358	,000ch
	Level of readiness to reduce rewards for theft / disclosure	7336	,029ch	4716	,000ch
	Level of readiness to reduce provocations (frustration/stress etc.)	2620	,000	7467	,051ch
	Level of readiness to remove excuses (clear rules, alerting conscience)	7467	,050ch	2489	,000ch
	Anticipated damage prevention and control aggregated	6026	,000	7729	,137ch

Source: author's calculations based on 131 Business Experts (Midlevel-Managers) Questionnaires and IRM-Experts Interviews

Table 3

Cross-table of *2-tailed T-Test results*

		IRM Information Protection (empiric norm: 0,8166)			IRM Information Controls (empiric norm:0,7423)		
		Significance T-Test (2-Tailed)	Mean	Standard Deviation	Significance T-Test (2-Tailed)	Mean	Standard Deviation
Anticipated damage control / prevention	Level of readiness in information access control	,023*ch*	,8531	,1804	,000*ch*	0,8130	0,1945
	Level of actively decreasing Risks	,529*ch*	,8263	,1751	,001*ch*	0,7996	0,1947
	Level of readiness to reduce rewards for theft / disclosure	,158*ch*	,7901	,2144	,840*ch*	0,7462	0,2192
	Level of readiness to reduce provocations (frustration/stress etc.)	0,000	,5611	,2826	0,000	0,6126	0,2896
	Level of readiness to remove excuses (clear rules, alerting conscience)	,101*ch*	,7805	,2500	,012*ch*	0,7939	0,2310
	Anticipated damage prevention and control aggregated	0,000	,7622	,1426	,428*ch*	0,7531	0,1546

Source: author's calculations based on 131 Business Experts (Midlevel-Managers) Questionnaires and IRM-Experts Interviews

For both test-methods, the results have to be read in the following notion:

Result ≥ 0, 99 $\overset{def}{\equiv}$ "Highly Significant Difference" between the view of the 10 *IRM-Experts* and the view of the 131 *Midlevel Managers* tested

Result ≥ 0, 95 $\overset{def}{\equiv}$ "Significant Difference" between the view of the10 *IRM-Experts* and the view of the 131 *Midlevel Managers* tested

Result < 0, 95 $\overset{def}{\equiv}$ "No Significant Difference" ≙ "significant conformity" between the view of the 10 *IRM-Experts* and the view of the 131 *Midlevel Managers* tested

Result in the Relation between IRM-Information-Controls to Strategic Decision Making Improvement of Efficiency and Effectiveness

The T-Test results show, that in this case five out of six criteria chosen are not meeting the empiric norm of 0,7423 and in consequence also the aggregated variable of SDM-Efficiency and Effectiveness is statistically not confirmed by the Mid-Level-Managers. Also the aggregated T-Test result is highly significant different from the empiric norm. Looking into the statistical details of the parametric T-Test results it could be observed that the mean values of the significantly different measurement criteria are between a level of 0,527 up to 0,672 which even indicates an average answer of "neither" agree or disagree – which is far from the view of the IRM-Experts empiric norm. The Standard-Deviations are also comparably high with values between 0,250 up to 0,301 which shows also in the distribution some inhomogeneity. Again interesting, the lowest standard-distribution value is in the one criteria which was confirmed being not significantly different – the "level of individual Efficiency in information handling" here the Standard-Distribution is comparably low at 0,256. With this result the T-Test indicates an almost clear non-conformity of the Mid-Level-Managers perception in relation to the IRM-Experts view.

The Mann-Whitney-U-Test interestingly results into one out of six criteria where the test itself shows conformity, for the others it does result in significant differences. While also considering the mean ranks, it figures out, that two further criteria do even have higher mean ranks than the empiric norm, which would also result into a confirmation of the hypothesis. The two cases are the measures of (1) the "Level of willingness to treat information also as valuable good or as good sold!" and (2) the "Level of individual Efficiency in information handling. The mean rank comparison shows that Mid-Level-Managers mean rank is at 155 to 108 of the empiric norm for both criteria. Looking further into the single values of the criteria of the "level of willingness to treat information also as valuable good or good sold" it can be figured out that 4 Mid-Level-Managers ranked with very extreme choices on the "fully disagree" and also 15 on "disagree", 23 on "neither" 65 on "agree" and 24 on "fully agree". Almost similar for the other special case of the criteria of "Level of individual and personal efficiency in Information handling", with the following ranking of the Mid-Level-Managers, 3 on "fully disagree", 13 on "disagree" 26 on "neither", 53 on agree, and 36 on "fully agree". Here the distribution to the top-end is even more flat than in the other criteria. All in all this represents a comparably strong distribution in the answers of the Mid-Level-Managers. The test against the aggregated values of all six measures is resulting in a clear different perception of the Mid-Level-Managers compared to the empiric norm.

Test Result: The two Methods of Mann-Whitney-U-Test and T-Test show for four out of the six criteria similar tendency in the results, where three of the four are showing similar significant difference, and the fourth showing same tendency of conformity in both test methods. Even more interesting to investigate are the two cases of different result tendencies of the two test-methods. As mentioned in this two special cases the distribution of the single values is quite spread down to also a few "fully disagree" (around 4) and "disagree" (around 13) – in the calculation of the means in the

T-Test and further on it would heavily bring the means down. On the other hand the total of only 4+13 = 17 ranks that are at the far-end in the Mann-Whitney-U test do not impact the high number of 114 values around "neither", "agree", and "strongly agree". In other words, it seems quite obvious, while comparing ranks, this would differently impact the result than the mean calculations in the T-Test. As a result out of this for further interpretation, it might be to debate, if three out of six conforming results (out of the Mann-Whitney-U-Test) or only one out of six conforming result out of the T-Test makes a difference, as the overall tendency of both tests shows in total not a really conform perception of the Mid-Level-Managers compared to the level of the empiric norm over all. In both ways, the tendency is quite clear indicating further actions of improvement / corrective actions, discussed in the next sub-section

Interpretation of Test Results: The test results show in both Test Methods a clear and consistent tendency of significant differences between the Mid-Level-Managers perception on the causal relation between IRM-Information Controls and SDM Efficiency/Effectiveness. In other words, the Mid-Level-Mangers would see the causal relation with the tendency of lower importance that IRM-Effectiveness/Efficiency would contribute to SDM Information Controls as a causal relation. Mid-Level-Managers perception that SDM Effectiveness/Efficiency would be a result of a causal relation beginning also with IRM Information Controls measures is non-confirming the hypotheses. It has to be noted, with the two "over-confirming" results of the Mann-Whitney-U-test it could be discussed controversy, because it shows that the perception of the Mid-Level-Managers is statistically over-confirming the empiric norm for "the level of individual personal efficiency" and the "willingness to see information as valuable good / good sold". While the T-Test confirms the opposite, this cases have to be on the spot for further treatment in business organizations in the next subchapter.

Impact for Business Organizations: as both test show overall similar tendency of non-conformity of the perception compared to the empiric norm, but also in two criteria controversy it is even most important for business organizations to put this onto the spot. An applicable and balanced level of perception needs to be reached – here even more, this calls for detailed and reoccurring review of the business organizations to either improve on the on hand side, but also to balance down the perception where it is seen as too high. As potential concrete corrective actions a solid training/awareness campaign is proposed, accompanied by a setup of an independent experts-organization, which can help the departments to leverage activities and efforts on a balanced level. Especially this case shows clearly, that there might be a highly inconsistent view onto the relation of "IRM information controls" triggers "SDM Efficiency/effectiveness" in current business organizations which means, that even in same Enterprises different departments do different effort to achieve. This consequently might end up in a risk of highly inconsistent information treatment on which aggregated /strategic decisions are built on. Business organizations need to be aware also of the potentially different internal organizational treatments. This only could be improved in a very individual applicable treatment of the different parts of the organization

Result in the Relation between IRM-Information-Controls to Strategic Decision Making Improvement of Anticipated Damage Prevention and Control

The T-Test results show a significant difference of four out of five measurement criteria results in relation to the empiric norm. Here also the aggregated view of the variable itself shows a high conformity to the empiric norm. While looking also into the parametric test results it could be observed, that those four out of five mean-values of the measurement criteria are even higher than the empiric norm. Even more interesting to see, that the standard-deviations are homogenous and comparably low with values between 0,195 and 0,201. Whereas the only one criteria being far below the empiric-norm, with a mean value of 0,613 having a standard-deviation of 0,290 seems comparably in-homogenously.

The Mann-Whitney-U-Test firsthand shows in four out of five criteria measured significant difference to the empiric norm, one case showing significant conformity. Looking into the mean ranks, of the measurements, it could be observed,

that for the four non-conforming criteria, all according mean ranks are higher than the mean rank of the empiric norm, which leads to the result, that the hypothesis could be confirmed. It has to be noted, while the Mann-Whitney-U-test shows significant difference, that for this four cases the perception of the Mid-Level Managers is significantly on a higher level than the empiric norm. Instead, the aggregated test result for all five measurement criteria is showing significant conformity according the Mann-Whitney-U test.

Test Result: The two Methods of Mann-Whitney-U-Test and T-Test show for all five cases similar tendency of conforming / over-conforming to the hypothesis. In particular, three out of the five criteria show even similar tendency in the results, where both test show firsthand non-conformity, but while looking into the means and mean-ranks, it an "over-conforming" could be shown. With one criteria, the "level of readiness to reduce awards for thefts/disclosure" the T-Test shows conformity to the empiric norm, whereas the Mann-Whitney-U-test shows "over-conformity". This might be result of the detailed results for this relation which are also showing a few number of extremes, in particular it shows for "Strongly disagree" one case, for "Disagree" even 5 matches, for "neither already 30 cases, for "agree" 54 cases, and for "strongly agree" 41 cases. In summary this is a comparably flat distribution over the three values of "neither", "agree", and strongly agree, with even a few outliers which might not influence the mean ranks in the Mann-Whitney-U-test as the calculation of the means in the T-Test. In the other special case/measurement of the "level of readiness to reduce provocations", the T-Test shows a significant difference with not conforming the hypothesis where the Mann-Whitney-U Test shows conformity of the test-results within the range. Also looking here into the particular answers of the Mid-Level-Managers, which are: 8 votes for "strongly disagree", 23 for "disagree", 26 for "neither", 50 for "agree", and 24 for "fully agree". With this a similar trigger as the above discussed reason might lead to the different test-results between the two test methods. The comparable wide and flat distribution might leads in the rank-comparison to a confirming result whereas the calculated means of the T-Test would "drift" down comparably far and not confirm conformity.

Interpretation of Test Results: The test results show in both Test Methods a clear and consistent tendency of significant conformity to the hypothesis between the Mid-Level-Managers perception on the causal relation between IRM-Information Controls and SDM Damage Control/Prevention. In other words, the Mid-Level-Mangers would see the causal relation with the tendency of importance that IRM- Damage Control/Prevention would contribute to SDM Information Controls as a causal relation even on a higher level than the empiric norm of the IRM-Experts. Mid-Level-Managers perception that SDM Damage Control/Prevention would be a result of a causal relation beginning also with IRM Information Controls measures is confirming the hypotheses.

Impact for Business Organizations: as both test show overall similar tendency of over-conformity of the perception compared to the empiric norm an applicable and balanced level of perception needs to be reached – here even more, this calls for detailed and reoccurring review of the business organizations to carefully limit the engagement in a well-balanced and individual way. As potential concrete corrective actions a solid training/awareness campaign is proposed, accompanied by a setup of an independent experts-organization, which can help the departments to leverage activities and efforts on a balanced level. Especially this case shows clearly, that there is a general perception of Mid-Level-Managers on Information Risk-Management but seemingly limited to only this special case, which is in tendency over-stressed.

This consequently might end up in a risk of highly inconsistent information risk managementd treatment which is focused too much on technical controls, which seem to be the way of doing IRM at all. Also here aggregated /strategic decisions are built on this behavior – consequently, there is a risk in current business organizations that out of this, the focus even on executive level is too limited in this aspect and potentially too much attention (and money) is given to it compared to the other triggers in IRM modelled in this scientific work.

Statistical Results vs. Hypothesis

As shown in both tables the result of the structured IRM-Expert-Intervies proves significantly the validity of the choosen endogenous variable *Information Controls* and the positive correlation to be seen as essential contributing factors for future successful *Improvement of Strategic Decission Making.*

With this, H_0: "There is no difference in perception between IRM Professionals and Midlevel -Managers of the correlation between *IRM Information Protection and Information Control* and *Improvement of Strategic Decision Making in Damage Prevention and Control.*" **could be accepted as stated.**

Paradoxon in the Overall Result

Quite interesting, as a result of statistics it could be shown that in both relations examined, the **tendency of "over-doing" is clearly visible.** In other words, current perception on the correlations shows in both cases the tendency **to first fail similarity statistically** in the group-comparison but due to the single sided hypotheses, it could be shown, that the **general conformity is given, but even with significant difference** on the conformity side.

Conclusion, Proposal, Recommondation, Limitation

In current and future times, where *Information* is a more and more important successfactor for any business person, also individually, to make good and sustainable business decision, it is important to ensure solid IRM enterprise-wide. Therefore, as a result ot of this study, it is recommanded to mandatorily anchor IRM Methodology as a formal funktion in top-Management like a "Quality-Assurance" – being independet and mandated to drive, follow up and change where necessary, to support ALL business functions proactively and with state of the art methodology and toolsets to unburden Midlevel-Management from this principal activities and individual approaches but clearly not taking the accountability for the departmental owend/required information assets to ensure the right balance between efforts and outcome, but also to not only focus on the examined areas in the context of Informaiton Risk Management.

Future Scientists might procede on how to exactly setup and drive this methods in an economic meaningful way, setup procedures and models and define the kind of organizational relations (e.g. reporting-lines) necessary which was not part of this scientific work.

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FACEBOOK AS A COMMUNICATION CHANNEL FOR CROWDFUNDING CAMPAIGNS

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Abstract. Today more companies than ever are using crowdfunding websites to fund their projects. In Latvia, this is evidenced by the growing number of companies that are participating in crowdfunding campaigns and by the government activities that are supporting this.

One of the success factors of crowdfunding campaigns is the use of social media networks. The most used social media network by companies in Latvia is Facebook. Hence, it is essential to determine the differences in communication on Facebook among successful and unsuccessful crowdfunding campaigns.

The aim of this paper is to conduct Facebook account analysis of all the Kickstarter crowdfunding campaigns that were published in 2015 in technology category, to determine what kind of Facebook metrics should campaigns attain to raise the possibility that their crowdfunding campaigns will be successful.

To achieve the aim of the paper several research methods were applied: 1. Theoretical literature analysis to determine with Facebook metrics should be analysed; 2. Secondary data research method was applied to: a. Collect Kickstarter technology category campaign data; b. Collect data from Kickstarter campaign Facebook accounts. Statistical package for the social sciences (SPSS) was used to analyse collected data. SPSS was applied for following analysis methods: 1. Correlation analysis; 2. Analysis of variance.

The results of the paper were: 1. The main metrics that can indicate if crowdfunding campaign will reach its goal and be successful or not were determined; 2. Recommendations that can increase the crowdfunding campaign being successful were proposed.

In practice, this paper can be used as an informational material while developing marketing strategy for crowdfunding campaigns. The theoretical contribution of this paper is that it can be used as a basis for other crowdfunding researches that examine the social media influences on technology crowdfunding campaigns.

Key words: *analysis, crowdfunding, Facebook, Kickstarter*

JEL code: M31, G20

Introduction

Crowdfunding industry is growing, this is evidenced by millions of USD that are invested in this market yearly. In the year 2012., the total funding received by crowdfunding campaigns was 2.7 billion USA dollars, in 2015 the number grow till 34.4 million USA dollars. And the crowdfunding market has been growing since (Statista, 2017).

Also in Latvia crowdfunding is becoming more popular. More companies then ever have been starting to use crowdfunding as their source of funding. Latvian start-up AirDog is one of the success stories. Start-up AirDog raised more than 1.3 million USD through Kickstarter crowdfunding website in year 2014 (AirDog, 2014). Since then other companies and start-ups have been using crowdfunding as their campaign funding source, as for example: Displio, Rubicon 3D scanner (Displio, 2017., Rubicon., 2017).

The most popular reward based crowdfunding website in the world is Kickstarter. In the year 2014., 22252 campaigns were successfully funded just alone through this website, in year 2017., already 125483 campaigns were funded and totally 3,06 billion USD where pledged (Kickstarter, 2017).

According to authors previously conducted research, Kickstarter technology category campaigns have the least number of successful campaigns (Skulme R., 2017). Only 20% of all projects that are submitted receive the necessary funding.

Finding out the factors that can help crowdfunding technology campaigns be successful could help companies attract more funding for their projects.

Because Kickstarter is the biggest reward based online website worldwide and reward based crowdfunding websites are quite similar fundamentally, author will analyse Kickstarter campaigns. Technology category was chosen because of the low successful project funding rate and the large amount of submitted campaigns.

Prior studies have been conducted to determine crowdfunding success factors. According to studies some of these factors are crowdfunding campaign duration and campaign goal (Mollick E., 2014; Kuppuswamy V., Bayus B., 2014). Some researchers suggest that the amount outstanding to the campaign goal and the contribution frequency has also effect on crowdfunding campaign success (Burtch et al., 2013).

According to researchers' social media is also one of the crowdfunding campaign success factors (Agrawal et al., 2011; Davis and Webb, 2012; Marom and Sade, 2013; Younkin and Kaskooli, 2013). Some of the factors that can influence the outcome of the crowdfunding campaign are: 1. the campaigns creator's social network size (Kuppuswamy V., Bayus B., 2014); 2. the number of posts posted on social networks (Chun-Ta Lu et al.,2014); 3. linguistic style (Parhankangas. A. et al., 2017). There are other researches that have identified factors that can influence crowdfunding campaigns but there still very few researches that examine social media effects on crowdfunding campaigns.

One of the most used social media sites by companies is Facebook (Kallas. P., 2017). That is why author chose to analyse Facebook's impact on crowdfunding campaign success.

The aim of this paper was to determine what kind of Facebook metric results crowdfunding campaign managers should achieve to increase the chance that their crowdfunding campaign will be funded. To achieve the aim of the paper author decided to propose following research questions: 1. What are the Facebook metrics which could influence crowdfunding campaign success? 2. What kind of social media metric results should campaigns achieve to be successful? To achieve the aim of the paper author decided to use the following approach, first of all author will conduct a theoretical literature analysis to determine which are the most important social media metrics, then author will collect information from Kickstarter website using Python programming language (Python., 2017). After the collection of information all the data will be analysed with statistical package for the social sciences (IBM., 2017).

To achieve the aim of the paper and answers the research questions several research methods were used: 1. theoretical literature analysis to determine which are the Facebook metrics that should be analysed; 2. Secondary data analysis was used: a. To collect Kickstarter technology campaign data, such as the amount pledged by the campaigns; number of backers; number of social sites used; b. To collect data from Kickstarter campaign Facebook profiles. Following data was collected from Facebook accounts such as: number of profile likes and talking about; number of posts per day; post lengths; number of post likes; number of post shares; post types. After the collection of data, statistical package for the social sciences (SPSS) was used to analyse the collected information. SPSS was used primary for descriptively analyse of the collected data, to conduct correlation analysis and to conduct variance analysis.

Research Results and Discussion

The study yielded following results. First of all, author conducted theoretical literature analysis and determined with Facebook metrics should author use to determine Facebook's impact on Kickstarter campaign success. According to many authors the most used Facebook metrics to determine Facebook communication efficiency and that can be collected without having access to the Facebook page analytics are: page likes; talking about; post likes; post shares; number of posts; post length; post types (Skulme et al, 2015). And following Kickstarter metrics were used to determine to efficiency of Facebook on Kickstarter campaigns: raised amount; number of investors (Nelson R., 2012).

After the theoretical analysis author extracted information using Python programming language from Kickstarter website. Author extracted technology category campaign data from 1. January 2015 till 31. December 2015. In this period, 6621 Kickstarter campaigns were posted in technology category, see table 1. 1351 campaigns were successful, by successful campaign author means: campaigns that pledged the targeted amount during the campaign period. 5270 campaigns were unsuccessful, by unsuccessful campaigns author means: those campaigns that were not able to collect the target amount during the campaign.

As shown in table 1., the average target amount of successful campaigns was 27216 USD, the average target amount of unsuccessful campaigns was 121745 USD. We can see that in average, unsuccessful campaigns set their target amount more than 4 times higher than successful campaigns. In average, successful campaigns pledged 88556 USD, but unsuccessful campaigns 1948 USD. In average, a successful campaign was backed by 671 backers, unsuccessful campaigns by 15 backers. Average duration of a successful campaign was 34 days, for an unsuccessful campaign 35 days. The total duration of all successful campaigns was 45885 days, the total duration of all unsuccessful campaigns was 186290 days.

Table 1

Kickstarter campaign descriptive statistics

	Successful campaigns				Unsuccessful campaigns			
	Target amount (USD)	**Pledged (USD)**	**Backers (number)**	**Duration (days)**	**Target amount (USD)**	**Pledged (USD)**	**Backers (number)**	**Duration (days)**
Valid	1351	1351	1351	1351	5270	5270	5270	5270
Missing	0	0	0	0	0	0	0	0
Mean	27216	88556	671	34	121745	1948	15	35
Minimum	1	20	1	3	1	0	0	1
Maximum	500000	2950875	39560	89	60000000	262654	2620	60
Sum	36768486	119639120	906633	45885	641597756	10264821	80010	186290

Source: author's calculations based on extracted data from Kickstarter

In the next stage frequency of social media links in the Kickstarter campaigns were analysed. Most often used social media sites in Kickstarter technology category both by successful and unsuccessful campaigns are Facebook and Twitter. Then the results vary, successful campaigns most often use social media sites in the following order: Instagram, YouTube, LinkedIn, Pinterest, Google Plus and Wikipedia. Unsuccessful campaigns most often use: LinkedIn, Instagram, YouTube, Google Plus, Pinterest and Wikipedia. The average pledged amount by a successful Kickstarter campaign that used Facebook was 101884 USD.

In the following stage, social media link combinations of successful campaigns were analysed, see table 2. The results showed that almost all of the top 10 social media sites combinations that pledged the most funds were using Facebook. The two campaigns that pledged most of the funds used Twitter, Facebook, YouTube and LinkedIn in their campaigns,

in average they pledged 661565.2 USD. The third and fourth most often used social media sites are: YouTube and Instagram, four of the top 10 social media combinations have used these social networks. The less often used social media sites in the top 10 social media combinations are Pinterest and Google Plus, these social media site have been used only once.

Table 2

Successful Kickstarter campaign social media channel usage combinations

Average pledged amount per campaign (USD)	Number of cases	Twitter	Facebook	YouTube	Instagram	Pinterest	Wiki	LinkedIn	Google Plus
661565.2	2	X	X	X				X	
391045.8	5	X	X		X	X			
217090	6	X						X	
176528.9	15	X	X	X					
160539	1	X	X		X		X		
158555.1	43	X	X		X				
134902	1						X		
110485	1		X	X					X
109977	1			X	X				
108010.2	117	X	X						

Source: author's calculations based on extracted data from Kickstarter

In the following stage, the number of social media sites was analysed to determine, if the number of social media sites in campaigns influences the average amount that a campaign will pledge, see table 3. As shown table 3., the successful campaigns that used 2 or more social media sites pledged 24386.95 USD more, then successful campaigns that did not use any social media sites at all. After analysing unsuccessful campaigns, the same conclusion was made, that campaigns that used 2 or more social media sites pledged 2624.98 USD more, than campaigns that did not use any social media sites.

Table 3

Successful Kickstarter campaign social media channel usage

Number of social media sites	Average collected amount per campaign (USD)	The amount exceeding the target amount (USD)	Average number of investors per campaign
2 and more	112202.9	76169.95	834
1	64062.05	41824.55	608
0	87815.95	61999.95	637

Source: author's calculations based on extracted data from Kickstarter

In the next stage, Kickstarter campaign Facebook profile likes and talking about were analyzed, see table 4. From the 353 successful campaigns, 244 Facebook links were working, and 311 from 660 unsuccessful campaign Facebook links were working. One campaign was removed from the sample because it had a really high Facebook page like count.

As the results showed, successful campaign Facebook profiles on average have 7117.12 likes, and 111.68 talking about. The minimum likes that a successful campaign had is 0, the maximum likes that a profile had was 202188. In total, successful Kickstarter campaign Facebook profiles have 1736577 likes.

Unsuccessful Kickstarter campaign Facebook profiles in average have 3735.96 likes and 56.09 talking about. The minimum number of likes that a campaign Facebook profile had is 0, the maximum 242195. From the results we can see,

that successful campaign Facebook profiles have in average almost two times as much likes as unsuccessful campaigns, and almost two times the talking about, see table 4.

Table 4

Successful and unsuccessful Kickstarter campaign Facebook profile statistics

		Successful campaigns		Unsuccessful campaigns	
		Likes	**Talking about**	**Likes**	**Talking about**
N	**Valid**	244	244	311	311
	Missing	0	0	0	0
Mean		7117.12	111.68	3735.96	56.09
Range		202188	3770	242195	17272
Minimum		0	0	0	0
Maximum		202188	3770	242195	17272
Sum		1736577	27251	1161885	24903

Source: author's calculations based on the extracted data from Facebook

In the next stage, Kickstarter campaign Facebook post frequency was analyzed. As the results show, successful campaigns on average post 45.63 posts during a campaign, unsuccessful campaign 19.3. A conclusion can be made from these results, that successful campaigns post on average more than 2 times as much as unsuccessful campaigns. As show in table 5., the smallest number of posts that a successful Kickstarter campaign posted on Facebook was 1, the largest number of Facebook posts posted was 2247. The smallest number of posts posted by an unsuccessful campaign was 1, the largest amount 104. In total successful campaigns posted 10816 posts during campaigns, unsuccessful campaigns 5987 posts, see table 5.

Table 5

Successful and unsuccessful Kickstarter campaign Facebook post frequency statistics during campaign

		Successful campaigns	Unsuccessful campaigns
		Number of posts	**Number of posts**
N	**Valid**	237	309
	Missing	0	0
Mean		45.6371	19.3754
Range		2246	103
Minimum		1	1
Maximum		2247	104
Sum		10816	5987

Source: author's calculations based on the extracted data from Facebook

In the next stage, in-depth analysis of Kickstarter campaign Facebook profile post frequency was conducted, to see if the number of posts per day influences the pledged amount of the Kickstarter campaigns, see table 6. As the research results show, the Kickstarter campaigns that posted on Facebook 1 to 3 times per day achieved the best results. This is observed both in successful and unsuccessful campaigns. Successful campaigns that posted once per day in average received 127432.31 USD. Successful campaigns that posted two times per day in average received 158815.26 USD. Successful campaigns that posted 3 times per day on average received 116727.41 USD, see table 6.

Table 6

Successful and unsuccessful Kickstarter campaign Facebook post frequency statistics

	Successful campaigns		Unsuccessful campaigns	
Posts per day	**Number of cases**	**Average income per campaign (USD)**	**Number of cases**	**Average income per campaign (USD)**
0	87	58615.44	203	4486.54
1	104	127432.31	71	11521.59
2	25	158815.26	27	3932.88
3	12	116727.41	8	34700
4	3	104031.33	0	0
5	2	65540.72	0	0
6	1	58079	0	0
7	1	184305	0	0
10	1	28591	0	0
56	1	60123	0	0
Sum	237	103366.62	309	6836.86

Source: author's calculations based on the extracted data from Facebook

During the next stage, posts lengths of Kickstarter campaign Facebook posts were analyzed, see table 7. The results showed, that during a Kickstarter campaign the average total length of successful campaigns Facebook posts is 7926.87 characters, whereas unsuccessful Kickstarter campaign Facebook posts length is 3617.46. The average length of successful and unsuccessful campaigns post is almost the same, successful campaign average Facebook post length is 181.76 characters, unsuccessful campaign's Facebook posts average length is 186.51 characters. During a Kickstarter campaign the minimal number of characters that a successful campaign has posted on Facebook is 0, the maximum is 363921, whereas unsuccessful campaigns minimal total length of posts is 0, but maximal length is 46001 characters. The minimal length of a single post of a successful campaign is 0 characters, but maximal length is 1103 characters, the minimal post length of an unsuccessful campaigns Facebooks' post is 0 characters, but maximal is 1486 characters long, see table 7. The total length of all Facebook posts of the successful Kickstarter campaigns is 1878669 characters,

Table 7

Successful and unsuccessful Kickstarter campaign Facebook post length statistics

		Successful campaigns		Unsuccessful campaigns	
		Total length of posts (characters)	**The average length of a post (characters)**	**Total length of posts (characters)**	**The average length of a post (characters)**
N	**Valid**	237	237	309	309
	Missing	0	0	0	0
Mean		7926.87	181.76	3617.46	186.51
Range		363921	1103	46001	1486
Minimum		0	0	0	0
Maximum		363921	1103	46001	1486
Sum		1878669	43079	1117797	57634

Source: author's calculations based on the extracted data from Facebook

In the next stage, in-depth analysis of Kickstarter campaign Facebook post lengths was conducted to determine if the posts lengths influence the amount that a campaign will pledge, see table 8. The results show, that the successful campaigns whose post length were between 50 and 299 characters pledged the most funds.

Table 8

Kickstarter campaign Facebook post length and income statistics

	Successful campaigns		Unsuccessful campaigns	
Average lenght of the posts (characters)	**Number of cases**	**Average income per campaign (USD)**	**Number of cases**	**Average income per campaign (USD)**
0 - 49	6	43290.22	14	1073.64
50 - 99	29	75815.3	54	10483.41
100 - 149	72	106059.22	98	5736.46
150 - 199	48	113431.95	51	8936.24
200 - 249	45	126518.2	31	5089.51
250 - 299	18	114676.69	14	9552.28
300 - 349	6	32306.42	11	4784.73
350 - 399	3	6834.27	13	7088.76

Source: author's calculations based on the extracted data from Facebook

In-depth analysis of Kickstarter campaign Facebook post length showed that the successful campaign posts that were above 200 characters in length received more likes than posts that were below 200 characters. In average, the posts in length between 0 and 199 characters received 4.35 likes, the posts above 200 characters received 6.9 likes.

In the next stage, Kickstarter campaigns Facebook post types were analyzed, see table 9. As the analysis showed, both successful and unsuccessful campaigns most often post site posts, then pictures and videos. One of the thing that author observed was that both successful and unsuccessful campaigns do not often use offer posts despite that offer posts provide Kickstarter campaign managers with extra marketing benefits, like Facebook notifications about the offer.

Table 9

Kickstarter campaign Facebook post type usage statistics

	Successful campaigns		Unsuccessful campaigns	
Post type	**Number of cases**	**%**	**Number of cases**	**%**
Event	92	0.8	31	0.5
Site	4888	43.9	2436	40.7
Music	1	0	3	0.1
Offer	8	0.1	2	0
Picture	4566	41	2178	36.4
Status	519	4.7	524	8.8
Video	1062	9.5	813	13.6
Sum	11136	100	5987	100

Source: author's calculations based on the extracted data from Facebook

In-depth analysis showed that most likes received picture posts, that was the case in both successful and unsuccessful campaigns, in average successful campaigns received 11.75 likes and unsuccessful campaigns 6.08 likes. The most shares received video posts, in average successful campaign video posts received 21.05 shares, unsuccessful campaigns 3.38 shares.

In the next stage, correlation analysis was used to determine what are the most important Facebook metrics that can influence the amount that will be pledged by the Kickstarter campaign. The results showed that there exists statistically significant correlation between pledged amount and post shares, profile likes, post likes and talking about, see table 10. The most important metric that can influence how much a campaign will pledge is post shares. It means, the more campaign posts will be shared by Facebook users the more likely the Kickstarter campaign will pledge more funds.

Table 10

Kickstarter campaign Facebook metrics correlation analysis

		Post shares	Profile likes	Post likes	Profile talking about	Posts per campaign	Average post length	Posts per day
Pledged amount	**Pearson Correlation**	.487**	.169**	.139**	.133**	0.07	-0.01	0.06
	Sig. (2-tailed)	.00	.00	.00	.00	0.10	0.88	0.17
	N	555	555	555	555	555	555	555
**. Correlation is significant at the 0.01 level (2-tailed).								

Source: author's calculations based on the extracted data from Facebook

Conclusions, Proposals, Recommendations

Author came to the following main conclusions:

1. Successful Kickstarter campaigns in average set their campaign target amount more than 4 times lower than unsuccessful campaigns;

2. Most often successful Kickstarter campaigns as their main two social media networks use Facebook and Twitter;

3. Successful and unsuccessful campaigns that used two and more social networks pledged more funds than those campaigns that did not use social networks in their campaigns;

4. Successful campaigns in average received about twice as much Facebook profile likes than unsuccessful campaigns;

5. Successful campaigns tend to post more than two times as much than unsuccessful campaigns;

6. Kickstarter campaigns that published Facebook posts 1 till 3 times a day pledged the most funds;

7. Successful campaigns that posted on average 50 till 299 character long posts pledged the most funds;

8. Picture Facebook posts received the most likes;

9. Most shares received video Facebook posts;

10. The most important Facebook metrics that can influence the amount that campaigns will pledge are: post shares; profile likes; post likes; talking about.

Following proposals are put forward from the conclusions:

1. Crowdfunding campaign developers must set the lowest possible target amount to increase the possibility that the campaign will be funded;

2. Facebook and Twitter must be used as the main social media networks for communication with possible crowdfunding campaign backers;

3. Crowdfunding campaign managers should use at least two social media networks to communicate with possible crowdfunding campaign backers;

4. Crowdfunding campaign managers should post on Facebook 1 till 3 times per day;

5. Crowdfunding campaign managers should keep their Facebook post lengths between 50 and 299 characters;

6. The most important Facebook metrics that crowdfunding campaign managers should keep track off are: post shares; profile likes; post likes; talking about.

In practice, this paper can be used as an informational material for crowdfunding campaign managers to compare their campaign results with the successful crowdfunding campaign metrics. This paper can be used as a guide and informational material for crowdfunding campaign managers while creating their crowdfunding campaign marketing strategy.

The theoretical contribution of this paper is that this paper can be used as foundation for further crowdfunding campaign influential factors.

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SOCIAL NETWORKS FOR HIGHER EDUCATION EXPORT

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Abstract. Demographic changes in many countries, recent political problems in several countries and demographic situations in many countries encourage many universities offer study programs for foreign students – participate in higher education export. Higher education export different aspects are on research agenda for numerous researchers in many countries world-wide to develop the most efficient approaches and use recent technological tools including social media for foreign student attraction.

Data that were presented in the report by Ministry of Science and Education show that in the previous academic year (2015/2016) the proportion of foreign students in institutions of higher education has reached 8%. The forecast for year 2016/2017 is even higher - 10%. This number has risen significantly over the past several years. Higher education export in Latvia is fast growing sector. It contributes to the national economy directly (by tuition fees and taxes - EUR 84.5 million) and indirectly (housing expenses, buying food, tourism etc.).

Aim of the paper is social network applications analysis for higher education export; how efficient information interesting for students on higher education study programs is reflected in official messages in social networks of the countries, ministries and higher education institutions.

Research methods used: scientific publications studies; analysis of previous performed research on social network applications for higher education export; empirical analysis of countries (Baltic countries and several Nordic countries), ministries and higher education institution social network information on higher education study programs available for foreign students, foreign student survey on social network information on study programs. The evaluations of different aspect availability and information quality is evaluated in scale 1 – 10, where 1 – not available and 10 – available in full extent. For empirical data analysis there are used main descriptive statistics indicators – indicators of central tendency or location and indicators of variability.

The research results showed that there are analysed several different aspects covered in professional and private networks, social networks for possible foreign students is often the first information source on possible studies in foreign country, than followed by information on webpages, university ratings, word of mouth. Research showed that the recent findings on information requested for interest of foreign students and higher education institutions have some challenges to provide information in social networks also in English.

Key words: *higher education export, social networks, marketing, foreign markets*

JEL code: M31, L86, M38.

Introduction

Demographic changes in many countries, recent political problems in several countries and demographic situations in many countries encourage many universities offer study programs for foreign students – participate in higher education export. Higher education export different aspects are on research agenda for numerous researchers in many countries world-wide to develop the most efficient approaches and use recent technological tools including social media for foreign student attraction.

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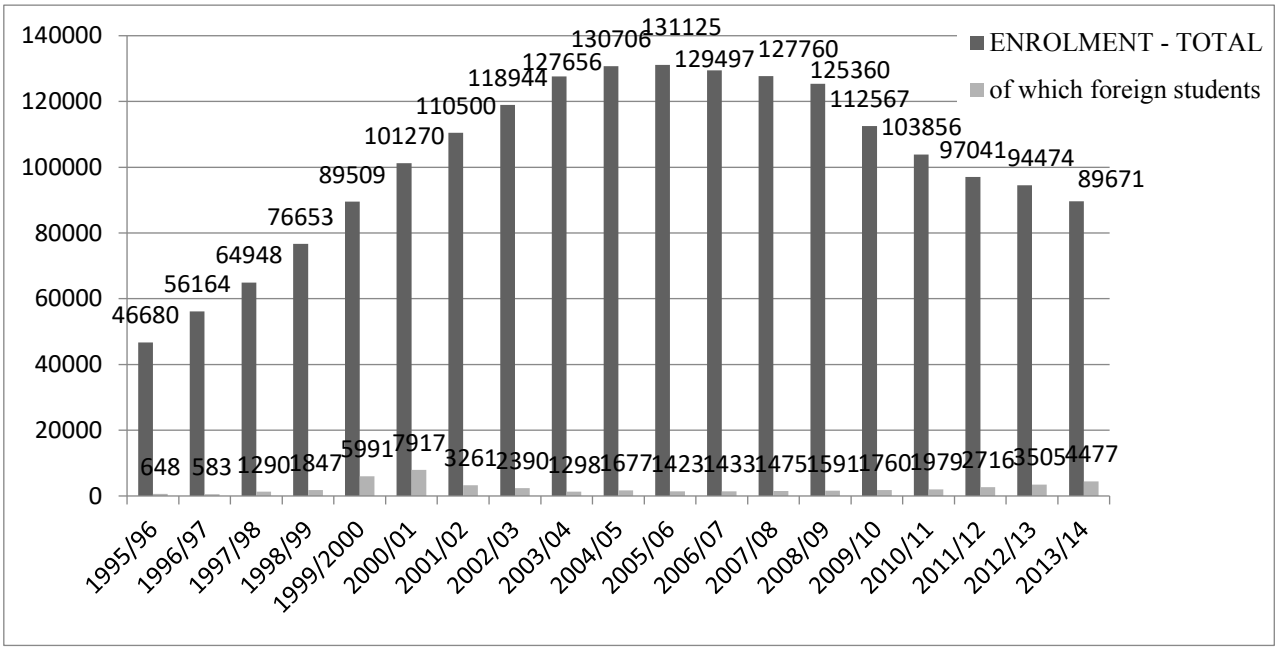
Research results and discussion – theoretical findings

Higher education export is on research agenda for researchers in many countries and analysis is performed by different aspects, including on reputation aspects of higher education establishments (Plewa, *et al,* 2016), organization of higher education in several countries (Wai Lo, 2016; Stanford, 2016), promotion strategies to different markets (Cheung, 2010) taking into account requirements for specific markets (Mazzarol, Hosie, 1996), taking into account country's development level (Saginova, Belyansky, 2008), barriers and drivers of innovation in higher education – there was performed case study-based evidence across ten European universities (Lašáková, *et al,* 2017), migration aspects (Levatino, 2015). Important are also several marketing aspects for higher education export (Samiee, Walters, 2002). Important analysis is provided for analysis of competition and education markets with extensive comparisons of higher education export possibilities and needs in different parts of world (Marginson, 2004). In Finland already in 2010 has been prepared and discussed strategy on higher education export with practical suggestions for development of this very important branch for country development (Schatz, 2016), performed analysis of aims, strategies and practice on Finland's education export (Schatz, 2015). It is stressed that research on higher education internationalisation aspects is important for higher education expert (Kehm, Teichler, 2007) as well as that there are new and innovative approaches in use of technologies in organisation of work at higher education establishments including attraction of foreign students (Dermol, *et al.,* 2014) and promote export activities (Gråsjö, 2008). Foreign student life, motivation and problems are investigated in details (Rafi, Lewis, 2013). Academic researchers are suggesting specific marketing approaches including relationship marketing for international student recruitment (Vauterin, *et al.,* 2011). Special studies are conducted for several regions in the world (Phillips, *et al.,* 2001) as well as including international organisations (Agrawal, 2002). Researchers analyse also different aspects of foreign student life in visiting county (Gomes, 2017).

Scientific publication analysis has shown that a lot is done in higher education export research but still several uncovered aspects have to be studied deeper including higher education export marketing tools and good practices as well as mistakes.

Research results and discussion – empirical findings

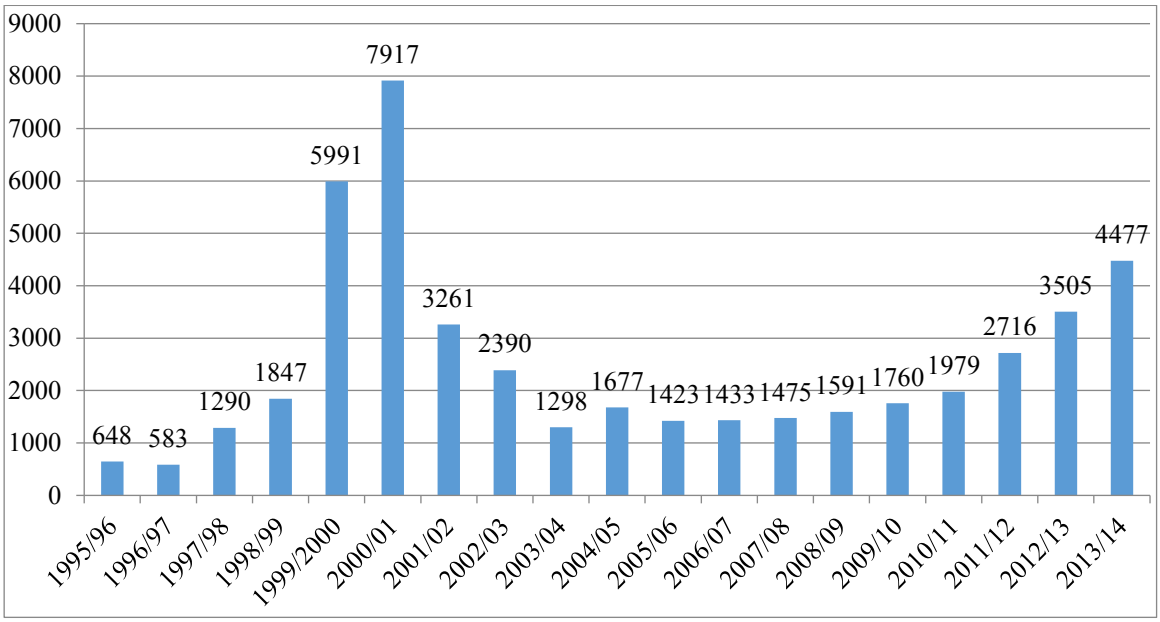
Recent statistical data of number of students in Latvia indicate that there is tendency of decrease in number of students at the same time during last decade of years there is increase of foreign students in Latvia (see figure 1).



Source: author's construction based on Central Statistical Bureau of Republic of Latvia, data on May 30, 2017.

Fig. 1. **Number of students in higher education institutions of Latvia (at the beginning of school year), 1995/96-2013/1**4

Although due different reasons including demographic and migration reasons the number of students in higher education establishments in Latvia decrease during last decade but there is good sign that during last decade there is increase of foreign students in Latvia (see figure 2).



Source: author's construction based on Central Statistical Bureau of Republic of Latvia, data on May 30, 2017.

Fig. 2. **Number of Foreign Students in Latvia's Higher Education Establishments (at the beginning of school year), 1995/96-2013/1**4

Statistical data confirm that starting from academic year 2003/2003 there is tendency that in average every year foreign student number increases by 333 students, coefficient of determination is 0,625 but during the last years increase is bigger. It means that there are a lot of challenges for attracting new foreign students and there could be used recent often used marketing technologies and modern marketing tools.

In Latvia several higher education establishments have good experience in attracting foreign students and higher education exports: In 2016 Latvia Export Award for 2015 as "Export Champion" was awarded to Riga Stradins University, good experience and results (LIAA, 2016). Also at University of Latvia number of foreign students increases every year but still the number of foreign students could be much bigger as there are several study programs offered in English and graduates are successful in their professional life and work in many countries not only in Latvia.

Importance of Latvia's higher education export:

- ✓ Branch with big export potential
- ✓ Positive influence on higher education quality

Benefits for students, for higher education establishment, teaching staff

- ✓ State image creation;
- ✓ Positive influence on education branch on country's national economy and economics.

In total foreign students contributed to for value added value for national economy of Latvia in 2015/2016 gave 22.37 million EUR (Auers, D., Gubins, S. 2016). This once more confirms that higher education export could be one of important drivers for economic development of Latvia.

Obstacles for internationalisation of higher education of Latvia

- ✓ Support and coordination from state institutions for internationalisation process;
- ✓ Absence of state marketing in higher education;
- ✓ Birocratic obstacles for visas and residence permissions;
- ✓ Short term mobility (only *2% of students in Latvia plan their future perspectives with stay in Latvia);*

- ✓ Discriminative attitude to foreign students;
- ✓ Visas for students from several countries with which Latvia has do diplomatic connections;
- ✓ Recognition of previous obtained education in third countries as often it is hard process;
- ✓ Some restrictions for language use (for state higher education establishments);
- ✓ Hard to be involved in labour market during studies
- ✓ Often other immigration goals are more important as studies;
- ✓ Watchful attitude of society towards foreign students.

«Strategic plan of University of Latvia for 2010–2020»

University of Latvia aim is to become as international recognised European and world level Research University

Table 1

Goals for involving foreign students at University of Latvia till 2020

	2013	2016	2020
Share of foreign students in bachelor level study programs	2%	-	8%
Share of foreign students in master level study programs	-	10%	15%
Share of foreign students in doctoral level study programs	3%		15%

Source: author's construction based on Strategic Plan of University of Latvia 2010-2020.

Data in table indicates that there are important plans which require hard work to reach them: to have share of foreign students in master level study programs and doctoral level study programs by 15% of all students at year 2020. To achieve this important goal it is important to know what are the most interesting and most used channels of information for foreign students. To get this information it was organised survey of foreign students. Some results of foreign student survey is reflected in table 2.

Table 2

Information sources on studies in Latvia for foreign students in 2016

Source of Information	Number	Share (%)
Social networks	40	19,2
Homepage	127	61,1
From other students	64	30,8

Source: author's construction based on survey of foreign students in 2016 (n=208)

As foreign students of University of Latvia have indicated that there are important sources of information: homepage, other students and social networks. From interviews with foreign students from China and India it was stressed that first source of information where information is checked is social networks as current generation of possible students use social networks more and more and often they trust the information on social networks more than other sources of information, biut the survey of foreign students at University of Latvia indicates that views are different and for social networks the average evaluations are the lowest comparing with other analysed sources of information (see table 3).

Table 3

Evaluations of foreign students on information sources on study possibilities in Latvia

		Internet	Homepages of HEI	Social networks
N	Valid	162	173	164
	Missing	46	35	44
Arithmetic mean		7,41	7,62	6,05
Standard Error of Arithmetic Mean		0,153	0,143	0,194
Median		8	8	6
Mode		8 un 9	8	8
Standard deviation		1,948	1,881	2,487
Variance		3,796	3,540	6,187
Range		9	8	9
Minimum		1	2	1
Maximum		10	10	10

Source: author's construction based on survey of foreign students in 2016 (n=208)
Evaluation scale 1 – 10, where 1 – lowest evaluation; 10 – highest evaluation

Taking into account responses of foreign students, it was made some analysis (by Madara Vugule) of Social networks of main higher education establishments (situation on April 17, 2017) which have more foreign students:

Riga Technical University – all information on social networks is only in Latvian, translation is not available (Facebook.com - Rīgas Tehniskā universitāte), mostly there are posts on current and next events; available also RTU cheerleading squad page, some posts are in Latvian, some in English. Several closed pages are available for ERASMUs students. Instagram – 153 posts; 305 followers; 398 follow.

Daugavpils University **(**Facebook - Daugavpils University), page description in English – short; information mainly from students or university guests; information is not available, mainly there are pictures; Instagram - daugavpils_university: 107 posts; 279 followers; 89 follow; most of the posts are in Latvian, some are in Russian and in English.

Latvia University of Agriculture (Latvijas Lauksaimniecības universitāte (LLU)): Facebook - Latvia University of Agriculture – page description short in English; information on student enrolment in Latvian. Most of information is on pictures from student events; Instagram - Latvia University of Agriculture: account is not administered by concrete administrator, pictures are posted from different accounts, information in Latvian: 902 posts; 1460 followers; 126 follow, there is special accounts for student authorities in several faculties, some faculties have their own Instagram accounts (ESAF), they are in Latvian.

University of Latvia (Latvijas Universitāte (LU)): Facebook – Latvijas Universitāte: page short description in Latvian and in English; many pictures and wide information on events (in Latvian); Facebook page – Library of University of Latvia (In Latvian and in English); each faculty have Facebook page, for example, BEVF – information mainly in Latvian, but information about Winter student enrolment is also in English. Some of faculty Facebook pages are not active – information is short or very seldom, some Facebook pages are specific, for example, University of Latvia Oncology Scientific Society (Latvijas Universitātes Onkoloģijas zinātniskais pulciņš). Instagram: 174 posts; 1,510 followers; 77 follow; Information in Latvian.

Liepaja University (Liepājas Universitāte): Facebook – Liepaja University. Short page description in English, news and information near pictures are in Latvian. Instagram – main used language – Latvian: 80 posts; 447 followers; 405 follow

Riga Stradins University (Rīgas Stradiņa universitāte (RSU)) Facebook – there are two Facebook pages: one page is for current and future students of Riga Stradins University – in Latvian; other Facebook page – Rīgas Stradiņš University is foreseen for foreign and Erasmus students, both pages are active. In pages there are information on events and studies; Instagram accounts are two: one of them is managed not by concrete administrator, pictures are included by several persons using their accounts. RSU Instagram account is place account where information is on several languages. Official RSU Instagram account rsu.lv is not very active but information which is different is in Latvian and English: 38 posts; 422 followers; 37 follow.

Banku augstskola - BA School of Business and Finance: Two Facebook pages – one is official page and another is unofficial page. More easy is to find unofficial Facebook site and then via google.com it is possible to find official Facebook site - BA School of Business and Finance. Unofficial page is place page and contains contributions of several people and companies with pictures (information in several languages); official Facebook site has information on several events and on studies, information is in Latvian and in English but content of this information is different. Two different Facebook pages can make confusion about information in both pages. BA School of Business and Finance does not have official Instagram page, it has only Instagram place accounts.

Jāzeps Vītols Latvian Academy of Music (Jāzepa Vītola Latvijas mūzikas akadēmija), academy Facebook page description is only in Latvian. In Facebook page is included papers and information only about music and musical events and almost no information about studies. Jāzeps Vītols Latvian Academy of Music does not have Instagram account, they have only place account where people publish pictures from events and also pictures from student everyday activities.

Latvian Maritime academy (Latvijas Jūras akadēmija (LJA)): Facebook – LJA – Latvian Maritime academy, Facebook page has wide description in English. Lot of student activities is reflected on this Facebook page. There is available information about different possibilities and different events, but there is missing information about study process and study programs. LJA has only Instagram place account (consists of student pictures).

Latvian Academy of Culture (Latvijas Kultūras akadēmija) - Facebook pages description in Latvian and English, but information included in the page is only in Latvian. Biggest part of the page consists of student photos as well as there are also publications and information about events but there is no information about studies neither in Latvian or English. Instagram is only the place account and not administrated profile.

Art Academy of Latvia (Latvijas Mākslas akadēmija), Facebook - Art Academy of Latvia: there are two Facebook pages – one is place Facebook page (students and visitors add photos on their visits to Art Academy of Latvia). Description of this page is in English. Other Facebook page is official page of Art Academy of Latvia – also in this page included information is about different events and photos of different realized projects. Information about studies is not available. There are two Instagram accounts: place account and administered account. Information in administered Instagram account is the same as on Facebook page. There are 186 posts; 1579 followers; 37 follow.

National Defence Academy of Latvia (Latvijas Nacionālā aizsardzības akadēmija) - Facebook page - Latvijas Nacionālā aizsardzības akadēmija: page description is in Latvian. Facebook page is not very active. There is only information about study process in National Defence Academy of Latvia. Instagram administered account is not available, there is only place account.

Latvian Academy of Sport Education (Latvijas Sporta pedagoģijas akadēmija) – there are two Facebook pages – one is place Facebook page (students and visitors include photos about their visits). Description of this page is in English. Other Facebook page is official Facebook page – Latvijas Sporta pedagoģijas akadēmija. Facebook page includes actual information and photos about Latvian Academy of Sport Education and recent events. There is included useful information for students. All included information is in Latvian, but Facebook page description is also in English. There is also place Instagram account.

The analysis of social networks at the higher education institutions indicate that there is still a lot of work to be done to include information in which are interested possible foreign students.

Conclusions, proposals, recommendations

1. The research results showed that there are analysed several different aspects covered in professional and private networks, social networks for possible foreign students is often the first information source on possible studies in foreign country, than followed by information on webpages, university ratings, word of mouth.
2. Research showed that the recent findings on information requested for interest of foreign students.
3. Research results in many countries of the world confirms that more and more important sources of information on studies possibilities are social networks;
4. Survey of foreign students results confirm that average evaluations on information in social networks are smaller in comparison with information on internet and home pages of higher education establishments;
5. Evaluations of foreign students did not differ statistically significantly by gender and age group;
6. Main general findings: first and valuable information and for deeper information acquisition important channel is higher education establishment webpage, then word – of – mouth, then social networks.
7. Higher education establishments have to pay more attention to information in higher education establishment homepages and social network sites.

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The paper was supported by the National Research Program 5.2. EKOSOC-LV

MERGERS & ACQUISITIONS IN THE GROWTH OF DIGITAL ECONOMY

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Abstract. The problem of defining the influence of digital economy to the economic growth and of mergers & acquisitions in recent decades as a remedy of restructuring economy in the environment of ICT development outburst reached the upmost scientific and practical importance. This has defined the aim of the paper – to determine the ways of influence and the level of correlation between mergers & acquisitions to cyclical economic growth. Research methods used were quantitative and qualitative analysis of factors and means of interrelation between the economic growth and mergers & acquisitions. Statistical methods - Pearson and Spearman rank correlation analysis were used. Main results and findings of the study have demonstrated that information and communication services sector's contribution with 4.6 % workforce in the EU producing only 8.3 % of value added of the total non-financial business economy create other main contributions of digital economy to the economic growth which cannot be measured quantitatively: the creation of increasingly expanding capabilities of distant management of companies. This creates the basis of extensive usage of mergers & acquisitions as the means for restructuring economies and increasing their efficiency in producing higher value added products and services. Important theoretical finding is that the volume of mergers & acquisitions does no increase steadily, has cyclical nature. This feature is determined by the combination of factors – more suitable digital environment and fluctuating market conditions and prices of companies. Practical implications of the findings are the possibility to increase accuracy of the forecasting of mergers & acquisitions intensity and the influence of this process to the economic growth. Conclusions of the research are confirmed by the empirical analysis of data from Baltic and Nordic countries.

Key words: *mergers & acquisitions, digital economy, business cycles, growth*

JEL code: F44, G34, O47

Introduction

Digital revolution has created new qualities of the Global economy. Barriers created by the distance between countries or districts gradually became less and less important. Possibilities to control distant subsidiaries are developing in geometric progression – volumes of accessible information and speed of processing gathered data made the control of corporate divisions much more efficient than decades ago. Foreign direct investments (FDI) and mergers and acquisitions (M&A) are undoubtedly gaining new horizons determined by the emerging digital economy. These processes have raised a lot of economic problems. Innovations are the main source of growth in industrialised economies and ICT is often a base for the innovations. Nevertheless, the scope of the influence of the digital economy to the economic growth is not defined. If macroeconomic analysis shows bigger influence of ICT to US than to EU growth, on the micro level such influence is difficult to reveal. As some researchers argue, "More theoretical and empirical research is needed to better understand spill overs and externalities of ICT and how these technologies transform our economies (Cardona M. *et al*, 2013).

The problem of defining the influence of digital economy to the economic growth and on mergers & acquisitions in recent decades as a remedy of restructuring economy in the environment of ICT development outburst reached the upmost scientific and practical importance.

This research problem has suggested the aim of the paper – to determine the main factors stimulating FDI and M&A expansion and ways of influence and the level of correlation between M&A and cyclical economic growth in digital economy context. Research questions are: what factors determine FDI and M&A expansion in digital economy? Are there waves of M&A and what are the reasons for them? Is it possible to trace the influence of the new digital environment to FDI and M&A by econometric methods?

Research methods applied were quantitative and qualitative analysis of factors and means of interrelation between the economic growth and M&A. Statistical methods - Pearson and Spearman rank correlation analysis were used. The empirical analysis of Baltic and Nordic countries data was used.

Factors of FDI and M&A expansion and digital economy

Institutional investors coming for M&A from countries with strong traditions of investments protection acquiring bigger stake of ownership are not hesitating to change less efficient managers, tend to significantly improve corporation management structures and procedures and often increase the value of company in future (Aggarwal R., *et al.,* 2011).

M&A often lead to a better usage of joint resources, higher internalization, and possibilities to increase market power. On the other hand, these gains are related with additional organizations merging costs for the acquirer what in combination with low M&A experience and capability, are often resulting in situations when "those both domestic and international acquisitions tend to reduce the performance of acquirers compared to non-acquiring firms" (Bertrand O. & Betschinger M.A. 2012). Problems in realisation of advantages of M&A found also Craninckx K. & Huyghebaert N (2011) – according to their data in Europe M&A failures happen in 50 % samples. "When acquirers and targets are listed, lower M&A announcement returns are consistently and significantly associated with higher M&A failure probabilities and long-term losses" (Craninckx K. & Huyghebaert N. 2011). M&A often increase capital concentration, market power, assets value; efficiency of merged companies is increased empowering new organisational structures and personnel changes. Sedlacek J. *et al* (2014) analysing Czech economy has proved that M&A are "dominated by the combinations where a larger company devours the smaller one with the objective to achieve a more advantageous position in the market and economies of scale."

Country specific financial environment is very important M&A decision factor. Companies from countries with faster growing securities market, with appreciating currencies more often are purchasers and companies from economically weaker countries become targets. (Erel I. *et al,* 2012).

Extremely important are legal regulations. Companies react to limits of expansion resources making different cooperative agreements, including M&A. In many developed countries such activities are resiliently monitored by regulating competition authorities. "The adoption of the Horizontal Merger Guidelines in the U.S. has caused organizations to flee from mergers to less regulated arrangements like alliances and joint ventures, and has hurt the profitability of the remaining mergers" (Drees J.M. & Heugens P. 2013). Income received due to mergers increased market power under the ideally efficient M&A control should be neutralised by the antitrust regulators, but this should make questionable the idea of M&A because it is impossible to separate effects of the market power growth from other efficiency gains.

Nationalistic policies in the European Union are rather widespread and expressed in economic nationalism regarding large corporate M&A decisions "in which the government prefers that target companies remain domestically owned rather than foreign-owned. This preference is stronger in times and countries with strong far-right parties and weak governments. And will have deterring effect on other foreign potential acquirers of M&A" (Dinc I.S. & Erel I. 2013). Other researchers found that cross-border M&As increase acquirers' domestic sales and investment and they do not increase unemployment

neither in acquirers' nor in receiving countries. Cross-border M&As in knowledge-intensive productions improve productivity in receiving countries. On the other hand, the results of Cross-border M&As depend on the motives of investment (Stiebale J. & Trax M. 2011).

Phalippou L. *et al* (2015) sees acquisitiveness "as one of the primary drivers of all the key aspects of the market for corporate takeovers: acquisition announcement returns, probability of deal success, propensity to acquire and be acquired." He explains that half of the negative acquisition announcement returns are caused by acquisitive targets, which are motivated as defensive "acquirers eat in order not to be eaten".

Some authors stress the significance of the overlap between the knowledge bases of the target and acquirer, which may have two different forms. The first one - the target's knowledge base is overlapping the acquirer's knowledge base. The second one - acquirer overlap, is when the proportion of the acquirer's knowledge base is duplicated by the target. In each case may be value creation by expansion of technological capabilities (Sears J. & Hoetker G. 2014). Other authors found huge negative impact of foreign acquisitions to innovation and research and development activities. The share of innovative production is not significantly affected by a foreign acquisition. "Hence, the estimation results do not provide any evidence of significant technology transfer through foreign acquisitions in form of a higher innovation success" (Stiebale J. & Reize F. 2011).

Ongoing creation of the European Single Market has reached the level of the very high integration of digital market earlier separated by national borders. Unified laws and rules are minimising local differences in intellectual property and consumer protection, e-commerce rules, data protection and competition lowering the barriers to internet trade and international investments. This determines increasing transfer of international trade and competition from traditional to virtual space. Definitely these processes not only create "The European Digital Single Market" (Alexandru P.D. *et al,* 2014), but are stimulating expansion of FDI and M&A due to stimulating retail and wholesale cross border shopping online enabling easier access to the information about prices, trade flows, advertising, competitive advantages of firms. The long term result of the lowering barriers to international trade and investments in the European single market will be the concentration of production and trade followed by the increasing growth rate of the European economy.

Digital economy has changed traditional notion of the importance of capital accumulation. If investment in production technology, machines, buildings, etc. were crucial earlier, brand names, patents, trade platform quality and reliability became the most important part of companies' value today. Offshoring based financial engineering – taxation planning attraction has enabled many leading companies to move operations or to offshore centres, or to countries with lighter tax burden. Have to be solved problems created by "the global double life of internationalised and financialised intangible assets and wealth flows, and parallel reorganisations of state forms in response to those transformations" (Bryan D. *et al,* 2017).

Digital economy is acquiring more and more features of the real economy. Even shadow economy moved to the Internet creating digital shadow economy which is defined as an "illegal operation in the Internet space, which generates illegal money flows for commodity/service providers or purchasers, and deprives legal traders/service providers from the revenue that could be officially accounted, calculated and declared" (Gaspareniene L. *et al,* 2017). As Grubor G. *et al* (2017), points out, seeking business excellence all organizations, big and small, should take measures against computer crime using services provided by specialists, digital forensic investigators. Even specific countries and entire world economy is in danger.

The Nature of the Waves of M&A

Garfinkel J.A. & Hankins K.W. (2011) found that waves of M&A emerge in attempts to control risk. Uncertainties provoked by economic downturns are easier to manage with vertical integration as a hedging instrument and the spread of this instrument usage starts M&A waves. Gugler K. *et al* (2012) does not agree with previous conclusion: "one of the most conspicuous features of mergers is that they come in waves that are correlated with increases in share prices and price/earnings ratios. Changes in the economy drive merger waves, as some neoclassical theories of mergers predict, both listed and unlisted firms should experience waves. We find significant differences between listed and unlisted firms as predicted by behavioural theories of merger waves". (Gugler K. *et al,* 2012).

Fu F.J. *et al* (2013) found that rather popular practice is to use overvalued companies stock to purchase less overvalued firms in reality leads to significant overpay for acquired firms, no synergy gains are got and the result is CEO compensations like the main target, not shareholders value growth.

Haleblian J. *et al* (2012) point out that the timing of participation in an M&A wave is very important, because earlier players receive gains comparing to the later ones and it is an important indicator of firm's strategic awareness-motivation-capability. Alexandridis G. *et al* (2012) have analysed the data of the sixth merger wave that started in 2003 and came to an end approximately in late 2007. They found that the main reason of this wave was the abundance of monetary resources, what, according to the neoclassical explanations cause merger waves.

Kastrinaki Z. & Stoneman P. (2013) have analysed UK merger activity between 1969 and 2005. They found aggregate cycles of 6 years duration in average and sequential average 5 year duration sectoral cycles of M&As caused by disequilibria or market misevaluation They suggested also that the capital market cycle alone is not causal for M&As cycles.

The neoclassical efficiency hypothesis and the misevaluation hypothesis validity were proved by Rau P.R. & Stouraitis A. (2011) who analysed corporate transactions in period from 1980 to 2004. They found that new waves start with new issue waves, equity offering, preceding initial public offering waves. Later follow stock-financed M&As waves tracked by repurchase waves. Other authors are arguing other possible reasons of mergers waves. Rodrigues V. (2014) the reason of mergers waves sees in "the interplay between the synergy opportunities offered by mergers and the possibility to free-ride other firms' mergers market power effects". Szucs F. (2016.) is arguing that "industry factors play a significant role in triggering activity and that M&A agglomerates strongly across related industries" and the main reason of M&As waves are industry shocks. Stock market according to this theory can have negative or positive influence.

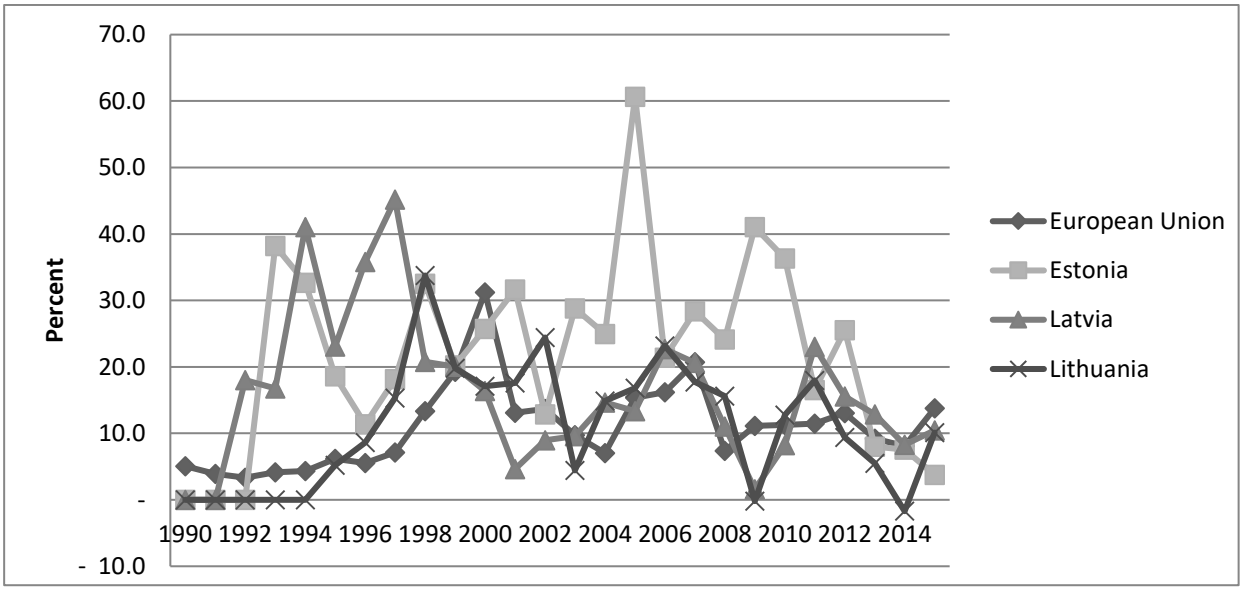
While mentioned above studies of M&A waves are mostly concentrated on microeconomic or industry level arguments, Uddin M. & Boateng A. (2011) pay the main attention to the macroeconomic forces on cross border M&As activities in the UK over the 1987-2006 period. They proved that "GDP, exchange rate, interest rate and share prices have significant impact on the level of outward UK CBM&As. On the other hand, GDP, money supply and share price have statistically significant impact on the UK CBM&As inflows."

The Internet expansion has provoked a new wave of economic growth. Gradual transfer of economic activities to the digital space enables small and big businesses to reach new markets, sometimes situated in very distant countries, what was almost impossible earlier, so revolutionary increasing the market size and competition. Digital economy expansion is facing specific for internet transactions legal problems (trade barriers) – unsolved problems of intellectual property rights protection when making international transfer of services and products, local discriminative protection of consumers, threat of biased liability of intermediaries providing e-commerce services. As point out Bieron B. & Ahmed U. (2012), "this type of transaction requires a revaluation of a trade regime that was created with only the largest

multinational corporations able to truly engage in international trade. The US has created trade policy governing cross-border e-commerce transactions largely through recent free trade agreements (FTAs)".

Research results and discussion

In this chapter we have tried to make a quantitative analysis of FDI and M&A data from the Baltic and Nordic countries in from the point of the existence of synchronisation of these processes between each other and the general EU development, whether waves of FDI and M&A exist and is it possible to capture the influence of the digital economy expansion on the FDI and M&A processes. Graphical analysis of FDI inflows as a percentage of gross fixed capital formation, 1990–2015, Baltic countries data (Fig. 1) suggest that in the European Union do exist waves of FDI having peaks (years 2000 and 2007) more or less coinciding with the turning points of the business cycle in Europe.

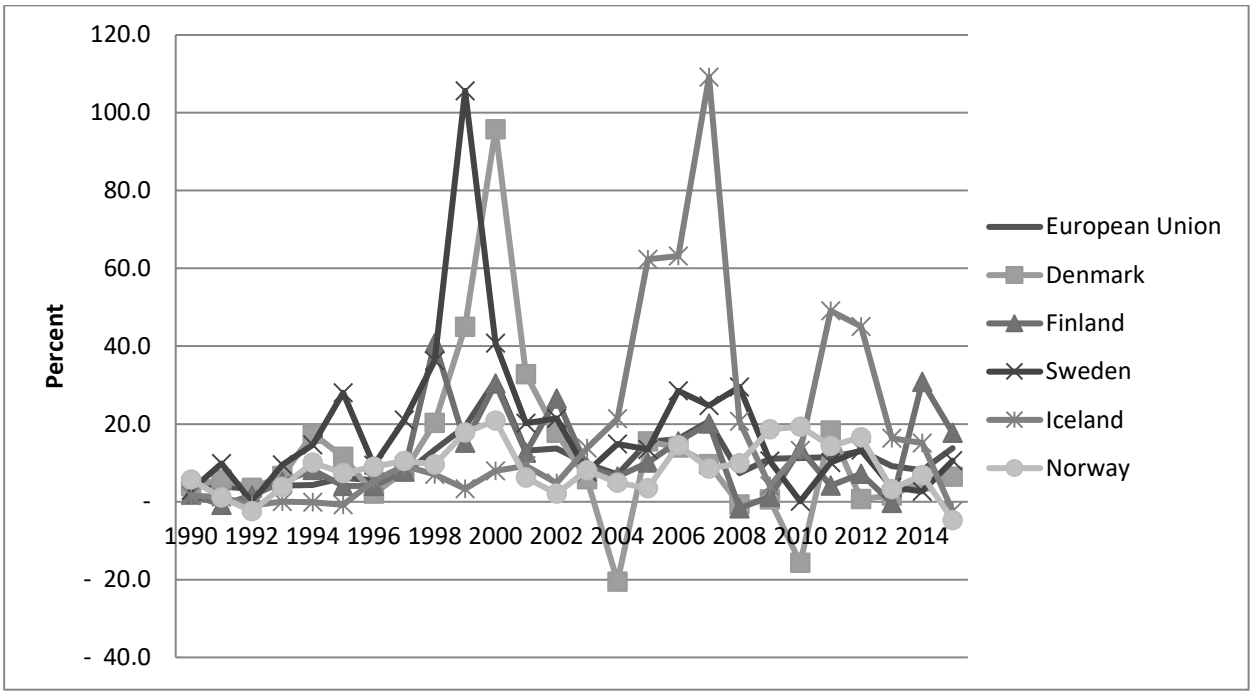


Source: author's construction based on Eurostat and UNCTAD data.

Fig. 1. **FDI inflows as a percentage of gross fixed capital formation, 1990-2015, Baltic countries**

Baltic countries also have developed peaks but they are asynchronous to the business cycle in Europe, shifted to later or earlier periods.

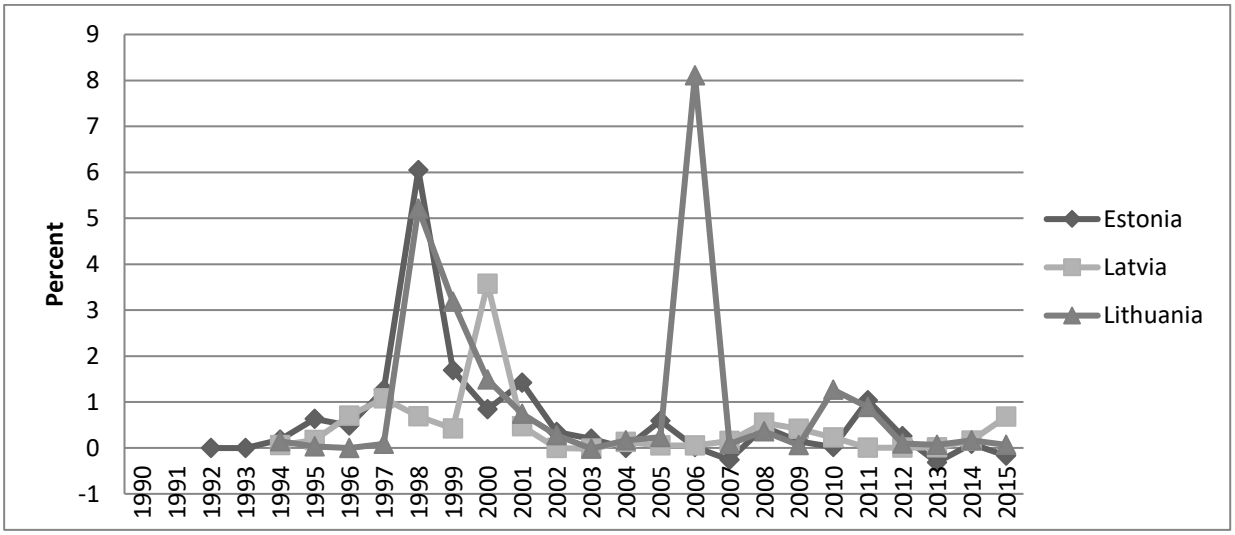
Presentation in Fig. 2 of FDI inflows as a percentage of gross fixed capital formation of Nordic countries reveals three extreme points – Sweden – in year 1999, Denmark – in 2000 and Iceland in 2007. All of these points are connected with financial services industry, but the consequences of these FDI peaks are different – for Sweden and Denmark they had positive impact to their economies due to perspective investments in Baltic Banking and Telecommunication industries allowing expanding control of them. Island banking sector suffered huge losses due to speculations in US secondary derivatives market.



Source: author's construction based on Eurostat and UNCTAD data.

Fig. 2. **FDI inflows as a percentage of gross fixed capital formation, 1990-2015, Nordic countries**

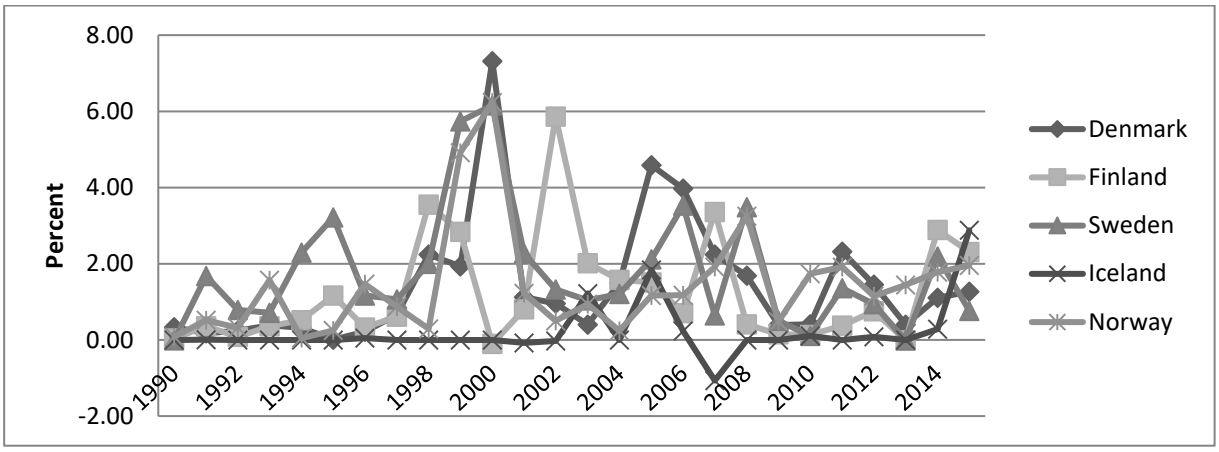
The analysis of M&As by region/economy of seller, as percent of GDP in Baltic countries is presented in Fig. 3. Peaks in Estonia and Lithuania coincide in year 1998 – privatisation of huge industrial companies and crisis in Russia. Peak of 2006 in Lithuania is determined by the acquisition of oil refinery.



Source: author's construction based on Eurostat and UNCTAD data.

Fig. 3. **Value of cross-border M&As by region/economy of seller, 1990-2015 as percent of GDP, Baltic countries.**

The next figure – Fig. 4, presents obviously wavy cross-border M&As in Nordic countries. Peaks are shifted relative to turning points of business cycle in Europe.



Source: author's construction based on Eurostat and UNCTAD data.

Fig. 4. **Value of cross-border M&As by region/economy of seller, 1990-2015 as percent of GDP, Nordic countries**

Pearson correlation analysis is not suitable for the analysis of such wavy developments.

Spearman coefficient of rank correlation r_s of GDP relation with cross-border M&As, by region/economy of seller, analysis (Table 1) is more suitable for the analysis of these processes.

Table 1

Spearman rank correlation analysis of GDP relation with cross-border M&As, by region/economy of seller, selected countries, years 1994-2015

Year	EU Rank GDP	EU Rank M&As	Estonia Rank GDP	Estonia Rank M&As	Latvia Rank GDP	Latvia Rank M&As	Lithuania Rank GDP	Lithuania Rank M&As	Denmark Rank GDP	Denmark Rank M&As	Finland Rank GDP	Finland Rank M&As	Sweden Rank GDP	Sweden Rank M&As	Iceland Rank GDP	Iceland Rank M&As	Norway Rank GDP	Norway Rank M&As
1994	22	22	22	16	22	18	22	19	22	20	22	17	22	11	22	9	22	22
1995	21	21	21	10	21	15	21	20	15	22	16	11	18	6	21	9	21	21
1996	20	20	20	13	20	10	20	21	14	21	18	18	14	17	20	8	17	13
1997	19	19	19	7	19	5	19	18	19	18	20	16	17	19	19	9	19	17
1998	18	11	18	1	18	7	17	2	18	8	17	5	16	10	17	9	20	20
1999	17	7	16	4	17	12	18	5	17	12	15	6	15	3	16	9	18	5
2000	16	2	17	9	16	1	16	7	21	2	21	22	20	2	15	9	16	2
2001	15	10	15	5	15	11	15	8	20	13	19	14	21	9	18	21	15	15
2002	14	15	14	12	14	21	14	11	16	14	14	2	19	15	14	20	14	18
2003	13	18	13	15	13	22	13	22	13	19	13	7	13	16	13	3	13	14
2004	12	12	12	19	12	13	12	13	12	11	12	8	12	13	10	9	12	19
2005	11	3	11	6	11	16	11	10	11	1	11	9	11	7	6	2	11	12
2006	9	4	10	18	10	14	10	1	10	3	10	12	10	4	4	5	10	11
2007	4	1	7	21	3	9	7	14	8	5	6	1	8	18	1	22	7	6
2008	3	6	3	3	1	2	2	6	1	6	1	13	5	1	2	9	5	1
2009	10	16	8	11	8	4	8	17	7	17	7	19	9	20	12	9	9	16
2010	8	17	9	17	9	6	9	3	6	16	8	20	7	21	11	6	6	9
2011	5	8	4	2	5	20	4	4	3	4	2	15	3	8	8	9	4	3
2012	7	13	5	8	6	19	5	12	5	7	5	10	4	12	9	7	2	10
2013	6	14	2	22	4	17	3	15	4	15	4	21	1	22	7	9	1	8
2014	2	9	1	14	2	8	1	9	2	9	3	3	2	5	3	4	3	4
2015	1	5	6	20	7	3	6	16	9	10	9	4	6	14	5	1	8	7
r_s	**0,55**		**-0,21**		**0,11**		**0,30**		**0,30**		**0,16**		**-0,15**		**0,16**		**0,64**	

Source: author's calculations based on Eurostat and UNCTAD data.

Conclusions, Proposals, Recommendations

1. When the degree of freedom is 11, the Spearman correlation coefficient has to be more than 0.6 for the hypothesis to be more than 95 % reliable. This means that the influence of GDP dynamics to value of cross-border M&As by region/economy of seller is not proved for the analysed countries with the necessary degree of reliability.
2. But peaks do exist. One of them is after one year of joining the European Union, in 2005, when the total cross-border M&As were one of the largest in the period of 2005-2015. Another type of deviations are individual huge projects.
3. Our research has confirmed that the volume of M&A and FDI do not increase steadily, have cyclical nature and are extensively used for restructuring economies and increasing their efficiency.
4. Influence of the digital economy development to stimulation of M&As and FDI was not proven quantitatively, but it is possible that current tendencies of M&As and FDI would not be accessible without the input of flourishing digital economy.
5. We suggest for further research the expansion of the scope of countries selected for the analysis including other OECD countries.
6. Proposal to make the digital economy more efficient is to fulfil the need for international investors in availability of information databases enabling better selection of M&A targets internationally.

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DIGITAL SINGLE MARKET CONDUCIVE TO THE PROMOTION OF SOCIAL DIALOGUE AND SOCIAL INVESTMENT IN THE REGIONAL COHESION CONTEXT

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Abstract. This article examines problems of the digital single market from two perspectives: the extension of a digital economy beyond capital, goods and services to other areas of the economy including labour markets, social dialogue and social dimensions, and from the role of digital government services in regional cohesion perspectives in Latvia. This methodological approach could serve as a tool for integrating a number of main goals related to the Digital Single Market (DSM), that require support of societies as well as the improvement of social welfare at the regional and national levels. This contribution aims to offer insight into the concept of social dialogue (SD) in DSM and the impact of the DSM on regional cohesion. The study observes these implications in relation to the need to expand and adapt the content and approach of the DSM implementation. The further digital development as a precondition for diminishing regional and wellbeing divide in Latvia is discussed. The role of electronic government services and social investment is examined based on the qualitative interviews among users of Unified state and municipal customer service centres (CSC)CSC in Latvia. The article provides recommendations to social partners for DSM regulatory system of decision-making as well as social investment for improving social welfare at regional and national levels. It is concluded that the digitalization and implementation of SDM have inevitably become more important due to the increased digital competitiveness of countries.

Key words: *digital single market, social dialogue, social investment, regional cohesion, digital government services*

JEL code: P25, O3, 035

Introduction

The social, economic, and political processes of the 21st century are characterised by mutual dependence and interaction, which clearly indicates the increasing complexity of these processes as well as the links between the various problems of society. Some of the most important factors affecting the global markets are: rapid technological development and economy measures taken by countries (ILO, 2013), as well as the trend to reduce production and labour costs [ILO, 2011]. In the EU, the Juncker Commission's aims at creating a DSM, with free movement ensured (EC, 2015). Its completion could generate economic and social benefits to Europe, notably by creating growth and jobs, improving productivity, reducing public spending and improving development of less developed regions in the EU and its Member States. The impact of the digital economy clearly extends beyond capital, goods and services to other areas of the economy including labour markets, society and its governance (OECD 2013).

To assess the social and economic situation in the EU relevant to the digitalisation trends, it is necessary to understand the role of social partners in discussions and consultations on the economic and social problems as well as development strategies at the regional, national and international levels. There is growing consensus that development of an efficient regulatory framework in the EU is essential for modernization of labour policies and their implementation in the digital economy and DSM market. In the current context of implementation of a DSM and the struggle to achieve economic growth, regional cohesion, employment, social investment and social justice, the role of social dialogue is essential in all

negotiations, either bi-lateral or tri-lateral and in the implementation of social innovation. The strong labour legislation, at the EU level relevant to digital era, protection of the basic rights of workers and social justice, is essential to prevent social dumping. The implementation of a DSM demands commonly agreed and implemented regulatory conditions for business environments and digital networks, and development of welfare systems at the EU Member States. Moreover, this issue is extremely significant for the current political debate. The EU explicitly recognizes the importance of these issues in "Europe in a changing world - Inclusive, innovative and reflective societies" (EC C(2016) 4614 of 25 July 2016). It is also a fundamental element, for example, in the implementation of the *Smart Specialization Strategies* (The Initial Position of Latvia, 2013) aimed at increasing the level of regional cohesion and to understand the reasons for limited growth in EU regions, especially in support to lagging regions. (S3 Platform Research and Innovation Strategies for Smart Specialisation (RIS3).

This article will make an attempt to better understand the numerous challenges affecting implementation of the DSM in the context of digital economy and related social dimension and regional cohesion issues.

Research Results and Discussion

The research shows clearly that digitalisation of economic and social dimensions has become an unavoidable subject in political and social debates, which is based on the current technological, social and economic tendencies. However, as revealed by literature review carried out by authors, there is a lack of consensus on the founding principles of the digital economy, its structures and their implementation (Valenduc, G., Vendramin, P. ,2016 ; Degryse, C., 2016; Tanel Kerikmae, T., Rull, A.,2016). Furthermore, scholars agreed that, digitised information, digitalisation and robotisation have become a strategic resource for economies and their competitiveness and digital networks - the fundamental organising principle of the economy and society as a whole. In addition, there is a never-ceasing search for new types of work organisation that would allow for more efficiency of the labour market in a platform economy and rising of digital competitiveness of the participating parties as pointed out in the a EU document "A Digital Single Market Strategy for Europe" (COM/2015/0192 final). The main areas of concern with regard to these service platforms are the trend towards deregulation and the failure to respect the employment relationship, employment contracts, collective agreements, wages, etc. (Degryse, C., 2017). With respect to the supply of local services, new players and approaches to state services have appeared. More extended discussion is given in the following sub-chapters that are focused on an assessment of DSM trends, its fundamental principles while, for example, considering social dialogue (SD) concept in DSM and the impact of the DSM and social investment on regional cohesion by reducing the digital regional divide in Latvia while applying different measures and viewpoints.

First, we pay attention to the growing consensus in the EU that development of an efficient regulatory framework is essential for modernization of labour relations through regulatory measures and their implementation in the digital economy and DSM. This article will discuss the current developments related to the position of social partners in the system of decision-making processes related to the management of legal structures.

Secondly, we attempt to identify the need in the current context of implementation of a DSM and the struggle to achieve regional cohesion and social investment, for social dialogue in the DSM that is essential in all negotiations, either bi-lateral or tri-lateral, and in the implementation of social justice.

Thirdly, using the results of the available relevant studies, authors discuss and demonstrate the need to commonly agree on regulatory conditions in implementation of a DSM in regional context for further cohesion and thus an increase in wellbeing at all levels.

Finally, we discuss the digital development in Latvia as an indicator of competitiveness and digital government services in Latvia, pointing out reasons for digital regional divide based on the case of applying e-services in the context of social investment and wellbeing.

1. Digital Economy and Social Partner Involvement in the Digital Revolution

The trend of digitalisation is transforming both manufacturing and service industries. As a result, societies in the EU face tremendous opportunities and challenges. According to Eurostat, Europe's high- tech industry and knowledge-intensive services are increasing with record levels of investment in 2016 (Eurostat, 2017). Many parts of the EU led the world in e-government, demonstrating high levels of electronic engagement with their citizens and in using digital technology to update public services (UN, 2016). However, there are high regulatory impediments that do not allow EU member States to reach the levels of many world economies. The implementation of the DSM as well as content industries needs to find a substantial way of recreating their business models. According to experts, European policymakers must avoid fragmentation in digital sectors. Instead of creating a unified DSM, many stockholders take an opposite position to the EC proposals. For example, the Commission' s new telecom rules could force messaging apps (a 'European Electronic Communications Code', Council of the European Union. Press, 9 June, 2017 Luxembourg), which now offers all Europeans the same service. Participants felt strongly that net neutrality rules should be reinforced to ensure non-discriminatory access to content. More broadly, the EU should emphasise the role of openness and collaboration by providing open access to the results of publicly funded research, promoting open science, engaging more transparently with citizens and endorsing open innovation models to tackle societal challenges and long-term goals (EPRS, 2014). Although the EC promised to create a SDM as one of the Commission' s priorities, estimating that it could boost the EU' s economy by 415 billion euros annually (EC, 2015) there is a little optimism among stockholders about achieving this goal. Many believe the digital regulations proposed will move in the opposite direction and increase fragmentation. The staunchest critics see the SDM measures favouring traditional corporatist old industries.

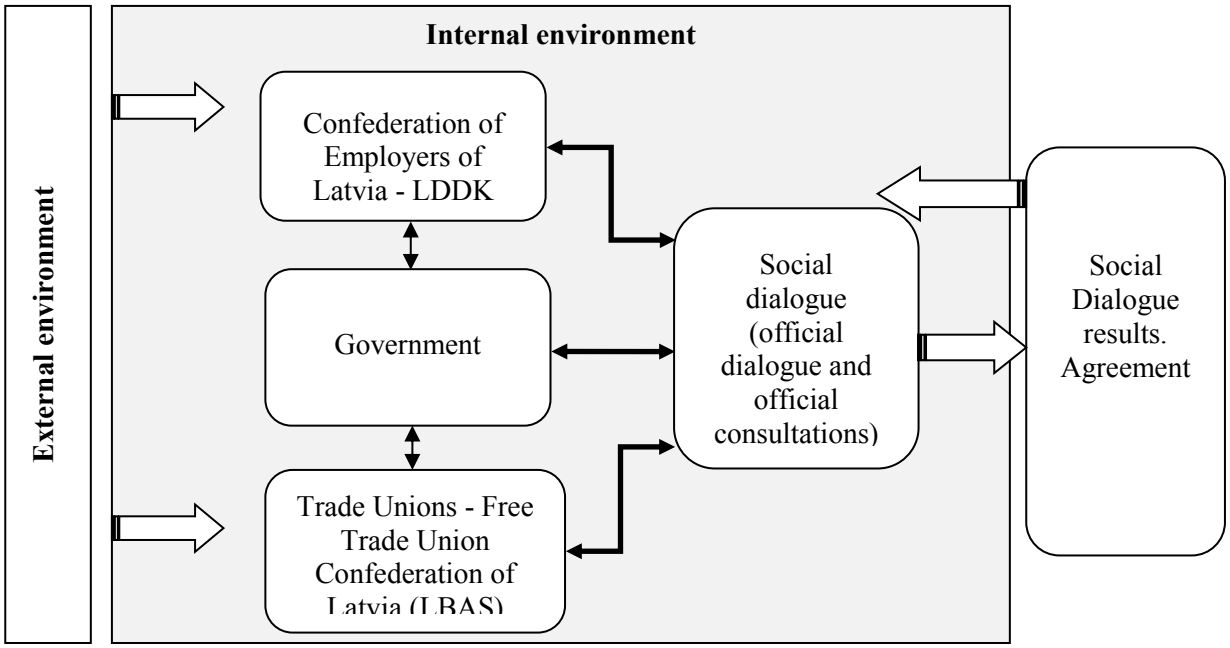
Despite the fact that high quality public services constitute the backbone of citizens' social welfare as well as a region's competitiveness and entrepreneurship, their provision faces significant challenges today. This is also acknowledged in the European Digital Progress Report: Review of Member States' Progress Towards Digital Priorities (EC, 2017). Also, challenges of using e-government services are revealed by results of conducted interviews in the framework of the CITADEL project and the outcomes of a study on the use of these services[1].

The concept of the social partnership and social dialogue (SD) is a core element of the industrial relations specifically in the SDM. One fundamental principle of the authors' observation is the need to study the genesis of legal structures developed in the International Labour Ogranisation (ILO) context as SD has gained significant importance in public debates internationally only in recent decades, and is grounded in the mandate and activities of ILO covering rights at work, employment and social protection. Social dialogue and social security also became fundamental elements in the European Social policy, thus the EU could serve as an example of analysis of main trends in the development of social dialogue and social partnership as well as relevant social innovation at the EU and Member State levels (Official Journal of the European Union, L 347/238, Regulation (EU) No 1296/2013).

In order to better understand the role of social partners in discussions and consultations on the economic and social problems in general, and in relation to the DSM in particular, a discussion about future social risks in digital environments is needed. It is worth mentioning that trade unions are one of the leading actors in these consultations, as they appear to

[1] CITADEL project is being implemented under the "Horizon-2020" programme, Grant agreement No 726755

be an important partner for governments trying to take measures necessary for gaining and strengthening the digital trend in economic development while maintaining social guarantees and protection. In addition, trade unions in the DSM already have contributed by way of collective actions in organising representatives of small enterprises as well as free lancers in unions and pursuing social dialogue with administrative structures at regional and EU levels, thus mitigating the consequences faced by the digital environment. Work on governance change is occupying an increasing pre-eminence in the European social dialogue. A special attention should be given to organisations and unions of individuals and organisations who are heavily involved as social partners in the European social and inter-sectorial dialogue while participating in the public administration decision-making process.



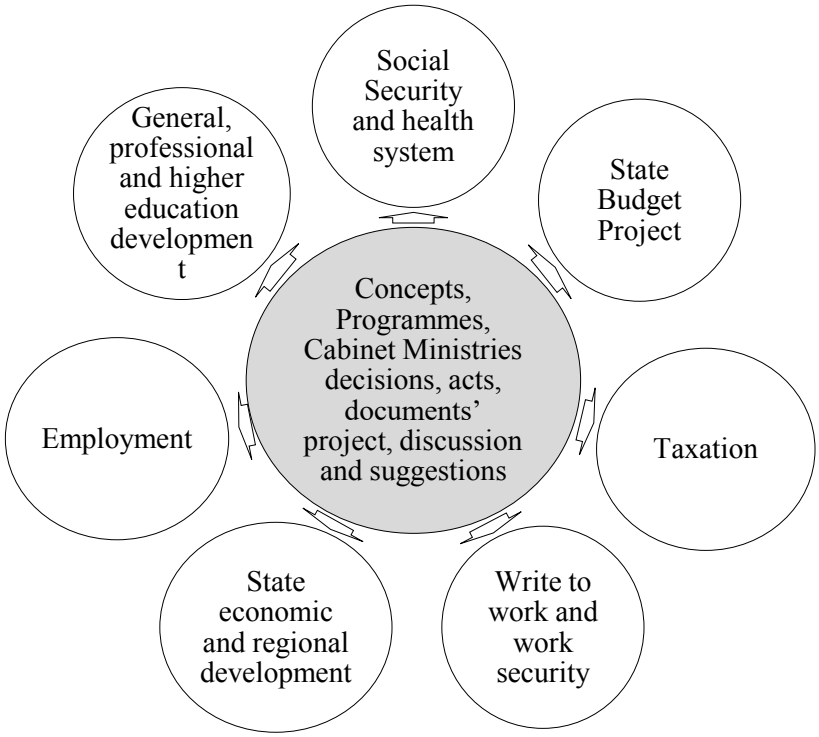
Source: developed by the authors

Fig. 1. **Social dialogue and the external and internal factors affecting it in Latvia**

Social dialogue within the social partnership is based on general agreements (collective agreements). General agreements on the sector level are more popular in Latvia in the public sector (education, health care), as both employers and trade unions are better organised in the public sector.

Implementation of social dialogue in the private sector is hampered, as there are no traditions of joint representation of employees' interests by way of trade unions at small and medium-sized companies. In addition the regional trilateral cooperation is undeveloped in Latvia. Activity and operation of employers and employees' organisations in regions is fragmentary, which could be explained with the low economic activity and inefficient public sector in regions of Latvia. At the regional level, the strongest bilateral and trilateral social dialogue is in Riga Region; this can be explained with an intensive and dense entrepreneurial activity. The most important issues that could be solved at the regional level that are influenced by the digital environment are: decrease of unemployment and qualification and re-qualification of the labour force. Within the social dialogue, trade unions represent the interests of employees at both governmental and administrative institutions.

The development of the institutional and legal basis as well as the influence of the EU on the public administration decision-making process have helped to create a new model of trade unions in Latvia and other Central and Eastern Europe countries — trade unions that have transformed from the model "a trade union in which a state plays a decisive role in shaping the parameters of trade union practice" to "a trade union that is the state's social partner". (Stacenko, S., 2014).



Source: the figure was developed by the authors

Fig. 2. **Public administration decision-making process in social partnership**

Social partners' capacity to reach compromises on issues for which employers and employees hold opposing views has allowed them to take up powerful positions in society, as evidenced by their role in collective bargaining on wages and working conditions. Europe's markets are currently undergoing significant changes, driven by digitalisation and technological progress. As existing jobs disappear or are being significantly transformed, social partners may play a critical role in ensuring that the benefits of these advancements are reaped, while protecting those most affected.

Based on the SD, social partners' mandate is to bring forward recommendations about digital technologies, robots, etc. In some EU member States the preparation of action plans or roadmaps is already taking place: the Czech Republic, Denmark, Germany, Italy and Spain (Vogel, S., 2017). It is a high-level affair with the lead of governments. Social partners have been involved, to differing degrees, in formulating such plans. However, their ideas have not necessarily been implemented, as the topic is often regarded as a very new one. In addition, digital change relates to many different areas; not only to companies and the labour market, but also to: investing into future industries and accompanying infrastructure at a national scale (industrial policy); societal issues (education, demography and an ageing society) and legal issues (data protection and labour law). These countries have also looked at the links between digitalisation and national industry models, especially manufacturing. All four countries have developed an Industry 4.0 strategy.

One of the aims for social partners should be mapping the main social risks caused by digitalisation of economy, for example fragmentation of the labour markets in terms of digital labour, freelancers, crowd workers or management in terms of digital surveillance, data protection, transparency etc. The social partners in general and trade unions in particular are very likely to be increasingly confronted by a dilemma as platform capitalism develops weather to protect existing jobs or to support their social partners in organising new digital economy jobs.

Nevertheless, trade union membership is in sharp decline and similar trends are reported for employer representatives. At the same time, new forms of representation have emerged. Co-creation is becoming a growing interest topic for

scholars. From a public point of view, co-creation is viewed as an engagement process in which citizens play an important role in providing productive inputs to increase the level of quality and quantity in public services whilst reducing costs.

2. Social Investment and Regional Cohesion

In the previous sub-chapter we outlined the concept of social dialogue as a core element of the industrial relations specifically in the DSM. Another significant factor that influences social development and wellbeing in the digital era and new business environment in the DSM is the social investment concept, which is the subject of current discussions at the EU level. Recent studies (Grootaert, Ch, Van Bastelaeer, T., 2001; Morel, N., Palier, B., Palme, J, 2012) have indicated the potential for social investment and highlighted differences in outcomes across EU Member States that have implemented different welfare state models. The main comparative theoretical approaches employed regarding the emerging of the social investments paradigm are Neo Keynesianism and Neo Liberalism (Morel, N., Palier, B., Palme, J., 2012). Social investment should contribute to the development of innovative approaches related to the competitive business environment and digital market in the EU and its Member States. It also should contribute to regional cohesion. An in-depth analysis of the scientific literature, legal and policy documents of international institutions elucidating the various versions and meanings of social investments, such as the paradigm of New Institutional Economics, the World Bank's "Social Capital Initiative" (Hemerijck, A. and Vandenbroucke, F., 2012) and others. The mainstream scholars view social investment as a strategy highlighting the shifting internal equilibrium between: public expenditure, private expenditure and banking tools that are identified as "social investments". The above approach to social investment is fundamental for the EU regional cohesion policies. The most important instruments in reducing regional disparities are the European Commission's funds such as the European Fund for Strategic Investments and the Employment and Social Innovation Programme (Official Journal L 169/1 Regulation (EU) No 2015/1017). However, the contribution of these funds to reduce regional disparities in the current context of digitalisation and high unemployment in EU economies and associated social risks requires new actions by governments and social partners. The governments are looking for new sources of growth to boost the productivity and competitiveness of their economies and industries, to generate jobs and to promote the wellbeing of their citizens. As highlighted in the (OECD, 2014a) Ministerial Council Statement, governments have to respond to the rising inequality as it could endanger social cohesion and hamper the economic resilience and inclusive societies. Furthermore, governments will need to anticipate and address the need for regulatory structures development to minimize disruptive effects of challenges in the digital environment such as privacy, new jobs, intellectual property rights, competition and taxation.

The relationship between information technologies (IT) and economic development of peripheral territories and industrial areas has been of interest for scholars. In this respect, more attention should be given to a digital regional divide existing in many economies. The term "digital divide" refers to the gap between individuals, households, businesses and geographic areas at different socio-economic levels with regard to both their opportunities to access information and communication technologies and to their use of the Internet for a wide variety of activities (OECD, 2001). The digital assessment of regional development has been subject of scholarly articles (Baskaran and Muchie 2006, Hogan,A. and Young, M.,2015) with the main conclusion that the lack of digitalisation is not necessarily the cause of social and economic under-development phenomena of regions, but is a consequence of low social and economic status in terms of regional geography and wellbeing. The lack of information technologies and digital infrastructure as well as digital knowledge, skills and practices are is likely to reinforce initial social inequalities.

3. Digital Competitiveness and Regional Digital Divide in Latvia

The digitalisation trends and development of a platform economy impact developments of social collaborative technologies and scope of e-participation on societies. Although citizen participation has already been studied by scholars regularly, there is a lot of interest in better understanding the role of customers in certain public sectors in order to provide methodologies and tools for enhancing co-creation in public services where technology is a requirement.

In 2017 the IMD World Competitiveness Center introduced the IMD World Digital Competitiveness Ranking, which measures a country's ability to adopt and explore digital technologies leading to transformation in government practices, business models, and society in general. The significance of digitalization is stressed by a strong positive correlation of this ranking with results of the Global Competitiveness Report.

In the World Digital Competitiveness Ranking Latvia holds 35th position among 63 countries analysed. At the same time Latvia ranks 41st in terms of future readiness which indicates a country's preparedness for digital transformation. The three main factors, which determine future readiness are 1) Adaptive Attitudes (Latvia – 41); 2) Business Agility (Latvia – 46) and IT Integration (Latvia – 36). The Adaptive Attitudes indicator shows the willingness of a society to participate in digital-related processes. The Business Agility indicator reflects the ability of firms to transform their business models in order to take advantage of new opportunities. It also relates to the level of business innovation. These are the main areas Latvia would have to improve to advance digital and overall competitiveness, as well as to reduce digital divide (IMD, 2017).

Europe's digital performance is measured by the Digital Economy and Society Index (DESI). According to DESI 2017 Latvia has strongly increased shares of broadband subscriptions and improved delivery of public services. Fixed broadband connections are widely accessible, while only 55% of rural households of Latvia had fixed broadband connections in 2015 (EU-91%). Also, the use of e-Government services has been gradually increasing, which has been greatly facilitated by implementing CSCs in major regional centers of Latvia since 2015. At the same time, according to DESI, around half of the population has low or no digital skills and businesses are exploiting technologies in a limited way (EC, 2017)..This indicates that much greater cooperation of national government, regional and local administrations with society and businesses is required to co-create better services and increase participation in digital processes.

Discussion related to the demand for high quality public services that constitute the backbone of citizens' social welfare as well as a region's competitiveness and entrepreneurship was elaborated by authors during 2016-2017 in the joint research conducted in the framework of the H2020 CITADEL project "Empowering Citizens to Transform European Public Administration" and International Institute for Management Development in Switzerland. The research has a main focus on electronic government services for non-users. The 141 short interviews provided a total of 279 text fragments to be analysed. The assessment of reasons for non-use are related to socio-demographic characteristics based on the research done in eight regional CSCs. Five of eight CSCs, where interviews were conducted are located in remote areas close to Latvia's external border: Viļaka CSC, is located near the border with Russia; Ape and Strenči CSCs are located near the border with Estonia; Auce CSC is close to the border with Lithuania; and Dagda CSC is near the border with Belaruss. Two of 8 CSCs – Carnikava and Roja, are located near the Baltic Sea. In all cases CSCs are located in centres of regional significance. Broadband connections in these areas are not as good as elsewhere in Latvia and the Internet is not accessible everywhere. According to the Eurostat only 75% of rural households had access to Internet by broadband connection in 2016 (Eurostat, 2017), which makes a negative impact on the use of Internet and public services, as well as on the computer literacy of inhabitants.

People living in these areas are accustomed to having a lower income level and many households can't afford computers and Internet at home. Seven of eight selected regions have from 3444 inhabitants in Strenči to 8884 inhabitants

in Carnikava. Only one – the Salaspils region - has 23 432 inhabitants. Taking into account that most of the visited CSCs are located in remote rural areas, this factor makes an impact on the income level and education level of respondents, as well as on the accessibility of computers and Internet, as well as knowledge and skills to use them. Customers visit CSCs and do not use Internet services individually for several non-use related reasons: low or absent skills and competence, and the perceived lack of them. The technology and complexity of entering data to request services, especially in the cases of State Revenue Service or State Social Insurance Agency systems, make these customers afraid, especially to make mistakes. Many of the people reporting lack of skills also mention not having a computer or a scanner and a scanning service is their reason to visit CSC. Respondents find the system too complicated, and in some cases contrasted this with the simplicity of just visiting the CSC. Yet, we do not find evidence that persons labeling the system as too complicated have already used it before. This means concerns about the complicatedness of the system are likely to be a perception issue rather than an experience-related issue. This is further confirmed by the fact that 16 out of 40 higher educated respondents also mention skills and the complicatedness of the online system as a reason to come to the CSC. Some respondents indicated visiting the CSC in order to obtain information about using the online system. Several respondents mentioned a lack of Internet access as a reason for coming to the CSC and some reported on the complexity of the electronic system. An educational effect is another indicator for non- using e-services. Most non-users have only a degree in secondary education. Another group of reasons related to non- use are convenience and support: a lack of interest or need to use the electronic service. In particular, the fact that it was still possible to submit required documents on a paper, and that the CSC alterative was available anyway and free, makes customers visit the CSC. Respondents also mention geographic proximity of the CSC (close to home and to the place of work) as a reason for using the CSC. A related factor is that respondents can receive in-person help at the CSCs. Staff at the CSCs are seen to be experienced and as knowledgeable. Respondents also cite the possibility of asking additional questions and getting additional help, both about using the system and about the services sought. The following assumptions that produce digital regional divide in Latvia have been made: low income individuals that are unable to have Internet and computer, level of education that affects personal desecion- making and peoples' abilities and interest to use electronic services. Taking into account that education level also very often impacts the income level of people, then less educated people are less likely to spend money to buy computers and pay for the Internet. Another factor influencing the use the electronis servises is age. We have observed that individuals of about 50- 65 years old tend not rely on e-services. The complexity of the electronic system and fear of making a mistake, as well as a lack of understanding of the procedure have a strong negative impact on the use of the electronic services. An important factor in rural areas is the desire to discuss the procedure in person and receive help. This is also a way of socializing especially for older people or unemployed, who have the opportunity to meet other people with similar problems and/or interests and discuss them. The state subsidies for cheap Internet and computer access for people with low income in rural areas, and extension of broadband to cover 100% of Latvia is needed for regional cohesion and to minimize the digital regional divide. Training courses for learning to work with online services rather than just offering offline alternatives are also required. In addition, simple courses for people to do Internet banking in cooperation with commercial banks would also be needed and could help to understand how to access and use government services on-line as cccording to the Eurostat 62% of people used Internet Banking in Latvia in 2016.(Eurostat, 2017).

Conclusions

1. Nowadays, development of efficient regulatory conditions for operation of social dialogue and investment is essential for the development of a DSM— preparing and taking business decisions in digital business environment is continuously increasing.

2. The research discussed the current developments related to the position of social partners in the system of the decision-making process related to the DSM. The authors concluded that there is an urgent need for elaboration of the methodological basis of industrial relations relevant to the DSM and digital business environment by applying a comparative approach to definitions and functions of a digital or a platform-based economy and the genesis of legal structures, developed by the International Labour Organisation (ILO) and EU in the context of a digital market.
3. Development of a concept of the social dialogue as a core element of the industrial relations with a focus on digital economy and specifically on the DSM. Furthermore the authors suggest to stress in social research a distinct understanding of the social investment and the role of the European Commission's funds affecting the social dialogue and investment in digital networks and development of welfare systems at the EU and Member States level.
4. In the assessment of the current developments related to the position of social partners and relevant in the regulatory system of decision-making process linked to the social dialogue and investment, the authors concluded that regulatory principles of the DSM are key elements in the effectiveness of the labour market's development, employability and the decision -making process in the DSM at the regional and national level.
5. Since the emergence of the Internet, the digital divide has become an enormously popular concept. Great inequalities in IT implementation, uses and skills exist. The digital divide has several dimensions: social, economic and political. Poor or less educated people, and people leaving in rural areas show low IT indicators. There is evidence that low- income people, communities and regions are only partially digital.
6. Digitalisation and technological infrastructure are considered and important indicators in competitiveness of countries and regions.

Acknowledgments

Discussion related to the demand for high quality public services that constitute the backbone of citizens' social welfare as well as a region's competitiveness and entrepreneurship discussed is elaborated during 2016-2017 by researched of the Centre for European and Transition Studies at the University of Latvia: Tatjana Muravska, Zane Zeibote and Sergejs Stacenko in the framework of the H2020 CITADEL project "Empowering Citizens to Transform European Public Administration" (Grant agreement No 726755) under the leadership of TECNALIA technological corporation and IMD World Competitiveness Project, 2017.

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FOSTERING RESEARCH, INNOVATION AND DIGITALIZATION IN EUROPE AND LATVIA

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Abstract. The contribution of higher education to jobs and growth, and its international attractiveness, can be enhanced through close, effective links between education, research, and innovation – the three sides of the 'knowledge triangle'. In addition, digitalization serves as a catalyst for closer integration of various elements within the 'knowledge triangle'. In this paper, the main focus is placed on research, innovation and digitalization performance in the EU member states and their financing from the different European instruments.

This paper presents the rationale behind the EU Investment Plan, evaluates the current research, innovation and digitalization performance of Latvia from multiple perspectives, looks at the economic consequences of innovation activity, and provides an overview of the EU innovation support instruments relevant for Latvia. The paper concludes that besides funding, the inherent quality and marketability of research projects remains essential.

As regards digitalization, Latvia has relatively developed connectivity and infrastructure, but is increasingly facing shortage of skilled ICT professionals and integration of internet-based solutions in business operations, especially among SMEs, is below its EU peers. Latvia ranks 19 from EU-28 in Digital Economy and Society Index 2017. Overall progress is driven by increasing shares of fast broadband subscriptions as well as by the improved delivery of public services. More and more Latvians are going on-line and are using eGovernment services but still half of the population has low or no digital skills. Latvians are increasingly shopping online but businesses are exploiting technologies in a limited way.

The paper concludes that, for innovations to flourish, investment is, no doubt, a necessary pre-requisite, globally, in Europe and in Latvia. In this context, the national governments are responsible for a reasonable budgetary spending for research, but even more for creating conducive framework conditions – such as fostering private enterprise, creating a vibrant eco-system for start-ups, fighting shadow economy and improving the business environment. The EU stands ready to offer multiple support instruments, ranging from Investment Plan to Structural Funds, to Horizon 2020, and to InnovFin. However, even when financing is available, it is up to the research community to make good use of them.

Key words: *digitalization, ICT, innovation, investment into R&D, research*

JEL code: O30

Introduction

A political consensus exists in the European Union (EU) that to ensure sustainable growth and well-paid jobs in the economy, sufficient and high quality investment into research and innovation is a *sine qua non*. Thus, innovation is a crosscutting, horizontal priority of the Juncker Commission.

Evidence suggests that public and private investment into technological innovation in the EU continues to lag behind its global competitors, such as the United States and Japan. To reach its self-established objective of 3% of GDP targeted to funding research and innovation (R&I), the EU ought to boost its investment by 130 billion per year, according to European Investment Bank calculations (Jan Vapaavuori, 2016). Even though some EU member states, such as Sweden

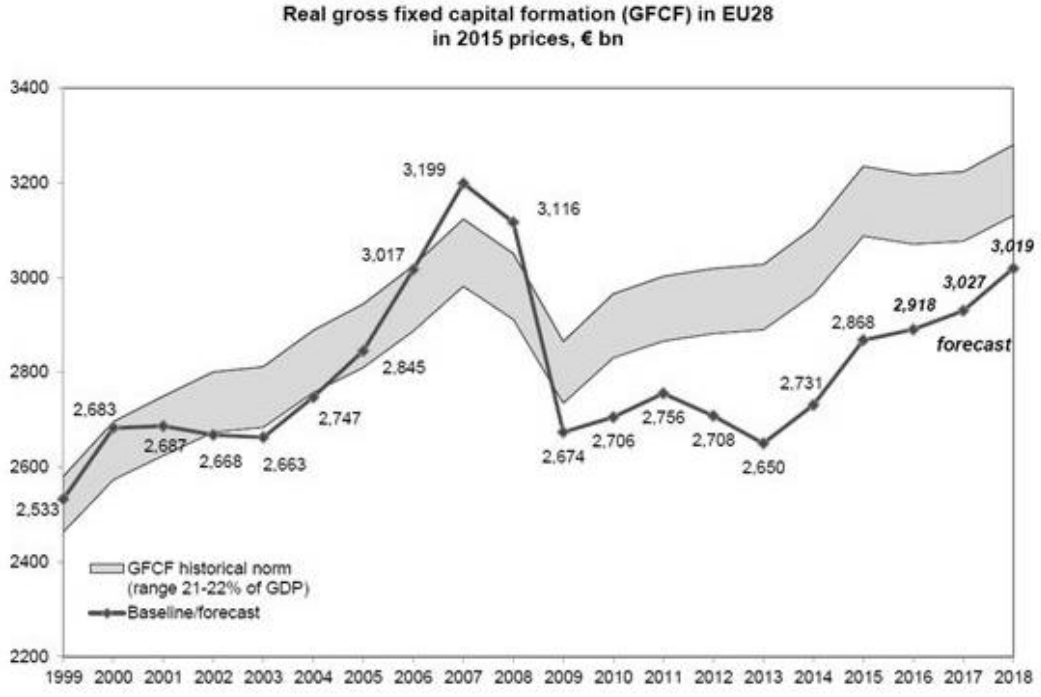
and Finland, exceed the EU-level objective and rank among global competitiveness leaders, the others, like Latvia, are lagging behind (European Commission, 2017c). Latvia has long suffered from under-investment in research. Lack of financing leads to a limited number of excellent research projects, outdated technologies and depleted human capital, which, consequently, erodes future growth potential.

To remedy the investment gap, stimulate the private sector contribution and help to connect funding with projects, the EU has proposed an ambitious Investment Plan with innovation as one of its priorities. The EU has also significantly increased budget allocation for research, for instance, *Horizon 2020* has seen a 30% increase in real terms in comparison with its predecessor – Framework Programme 7. Furthermore, the EU has introduced new principles, such as 'smart specialization' and 'thematic concentration', which prioritize support for innovation through European Structural and Investment Funds (ESIF).

To unlock the potential of data economy and build a true knowledge society, the EU has also proposed a host of measures to enable better functioning of the Digital Single Market (DSM). These measures are focused on improving access to the market, creating the best and most secure digital environment and driving jobs and growth through high industry standards and up-skilling.

EU Investment Plan

The global financial and economic crisis left deep scars on the face of the European economy. The total volume of investment fell by about 430 billion EUR between 2007 and 2013, representing a 15% drop (see Figure 1). More than 6 million people in Europe lost their jobs. Although investment has picked up in some countries and some sectors, despite low lending rates, quantitative easing measures and sufficient liquidity in commercial banks, the investment remains well below the sustainable trend (21-22% of GDP), witnessed before the financial crisis. With the exception of Germany, investment has lagged behind the United States in many European economies – France, Italy, Spain, and Netherlands, to name a few (European Commission, 2017c).



Source: European Commission - based on 2016 Autumn forecast

Fig. 1. **EU investment (private/public) trend**

Collective and coordinated efforts at the European level are needed to reverse trends of falling investment and put Europe on the path of economic recovery. Adequate levels of resources are available and need to be mobilized across the EU in support of investment. Although there is no single, simple answer, no growth button that can be pushed, and no one-size-fits-all solution, the European Investment Plan is seen as a powerful instrument to mobilize investment.

In fact, to draw from a historical parallel, the rationale behind the EU Investment Plan, also labelled as "Junker Plan" by journalists, is not unlike the one of the Marshall Plan after the Second World War. Both aimed at kick-starting the economy by providing liquidity for reconstruction and modernization, and both are named after the "architects" of this economic policy.

The Investment Plan focuses on removing obstacles to investment, providing visibility and technical assistance to investment projects and making smarter use of new and existing financial resources. To achieve these goals, the plan is active in three areas (European Commission, 2017b):

- mobilizing investments of at least €315 billion in three years (and up to €500 billion by 2020);
- supporting investment in the real economy;
- creating an investment-friendly environment.

The Investment Plan is one of three elements in the “virtuous triangle” of economic growth. Annual Growth Surveys of the EU in both 2015 and 2016 stressed the need for three-pronged approach: (1) using public money as a catalyst for private investment; (2) pursuing structural reforms to modernize member state economies; and (3) continuing to adhere to fiscal responsibility (European Commission, 2016b). The focus areas of Investment Plan, corresponding to the key economic drivers, include: (a) broadband, energy and transport networks; (b) education, research and innovation; (c) renewable energy and energy efficiency; (d) youth employment; (e) SMEs and mid-cap firms.

There is a notable break with the past. While previously the EU pursued its policies with the primary aim of achieving better cohesion among member states and awarding subsidies (grants) as its method of operations, increasingly more market-based financial instruments are being used. Financial instruments are based on the idea of leverage and multiplier effect. Successful projects generate revenue, which can be re-invested. Public guarantees allow multiplying private money generating more "financial mileage" than grants alone. In the era of diminishing EU budgets, this approach reflects to the imperative to “achieve more with less”.

Managed by European Investment Bank (EIB), the European Fund for Strategic Investments (EFSI) mobilizes private sector funds towards strategic investments by providing investment guarantees. It facilitates access to finance for SMEs by supporting EU’s flagship entrepreneurship and innovation fund: European Investment Fund (EIF). In addition, the European Investment Advisory Hub (European Investment Advisory Hub, 2017) offers a central point of contact for technical and financial advice for project promoters and investors. Furthermore, the European Investment Project Portal (European Comission, 2017a) helps to match potential investors and project promoters.

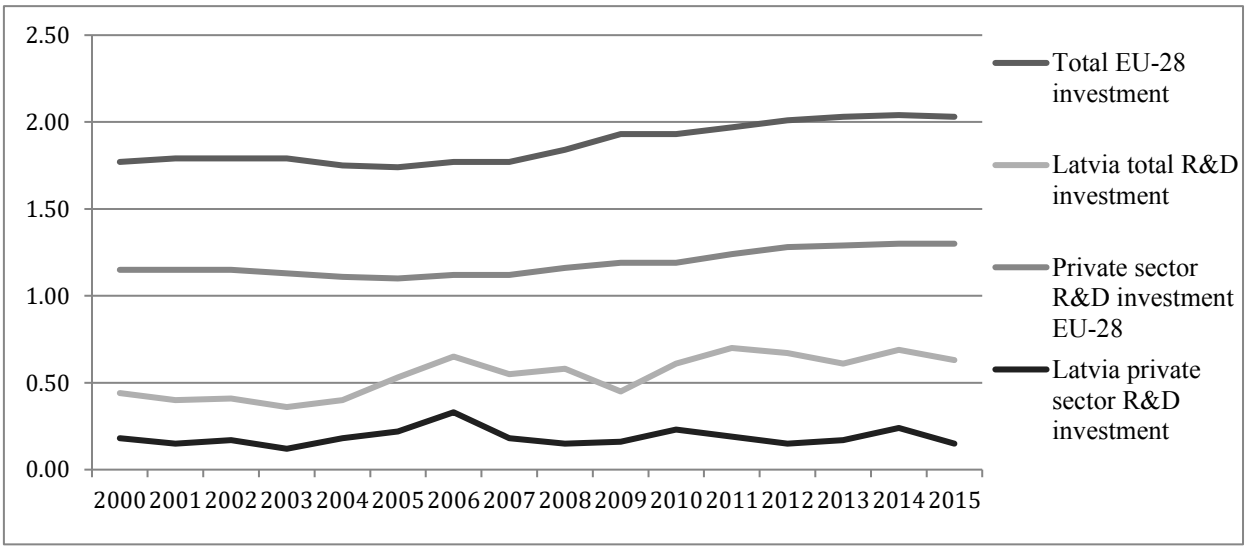
By April 2017, 34 billion EUR of financing has been already approved by the EIB and EIF, expecting to trigger a total investment, including from the private sector, of more than 183 billion EUR. Among infrastructure and innovation projects, more than 190 have been approved, while 255 SME financing agreements for a total of 8 billion EUR have been signed.

For instance, Latvian development institution Altum signed an *InnovFin* agreement with EIF late in 2016, and has already issued project guarantees to 4 RDI (research, development and innovation-intensive) enterprises based in Latvia, including *HansaMatrix* and *Intelligent Systems*. Swedbank in Latvia signed a *COSME* agreement with EIF in June 2016, and has issued loan and leasing guarantees to more than 100 enterprises for the total amount of over 8 million EUR.

Supporting innovation and data-driven economy are crosscutting, horizontal priorities of the European Investment Plan. Their focus areas like broadband, energy and transport networks are largely based on research and innovation.

Research, Innovation and Digitalization Performance of Latvia

R&D intensity in Latvia has stagnated since 2011, and both public and private investments remain very low. According to EUROSTAT data, R&D intensity doubled from 0,36% of GDP in 2003 to 0,7% in 2011, but has fluctuated between 0,6% and 0,7% ever since and remains well below the national 2020 target of 1,5% and EU-28 average of 2,03% of GDP. Structural Funds have almost exclusively filled in the void left by austerity measures targeting, among other funding, public research investment. Regrettably, despite supporting policies, business expenditures on R&D appear to be on a downward trend (from 0,33% of GDP in 2006, to 0,23% in 2010, to 0,15% in 2015), see Figure 2.

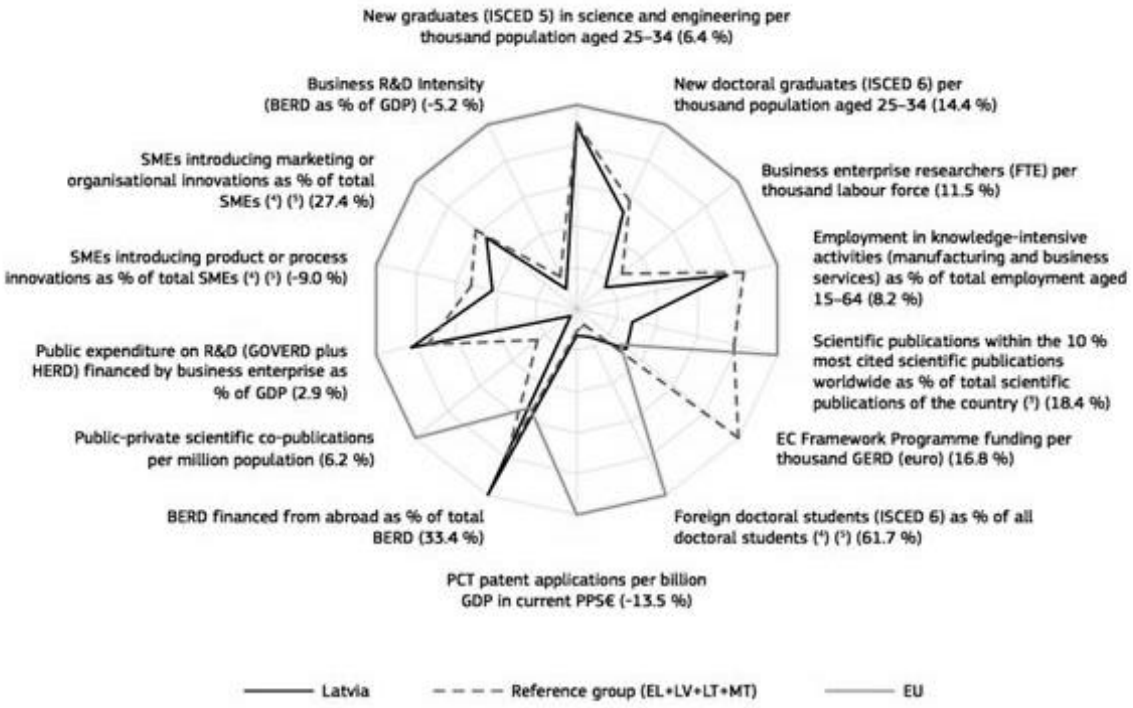


Source: European Commission, 2017c

Fig. 2. **Investment into R&D in Latvia and EU-28 (% of GDP)**

The structure of Latvian economy implies a low drive for innovations. The low share of medium and high-tech companies in value-added (the value added of high-tech services and manufacturing account only for ~7% of GDP ranking Latvia 24th in the EU), the prevalence of shadow economy and the large share of state-owned companies (~19% of GDP) leaves limited room for private innovative capacity. The lack of collaboration with research institutions and universities is reflected in the low number of public-private co-publications: 1.5 per million inhabitants, the lowest in the EU. The areas where Latvia fares below its reference group are: business enterprise researchers per thousand of labour force, scientific publications within the 10% most cited scientific publications worldwide, SMEs introducing product or process innovations and business R&D intensity (see Figure 3).

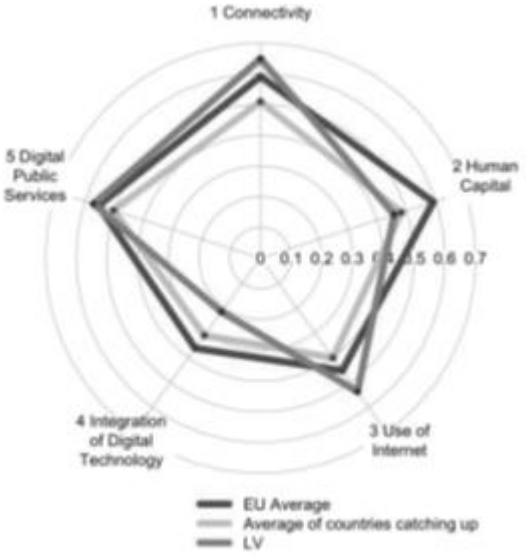
However, there are some fields where Latvia is specialized or where it has some potential for 'smart specialization'. The country shows comparative advantages in materials, in both science and technology, and has good potential in health, especially in the technological area. In addition, Latvia also displays good potential for specialization in environment, energy, ICT, biotechnology and transport technologies (Research and Innovation Performance in Latvia, 2015). Fortunately, this evidence of relative advantages correlates well with the areas established as priorities of Smart Specialization Framework, such as (1) knowledge-intensive bio-economics (use of forest and vegetable products in bio-materials and bio-products), (2) bio-medicine, bio-technology, bio-pharmaceuticals and medical technology; (3) smart materials, technologies and engineering systems; (4) smart energy; (5) ICT.



Source: European Commission, 2017g

Fig. 3. **Research and Innovation Performance in Latvia**

As regards digitalization, Latvia has relatively developed connectivity and infrastructure, but is increasingly facing shortage of skilled ICT professionals and integration of internet-based solutions in business operations, especially among SMEs, is below its EU peers (European Commission, 2017f). Latvia ranks 19 from EU-28 in Digital Economy and Society Index 2017. Overall progress is driven by increasing shares of fast broadband subscriptions as well as by the improved delivery of public services (see Fig. 4). More and more Latvians are going on-line and are using eGovernment services but still half of the population has low or no digital skills. Latvians are increasingly shopping online but businesses are exploiting technologies in a limited way.



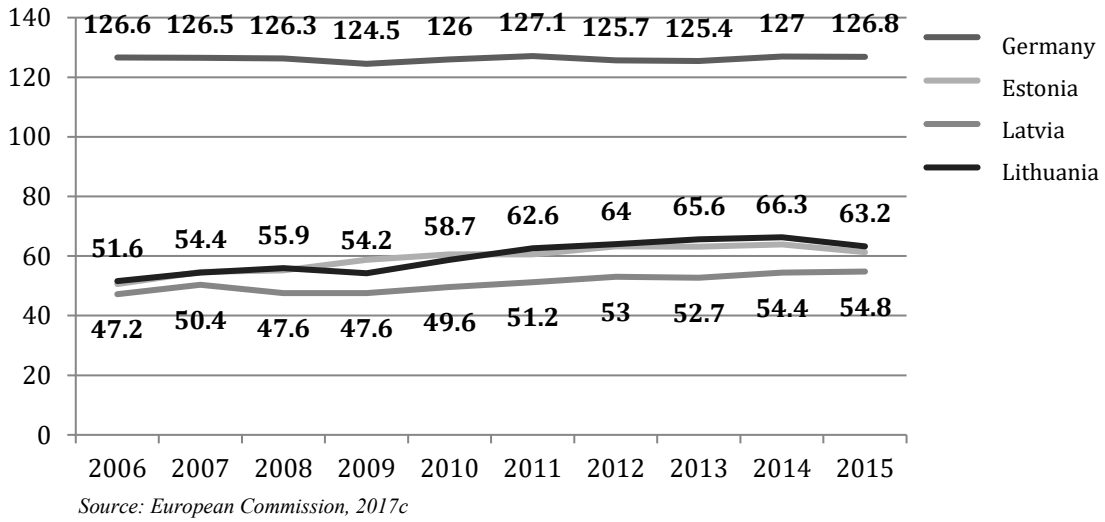
Source: European Commission, 2017f

Fig. 4. **Digital Economy and Society Index, 2016**

Economic Consequences of Low Innovation

Productivity

Low innovation performance weighs heavily on Latvia's productivity level. Latvia's labour productivity is among the lowest in the EU and further enhancing human capital is crucial for improving its growth potential. Productivity improvements are also important for maintaining competitiveness and sustaining income convergence with EU average (Country Report for Latvia, March 2016, staff working document, page 30). According to EUROSTAT data, in Latvia in 2015, labour productivity was 54,8% of the average EU-28, while in Lithuania productivity was 63,2% and in Germany – 126,8% of the average EU-28 (see Fig. 5)



Source: European Commission, 2017c

Fig. 5. **Labour productivity in Latvia in comparison (EU=100)**

Competitiveness

Likewise, weak innovation activity also brings down Latvia's overall global competitiveness. Even though Latvia on average ranks in the 49th place in World Economic Forum's Global Competitiveness Index, its innovation capacity remains the weakest pillar – ranked in the 64nd place worldwide. Latvia scores particularly poorly in terms of availability of scientists and engineers (99st place), government procurement of advanced technology products (98th place), company spending on R&D (71st place), and university-industry collaboration in R&D (77rd place). Latvia fares comparatively better in patent applications per million population (32th place) and quality of scientific research institutions (48th place).

Human capital

An important challenge remains the lack of highly qualified scientists and engineers due to aging of the previous cohort of researchers and low number of new doctorates and graduates in science and engineering, including in ICT. In 2015, according to Central Statistical Bureau, universities and research institutions employed 2 887 full-time scientists and 8 396 part-time research personnel (Central Statistical Bureau of Latvia, 2017). While university-level education attainment rate in Latvia is high, supplying graduates to knowledge-intensive sectors and attracting international students and professors remain a challenge. The proportion of university graduates in science, technology, engineering and mathematics (STEM) fields (12,5% in 2014) as compared to other fields is among the lowest in the EU (Country Report for Latvia, 2016). For instance, in Lithuania 18,2% of graduates are in STEM fields. Industries and investors suffer from insufficient human capital. The number of ICT specialists has increased at a slower pace in Latvia than in the EU, and

Latvia has a lower share of ICT specialists than the EU average. Industry association LIKTA and Ministry of Economics have predicted that Latvia will experience a shortfall of some 4,000 ICT specialists already by 2020, while 40% of ICT enterprises already complain of labour shortages (LR Ekonomikas ministrija, 2016). The lack of specialists in some areas are already driving up salaries, outpacing the increases in productivity. While the share of engineers in business enterprises remains low, there are positive exceptions. For instance, fibreglass factory Valmieras Stikla Šķiedra employs at least 5 PhD in its permanent staff and pharmaceutical company Grindex employs at least 70 scientists and spends 8-10% of its turnover on research and innovation (Grindex, 2017).

EU's Innovation Support Instruments

European Structural and Investment Funds (ESIF)

Out of the total ESIF envelope of 5,6 billion EUR for the 2014-2020 programming period, Latvia will allocate 8,4% or 474,6 million EUR for supporting research and innovation projects (European Commission, 2017e). This is the same proportion as in Lithuania, while Estonia will allocate a higher percentage for research – 14,9%. A range of policy tools have already been financed by Structural Funds in Latvia to increase innovation capacity, such as innovation vouchers, an entrepreneurial motivation programme, a cluster programme and programmes for conquering external markets and attracting venture capital to companies with high growth potential. The ongoing Technology Transfer programme consists of local support programmes in the main universities alongside centralized support for commercialization in international markets (European Commission, 2016b).

Baltic Innovation Fund (BIF)

The BIF is a "fund-of-funds" launched by the European Investment Fund in close co-operation with the governments of Lithuania, Latvia and Estonia in 2012 to boost equity investments into Baltic SMEs with high growth potential. BIF represents a EUR 52 million investment by EIF with each Baltic government committing EUR 26 million through their respective national agencies – INVEGA in Lithuania, KredEx in Estonia and Altum in Latvia. A significant part of the resources committed by national agencies is recycled resources from earlier Structural Funds-financed financial instruments under the JEREMIE framework. A total of 130 million EUR is being invested into private equity and venture capital funds focusing on the Baltic States during 2013-2016 to attract additional private finance and implement the best market standards for equity investing in businesses. This trans-national process provides a real opportunity to further develop the Baltic private equity and venture capital market and to stimulate employment and competitiveness in the region (European Investment Fund, 2017).

Horizon 2020

Horizon 2020 is the biggest EU research and innovation program ever with nearly 80 billion EUR of funding available over 7 years (2014 to 2020) – in addition to the private investment that this money attracts. By coupling research and innovation, Horizon 2020 is helping to achieve excellent science, industrial leadership and tackling societal challenges. The goal is to ensure Europe produces world-class science, removes barriers to innovation and makes it easier for the public and private sectors to work together in delivering innovation. Horizon 2020 funding can be a useful top-up of ESIF funding and create positive externalities of building networks between scientists, institutions and countries. However, it remains an excellence-oriented and competition-based source of finance.

COSME

Part of the COSME budget will fund guarantees and counter guarantees for financial intermediaries (e.g. guarantee organizations, banks, leasing companies) to help them provide more loan and lease finance to SMEs. This facility will also include the securitization of SME debt-finance portfolios. By sharing the risk, the COSME guarantees will allow financial intermediaries to expand the range of SMEs and types of financial transactions they can support. The impact is substantial - due to the leverage effect, every euro invested in a loan guarantee is expected to release up to 30 EUR of financing for SMEs. These guarantees will help many SMEs who might otherwise not be able to obtain funding due to their perceived higher risk or a lack of sufficient collateral. It is expected that up to 330 000 SMEs will receive loans backed by COSME guarantees, with the total value of lending reaching up to 21 billion EUR.[1] Latvian single development institution Altum is currently in negotiations with European Investment Fund with a view to start providing COSME project guarantees in 2017.

InnovFin - EU Finance for Innovators

InnovFin is a joint initiative launched by the EIB and EIF in cooperation with the European Commission under Horizon 2020. InnovFin consists of a series of integrated and complementary financing tools and advisory services offered by the EIB Group, covering the entire value chain of R&I in order to support investments from the smallest to the largest enterprise. InnovFin is available across all eligible sectors under Horizon 2020. By 2020, InnovFin is expected to make over EUR 24bn of debt and equity financing available to innovative companies to support EUR 48bn of final R&I investments. Potential intermediaries include investment funds, venture capital funds or vehicles that provide co-investment facilities for 'business angels' or co-operate with 'business angels'. The equity support will be channeled through intermediaries who target life sciences, ICT, or otherwise technological, non-technological, organizational or social innovation. Development institution Altum is using *InnovFin* instrument in Latvia since 2016.

Conclusion

For innovations to flourish, investment is, no doubt, a necessary pre-requisite, globally, in Europe and in Latvia. In this context, the national governments are responsible for a reasonable budgetary spending for research, but even more for creating conducive framework conditions – such as fostering private enterprise, creating a vibrant eco-system for start-ups, fighting shadow economy and improving the business environment. The EU stands ready to offer multiple support instruments, ranging from Investment Plan to Structural Funds, to Horizon 2020, and to InnovFin.

However, even when financing is available, it is up to the research community to make good use of them. The inherent quality and marketability of research projects remains essential.

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INFLUENCE ON TIME ON INTERNET: EVIDENCE OF ONLINE HOUSING ADVERTISEMENTS IN AUSTRIA

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Abstract: This study analyzes the impact of online ads for apartments in Austria on the Time on Internet (TOI), focusing primarily on the difference between the listed and transaction prices. The study confirms the influence on the TOI of several independent variables: e.g. the listed price, the transaction price, the condition of the apartment, the number of clicks, and the living space area. The observations have been provided by an Austrian internet platform and cover the period from 2010 to 2013. The methodology is based on descriptive and regression analyses. The empirical findings show that internet-related characteristics, such as the "number of inquiries," have an obvious influence on the TOI. This could be associated with an increasing interest in the particular ad: The higher the number of inquiries, the more interesting is the ad, which, in turn, affects the TOI. Furthermore, the living space, the condition, the availability of a balcony or terrace, as well as the location (city/non-city) have a strong influence on the TOI. We have noticed that the pricing of online ads significantly relies on the TOI. Our conclusion is: The higher the price difference between the offer and transaction price, and the better the quality of the building, the higher the interest for the apartment will be, finally resulting in a decreased TOI.

Key words: *Time on Internet, Housing Prices, Real Estate Online Marketing, Austria*

JEL code: R31, M37

Introduction

It is widely known that homebuyers, when searching for desired real property, increasingly rely on the Internet – as has been shown in numerous studies over the years (Littlefield J. E. et al., 2000; Seiler M. J. et al., 2012). The sellers are often supported by real estate brokers or agents in order to list their offers in line with the real estate market. Zumpano L. V. et al. (2003) investigated the main factors that influence the use of the Internet as part of the homebuying process. One of the findings shows that the use of the internet as a search tool does not reduce the buyer's search time, but rather reduces the search costs, thus encouraging buyers to search more intensively. Several studies have investigated the Time on Market (TOM) in relation to the listed price and pointed out toward diverse interaction effects that depend on housing markets (Cubbin J, 1974; Trippi R. R., 1977; Miller N. G., 1978; Ford J. S. et al., 2005; Li. W., 2004; McGreal S. et al., 2009). Jud D. G. et al. (1996) analyzed the impact of marketing strategies on the TOM and found that pricing related marketing strategies have a strongly influence. In the analysis of TOM and price interaction, McGreal S. et al. (2009) detected different price behavior in the UK market compared to the US market. Anglin P. M. et al. (2003) analyzed the list prices in relation to the TOM and found that higher prices of the real property lead to an increased TOM. This effect is getting larger for the type of houses with a low price variance. Allen M. T. et al. (2005) found no evidence of the price range strategy on transaction prices, but housings with range prices takes longer to sell. The changes in the distribution of the TOM and the market changes have been analyzed by Carrillo P. E. and Pope J. C. (2012). Hui E. et al. (2012)

analyzed the TOM related to pricing strategies and found that, although factors such as above-market prices, selling prices, an apartment's tenure status, general property price trends, and changes in the unemployment rate have a significant impact on the TOM in sub-period analyses, their respective impact changes over time. Most studies related to this topic analyze the relationship of the TOM and the selling/purchasing price. Sirmans S. G. et al. (2010) used meta-regression to examine the relationship between the selling price and the TOM for residential properties. The results showed that the TOM coefficient is sensitive to the time of selling, the income, the size of the hedonic model, and the model specifications; however, it is not sensitive to the geographical location.

The research on this topic exhibits an evident complexity in the relationship between sales price and TOM, which is, however, primarily referable to the application of many different methods to date and the different behaviors of real estate markets (McGreal S. et al., 2009). In contrast to established TOM analyses, which analyze the duration of commercialization from the start of marketing the property to its successful sale, this paper focuses on the online marketing time, namely the Time on Internet (TOI). The end of the marketing time in this study does not refer to the sale, i.e., the transaction, but rather the deletion of the advertising from the internet platform. Most studies on this topic are related to the US and UK markets, and studies concerning Central Europe, particularly Austria, have not been compiled yet (Koch D. & Maier G., 2015). Furthermore, there have only been a few investigations about the influence on the TOI. The novelty of this study is that it focuses on the pricing difference of the listed prices and the transaction prices, with the Delta defining the overpricing or underpricing of the real property. Therefore, the purpose of this paper is to analyze the relation of the TOI to the pricing Delta, with the research question being formulated as follows: *What housing parameters and internet-related parameters of housing advertising affect the TOI?*

Hedonic pricing and hazard models of the TOM are well understood and accepted methodologies in the real estate literature (Benefield J. D. et al., 2011). Koch D. and Maier G. (2015) looked into a few of the most common investigative methods related to this topic: Ordinary Least Squares (OLS), Two Stages Least Squares (2SLS), and hazard models. On the one hand, Ordinary Least Squares (OLS) allows for testing and making corrections for self-selection and is flexible in dealing with endogeneity. On the other hand, non-normal error terms can lead to biased OLS coefficients. Hazard models are based on the application of the search theory and are often used in a Weibull distribution of property marketing time. Unfortunately, the aforementioned self-selection and endogeneity problems, which are common features in TOM studies, are not easily remedied with these models. Even in the related problem between property (sale) price and TOM, instrumental variables models, usually in the form of 2SLS, have been used. Critical points in this modeling are related to non-normality of the error term and the difficulty in calculating required inverse mills ratios to control self-selection issues between variables of interest and property marketing time (Waller B. D. et al., 2010).

The methodology chosen in this study is based on descriptive and regression analyses (OLS). The regression analysis primarily investigates the influence on the dependent variable TOI. The independent variables are the internet-related variables, such as the number of clicks, the number of inquiries, and the number of printed advertisements, as well as real property-related variables, such as location, the existence of a balcony or terrace, the living space area, and the condition. Furthermore, pricing variables are also included in the model: the listed price per m² and the price difference between listed and transaction prices. The pricing variables are also used for further regression models in order to check the impact of the variables.

The findings in this paper are relevant for real estate agents for the estimation of the TOI as well as for housing sellers for the estimation of the price levels based on the characteristics of the apartment. Furthermore, the impact on the TOI is helpful for marketing strategies. In addition to the relevance of online marketing, this research highlights the necessity of marketing in this kind of business.

Research results and discussion

1. Data

The data used within the scope of this study were provided by the real estate internet platform Immobilien.NET (URL: www.immobilien.net) and covered 791 observations for the period from December 2009 to December 2012. The sample does not include any recent data because the company of the internet platform was sold in 2014 and newer data were not available. The following chapter describes the data used in more detail.

2. Definition of variables

The dependent variable in one of our regression models is the Time on Internet (TOI). The TOI is measured in days, as the difference between the date when the ad is placed on the internet platform and the date when the ad is deleted. It should be noted that the TOI differs from the TOM, which is characterized as the general marketing period. The TOM is, therefore, the time between the date when the offer is listed and the date when the offer is accepted. This paper focuses on the TOI, regardless of whether the offering is successful or not. From the data, it cannot be determined whether the particular offering, which is based on internet marketing, was successful. Should the real property be sold accordingly or withdrawn from the market, it must immediately be taken off the platform. This deletion is compulsory according to the platform's terms of use and as part of the obligation of the seller or buyer, as this enables users to quickly check whether the object is still available. In addition to the TOI, this investigation uses internet-related variables, like the number of clicks (number of views), in addition to housing-related variables, like the living space area, the condition of the apartment, etc. To answer the research question, we assume that the variable Delta price should be highly interesting. The Delta price represents the difference between the listed price and the transaction price of the apartment advertised.

$$Delta\ price\ [in\ \%] = \frac{Transaction\ price}{Listed\ price} - 1 \qquad (1)$$

The transaction price is obtained from the public land register and, therefore, defines the market value of the apartment. The variable Delta price defines the overpricing or underpricing of the apartment. It should be considered that the price from the land register does not always reflect the real price, because the transaction taxes are based on that particular price. Therefore, some people earn a part of the price on the side. Table 1 shows the variables and their characteristics:

Table 1

Definition of the variables

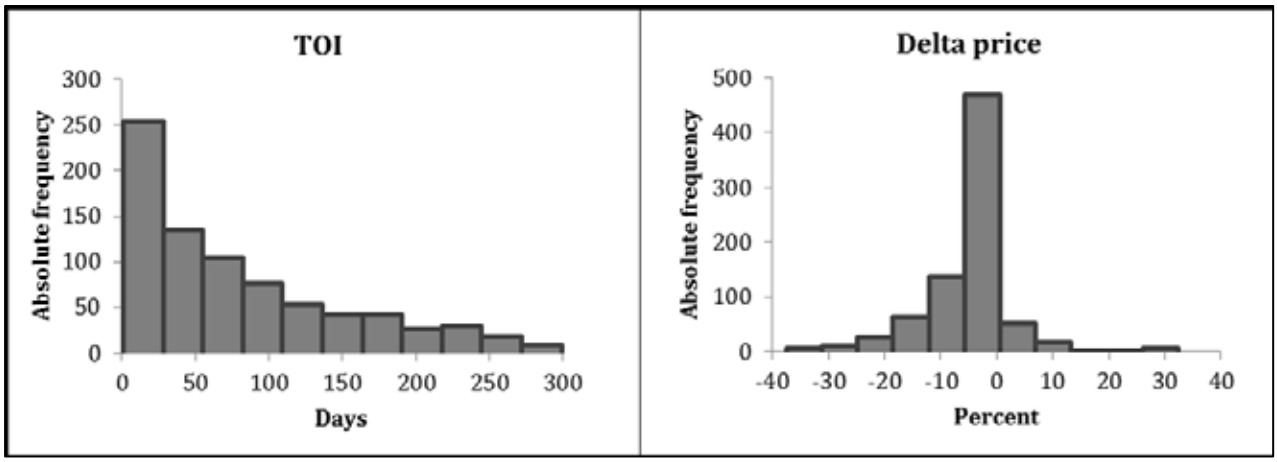
Variable	Name	Definition
TOI	Time on Internet	Time of the ad on the internet platform in days
nc	Number of clicks	Number of clicks to see the details of the ad
np	Number of printings	Number of clicks to print the ad
no	Number of offerings	Number of clicks to request an offer
loc	Location	The location is classified as city (1) and land (2)
pr	Listed price m2	Listed price per m² of living space
dp	Delta price	Difference of the listed and transaction price
sp	Living space	Area of the flat in square metres
bt	Balcony terrace	Existence of a terrace or a balcony (Yes=1 / No=0)
co	Condition	Condition of the flat /building. Classified into first usage (1), very good (2), good (3) and in need of renovation (4)

Source: author's construction based on data provided by Immobilien.NET.

The classification of the variable location into city and non-city consider the provincial capitals (e.g., Innsbruck, Salzburg, and Graz) and the federal capital (Vienna) for the category city. Other smaller cities, especially municipalities and rural areas, are classified as non-city. The condition describes the quality of the apartment regarding its equipment. The condition is classified into first usage, which includes developed and new buildings, very good, good, and the poorest condition describing property in need of repair.

3. Descriptive statistics

The variable TOI has an average value of about 80 days. The distribution is illustrated in Figure 1 and is positively skewed. The median is 57 days and the 25 percent quantile assumes 22 days. The chart on the right side shows the distribution of the Delta price. The Delta price is on average -4.12 % and has a standard deviation of 7.81.



Source: author`s calculation based on data provided by Immobilien.NET (n=791 observations).

Fig. 1: **Distribution of the TOI and Delta price**

Table 2 summarizes the mean, minimum, maximum, and standard deviations of the ratio-scaled variables and the proportion of the binary-scaled variables. The variables TOI and Delta price are of primary interest and the descriptive statistics show a broad bandwidth. The TOI has a minimum of 1 day and a maximum of 299 days – the Delta price has a minimum of -37.50% and a maximum of +32.38%.

From the overall 791 observations, 42% were conducted in cities and 48% have a balcony or a terrace. As far as the conditions are concerned, 16% are new apartments that are in the project stage, with the majority (77%) being in a very good or good state and about 7% in a poorer condition and in need of renovation.

Table 2

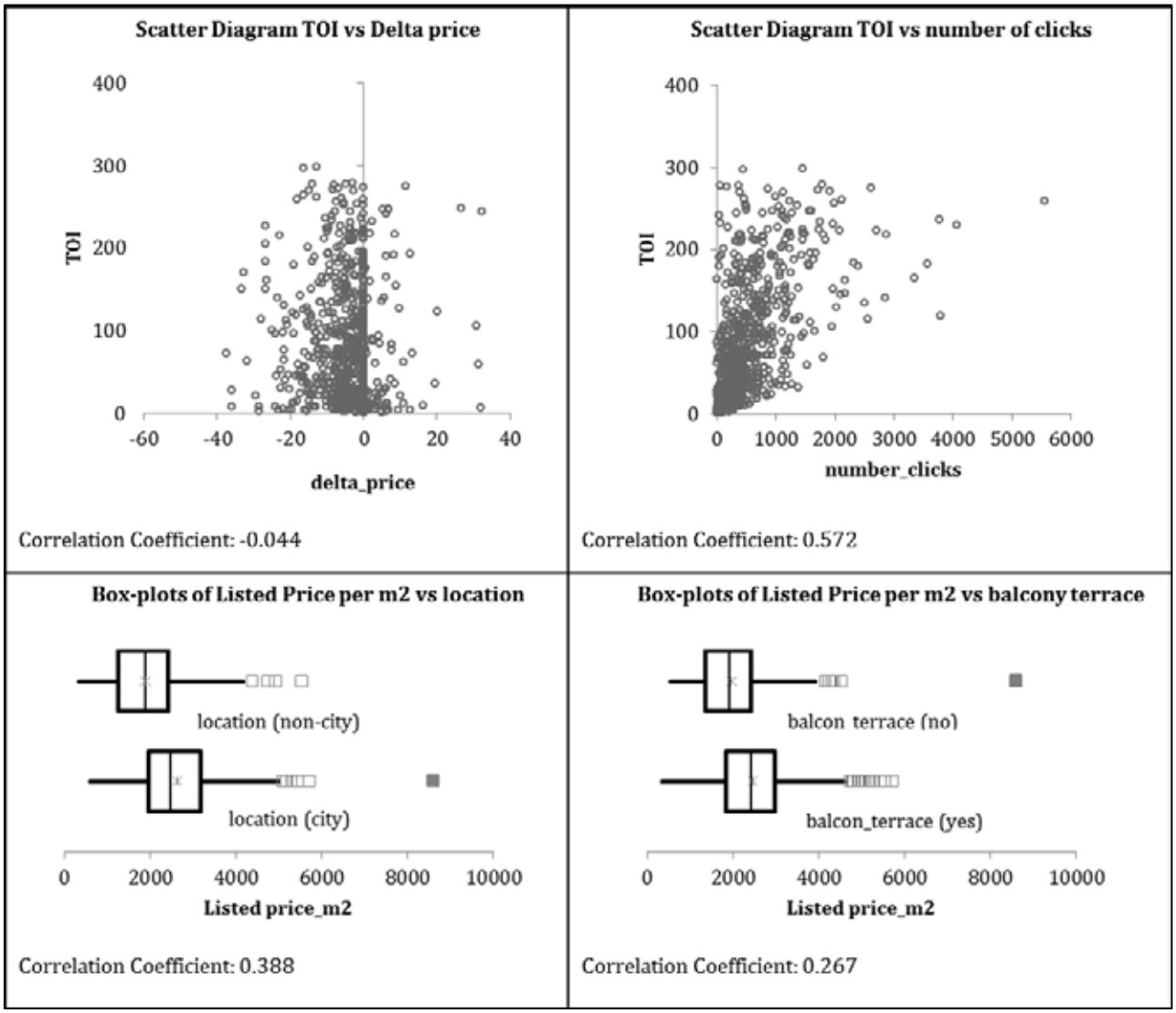
Descriptive statistics of the variables

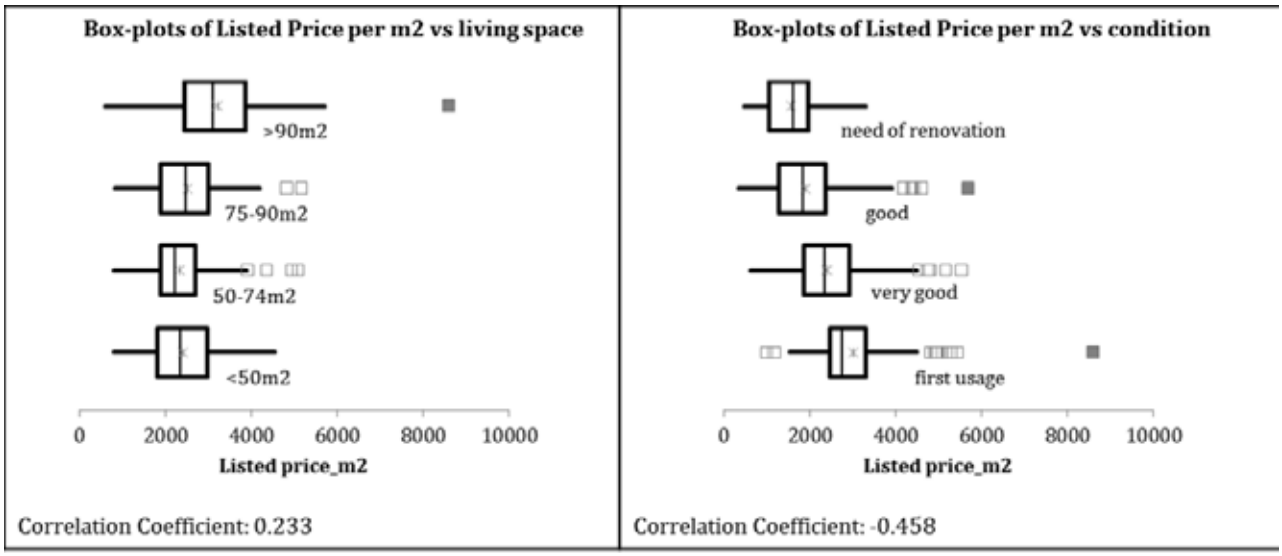
Variable (ratio)	Mean	Min	Max	Std.-dev.
Time on Internet (TOI)	79.90	1	299	72.11
LogTOI	3.84	0	5.70	1.21
Number of clicks	513.08	0	5,547	569.50
Number of printings	2.36	0	52	4.60
Number of offerings	2.00	0	22	2.95
Listed price per m2	2,211.23	345.24	8,604.65	942.67
Delta price	-4.12	-37.50	32.38	7.81
Living space	76.43	19.00	213.00	26.80

Variable (categorical)	Proportion	Variable (categorical)	Proportion
Location (city)	0.42	Condition (first usage)	0.16
Location (non - city)	0.58	Condition (very good)	0.30
Balcony terrace (yes)	0.48	Condition (good)	0.47
Balcony terrace (no)	0.52	Condition (in need of renovation)	0.07

Source: author's calculations based on data provided by Immobilien.NET (n=791 observations).

We first applied correlation analysis to examine any interaction between the TOI, the Delta price, and internet-related variables. We also investigated the correlation between listed price vs. condition, location, living space, and the existence of either balcony or terrace. Figure 2 illustrates the scatter diagrams of the TOI in interaction with the Delta price and the number of clicks, as well as selected box plots of the listed price per m² in interaction with different housing characteristics.





Source: author's calculations based on data provided by Immobilien.NET (n=791 observations).

Fig. 2: **Selected scatter diagrams of TOI and box-plots of Listed Price per m2**

The scatter diagrams and the correlation coefficients show that there is only a small interaction between the TOI and Delta price. The interaction between the TOI and the number of clicks per day is much higher. The selected box plots refer to the relation of different specifications to the price listed. It could be concluded that the location (if the property is in a city or a rural area) and the existence of a balcony or a terrace have a positive effect on the listed price per m². The living space area is classified into four typical classes and their interaction with the price shows that smaller apartments (up to 50m²) and larger apartments (more than 90m²) have a higher price than mid-sized apartments. Most often, the high-priced apartments with more space are in a better condition and are located on higher floors in the building. As expected, the condition of the apartment has a high impact on the price.

4. Empirical findings

The empirical findings are based on the Ordinary Least Squares (OLS) regression model. The dependent variable in the first model A is lnTOI (log-transformed) and the independent variables (no, nc, np, lo, sp, bt, co, pr and dp) are defined in Table 1. The log transformation takes place due to the distribution of the TOI. The regression model is defined with the following formula (2).

Model A $$LogTOI \coloneqq no_i + nc_i + np_i + lo_i + sp_i + bt_i + co_i + pr_i + dp_i + e \quad (2)$$

In order to monitor our regression model, additional models B and C have been applied – in model B with the listed price per m² (Pr) as the dependent variable, and in model C with the Delta price (Dp) as the dependent variable.

Model B $$Pr \coloneqq no_i + nc_i + np_i + lo_i + sp_i + bt_i + co_i + logTOI_i + \mathrm{e} \quad (3)$$

Model C $$Dp \coloneqq no_i + nc_i + np_i + lo_i + sp_i + bt_i + co_i + pr_i + logTOI_i + e \quad (4)$$

The results of all regression models are depicted in Table 3. The first column lists the independent variables, the other columns list the different regression models, and the dependent variable is depicted in the first line. For each independent variable, the coefficient and the p-value results are shown in Table 3. The explanatory power (adjusted $R^2 = 0.397$) for model A (TOI) is quite low, but in line with previous studies. Previous TOM literature is characterized through a low R^2 e.g. Zumpano L. V. et al. (2003): 0.076—OLS, Waller B. D. et al. (2010): 0.266 / 0.2560—OLS and 2SLS, Allen M. T.

et al. (2005): 0.195 / 0.194—OLS and 2SLS, Anglin P. M. et al. (2003): 0.13—OLS, Jud D. G. et al. (1996): 0.12—OLS, Carrillo P. E. (2008): 0.04 / 0.11 / 0.20 / 0.20 / 0.21—OLS.

Table 3

Results of OLS Regression on Model A, B, C

	Model A LogTOI	**Model B Listed price**	**Model C Delta price**
	Coefficient (p)	**Coefficient (p)**	**Coefficient (p)**
Intercept	3.092 *** (< 0.0001)	1,464.063*** (< 0.0001)	-0.70 (0.6270)
Internet related variables			
number_offering	-0.037** (0.0067)	-11.173 (0.263)	0.41*** (0.0001)
number_clicks	0.001*** (< 0.0001)	-0.114 (0.059)	0.00 (0.5312)
number_printings	0.009 (0.2512)	14.126 (0.021)	-0.03 (0.6485)
Housing related variables			
location	-0.490*** (< 0.0001)	908.245*** (< 0.0001)	-1.04 (0.1298)
living_space	0.003* (0.0116)	3.825*** (< 0.0001)	-0.01 (0.5285)
balcony_terrace	0.275*** (0.0003)	424.367*** (< 0.0001)	1,13 (0.0590)
condition_first usage	0.176 (0.1156)	500.421*** (< 0.0001)	5.79*** (< 0.0001)
condition_good	-0.147 (0.0701)	-373.009*** (< 0.0001)	-0.24 (0.7123)
condition_need of renovation	-0.658*** (< 0.0001)	-869.648*** (< 0.0001)	-1.25 (0.2889)
Price related variables			
listedprice_m2	0.000 (0.6166)		0.00 (0.1523)
delta_price	-0.013** (0.0045)		
Market related variable (TOI)			
LogTOI		17.267 (0.515)	-0.81** (0.0045)
Overall adjusted R^2	**0.397**	**0.450**	**0.090**
F	**48.305**	**65.641**	**8.111**

∗ significant at the 5% level; ∗∗ significant at the 1% level: ∗∗∗ significant at the 0.1% level

Source: author's calculation based on OLS Regression (n=791 observations)

Model A (LogTOI) shows that the main variable Delta price has a significant negative impact on the TOI. This effect could be explained by the under- or overpricing. For example, if the housing ad is underpriced by 10% – therefore, the listed price being lower than the transaction price – the TOI will be 13% lower (0.10 % x -0.013 = 13%). Conversely, in the case of a property that is overpriced, the listed price is higher than the transaction price and, therefore, has a larger TOI. To conclude, the pricing of apartments affects the TOI. Internet-related variables also influence the value of the TOI. The higher the number of inquiries, the more interesting is the ad, which results in a smaller TOI. The number of clicks has a positive impact, which means the higher the number of clicks, the larger the TOI. However, it should be noted that non-sellers' ads also might be included. The longer a property can be found on the internet, the higher the probability to receive additional clicks. With a good representation of the property, the TOI could be reduced, without influencing the price level. Furthermore, the results in the first model show that the variable location is highly significant – apartments in cities have a reduced TOI of about 5%. In addition, the existence of a balcony or a terrace has a positive significant impact on the TOI, which can be explained by the low pricing. The pricing effect could be seen in the regression model, where the variable balcony-terrace has a highly positive impact on the listed price. Regarding the condition, only apartments in poor condition (in need of renovation) reduce the TOI, which can also be explained by the low pricing. The purpose of model B only serves to control the variables. Only the property-related variables affect the listed price, which finally

verify the models. In model B, the internet variables have no impact. Model C investigates the Delta price. Here, the variable number of inquiries and the best level of condition are positively significant. The higher the number of inquiries, the higher the difference between the listed and transaction prices.

Conclusions, proposals, recommendations

In summary, our result shows that the Delta price evidently affects the TOI. In comparison to other studies, the TOI can be better explained by the internet-related variables. The regression analysis shows that the housing-related parameters, like location, balcony, and condition (poor level), are also significant. Compared to other TOM studies, the adjusted R^2 is higher, mostly because of the included internet-related variables. The number of inquiries reduces the TOI significantly and also the delta of the transaction and listed prices. It is clear that the marketing of real estate by means of online ads makes it possible to reach more potential buyers and finally serves to reduce online marketing time. It has to be mentioned that the quality of online advertising is not considered here. In this field, more research is necessary in order to further understand the efficiency of online marketing. Furthermore, in this study, only purchasing properties have been considered. Additional research in the rental market could bring new insights into the connection to this topic.

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THE MODIFICATION OF LIQUIDITY RATIO FOR THE COMPANY'S SOLVENCY ASSESSMENT

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Abstract. Based on scientific literature the liquidity ratio is known from the end of the 19th century when powerful infrastructural development began in America (Horrigan J.O., 1968). This article's perspective - indicators of liquidity are based on data of the financial reports of the companies from the 19th century. Eventually the annual statements of the companies were enhanced and new components appeared which in the 19th century were not shown in detail on debts and liabilities positions, such as: *Deferred Expenses/Prepaid Expenses/Expenditures of the Next Periods, Deferred Income/Prepaid Income/Income from the next periods, Accruals/Provisions.* The aim of this research is to study and analyze the calculation methods of liquidity ratios, using components of the data taken from the annual statements of the companies, and basing them on the empirical research to modify the calculations of liquidity ratios.

The authors of this paper are using international scientific literature and articles to understand the different schools of financial analysis. For the empirical research, to compare the traditional and modified calculation of liquidity ratios, the authors have used the the data from annual financial statements of Latvia's most profitable companies of different industries over a five-year period. In this research, the authors have applied quantitative and qualitative methods of economics such as the mathematical and the statistical methods, the ratio analysis and logically – constructive methods. At the end of the research the authors have summarized the general conclusions and findings.

Key words: *analysis, liquidity, methods, modification.*
JEL code: M41, M49

Introduction

Financial performance of a company can be calculated with the help of financial ratios. By using ratios companies can determine financial strength and weaknesses as well as opportunities in the market or an industry. One of the important ratios is liquidity - a measure of company's ability to pay off current debts as they come due.

So often we can hear that accounting is the language of financial analysis (Brammertz W..., 2009). Bases on scientific literature the liquidity ratio is known from the end of the 19th century when powerful infrastructural development began in America. (Horrigan J.O., 1968). This article's perspective - indicators of liquidity are based on data of the financial reports of the companies from the 19th century. Eventually the annual statements of the companies were enhanced and new components appeared, which in the 19th century were not shown in detail, on debts and liabilities positions, such as: *Deferred Expenses/Prepaid Expenses/Expenditures of the Next Periods, Deferred Income/Prepaid Income/Income from the next periods, Accruals/Provisions.*

The aim of this research is to study and analyze the calculation methods of liquidity ratios, using components of the data taken from the annual statements of the companies, and basing them on the empirical research to modify the calculations of liquidity ratios.

Research tasks are as follows: to analyze the liquidity interpretations of different schools of financial analysis, to choose the most popular liquidity ratio interpretation from fourteen different researches of financial analysis from American, French, Russian, English and German schools, to show that the same components of the balance sheet different

names due translation from another language and use of British or American English and GAAP or IFRS, to offer modification of three liquidity ratios: current, quick and cash based on the research literature, to compare the common and modify calculations of the liquidity ratios.

While researching scientific literature of the theoretical guidelines for the financial analysis of liquidity ratios some differences in ratio calculation can be found, but based on empirical research the authors have chosen the most popular ratio interpretations and offer to modify by removing *Deferred Income, Deferred Expenses* and adding *Accruals.*

The methodological bases for this study is scientific literature as well as annual reports of ten manufacturing Latvian companies whose shares are quoted at the Baltic exchange.

The annual statements that have been used for this study cover a five-years period – 2012 - 2016, theoretical approaches have been investigated since 1968. In the research, the authors have applied quantitative and qualitative research methods of economics such as the mathematical and the statistical methods, the ratio analysis, the graphical method, logically – constructive methods.

1. Theoretical Approaches of Calculation Liquidity Ratio

One of the instruments of determination of solvency of the organization is calculation of ratios of liquidity of the balance sheet. The most widespread ratios of liquidity are the Current ratio, Quick ratio and Cash ratio (Tuleneva N.A., 2013).

One way to test the degree of protection afforded to lenders focuses on the short-term credit extended to a business for funding its operations. It involves the liquid assets of business, that is, those current assets that can be readily converted into cash, on the assumption that they form a cushion against default (Helfert E., 2010).

Liquidity can be assessed using absolute and relative indicators. Since absolute indicators are not adapted for spatiotemporal comparisons, therefore, relative indicators-liquidity ratios are more actively used in the financial analysis (Kovalov V., 2011).

One determinant of a company's debt capacity is the liquidity of its assets. An asset is liquid if it can be readily converted to cash, while a liability is liquid if it must be repaid soon. As the subprime mortgage debacle illustrates, it is risky to finance illiquid assets such as fixed plant and equipment with liquid, short-term liabilities, because the liabilities will come due before the assets generate enough cash to pay them (Higgins R., 2016).

In the scientific literature, it is customary to distinguish three groups of current assets that differ from the position of their participation in the settlement of payments: the production reserves, receivables and cash. This simplest classification separates the group of current assets that differ in terms of specific features, as well as the degree of liquidity in the context of the transformation cycle. The given division of current assets into groups allows entering three main analytical ratios: Current, Quick and Cash.

The ratio most commonly used to appraise the debt exposure represented on the balance sheet is the current ratio. This relationship of current assets to current liabilities is an attempt to show the safety of current debt holders' claims in case of default (Helfert E., 2010).

The formula for calculating the *Current Ratio* all thirteen analyzed authors have recommended the same common type of the ratio calculation, apart from Sheremet A. and Negashev E. who have offered to use another way and all Current assets to account separately and do also an accent on not written off VAT in Table 1.

Table 1

The most common Current Ratio in the analyzed scientific literature

Nr.	Authors	Current Ratio
1	*CFA Institute USA, CIA Institute USA Dybal S., Giroux G., Kovalov V., Bernstein L., Bragg S., Brigham E., Helfert E., Higgins R., Palepu K., Richard Z., JefimovaO.*	***Current Assets/ Current Liabilities***
2	*Sheremet A. and Negashev E.*	(Cash+ Short-term Investments+ Stocks and not written off VAT)/ Current Liabilities

Source: author's construction based onCFA Institute USA, 2017, CIA Institute USA, 2016, Dybal S., 2009, Giroux G.,2003, Kovalov V., 2016, Bernstein L.,2000, Bragg S., 2014, Brigham E., 2016, Helfert E., 2010, Higgins R. 2016, Palepu K., 2007, Richard Z., 2000, Jefimova O.2002, Sheremet A. and Negashev E., 2013.

Because of the presence of inventory in the current ratio that was covered in the last section, the current ratio may not be the measure of a company's liquidity. One alternative is to use the quick ratio, which excludes inventory from the current assets portion of the current ratio. By doing so, one can gain a better understanding of a company's very short-term ability to generate cash from more liquid assets, such as accounts receivable and marketable securities (BraggS.,2007).

The *quick ratio* formula matches the most easily liquidated portions of current assets with current liabilities. The intent of this ratio is to see if a business has sufficient assets that are immediately convertible to cash to pay its bills. The key elements of current assets that are included in the quick ratio are cash, marketable securities, and accounts receivable. Inventory is not included in the quick ratio, since it can be quite difficult to sell off in the short term (Bragg S., 2014).

The *quick ratio*, also known as the *acid-test ratio*, came from the early miners who tested metal for gold by acid. If the metal passed the acid test it was pure gold. If metal failed the acid test by corroding from acid, it was a base metal and of no value (Higgins R., 2016).

From the Table 2, the most common interpretation of Quick Ratio is to use Marketable Securities, however cash Equivalents and Short-term Investments have temporary difference on investments. Cash equivalents, excluding items classified as marketable securities, include Short-Term, high liquidity Investments that are both readily convertible to known amounts of cash, and so near their maturity that they present minimal risk of changes in their value because of changes in interest rates.

The question of inclusion also needs to be considered separately in the structure of high liquidity means from of the article *Other Current Assets*, described by Dybal S. If the analysis of liquidity is made by someone, possessing information on structure and quality of financial investments (the accountant, internal auditor, financial auditor or manager), the problem is solved simply as if it is not present.

Table 2

The most common Quick Ratio in the analyzed scientific literature

Nr.	Authors	Quick Ratio
1	*CFA Institute USA, CIA InstituteUSA, BraggS., Giroux G., Palepu K., Jefimova O., Helfert E.*	***(Cash + Marketable Securities + Receivable) / Current Liabilities***
2	*Bernstein L., Richard Z.*	(Cash+Cash Equivalents+Accounts Receivable)/ Current Liabilities
3	*Brigham E., Higgins R.*	(Current Assets-Inventories)/ Current Liabilities
4	*Dybal S.*	(Cash+Short-term Investments+ Accounts Receivable+Other Current Assets)/Current Liabilities

Nr	Authors	Quick Ratio
5	*Kovalov V.*	(Accounts Receivable+Cash)/ Current Liabilities
6	*Sheremet A. and Negashev E.,*	(Cash+ Short-term Investments+ Accounts Receivable)/ Current Liabilities

Source: author's construction based on CFA Institute USA, 2017, CIA Institute USA, 2016, Dybal S., 2009, Giroux G.,2003, Kovalov V., 2016, Bernstein L.,2000, Bragg S., 2014, Brigham E., 2016, Helfert E., 2010, Higgins R. 2016, Palepu K., 2007, Richard Z., 2000, Jefimova O.2002, Sheremet A. and Negashev E., 2013.

If there are cases where the current ratio or quick ratio are not considered to be evidence of company's very short-term ability to pay off its liabilities, then the most conservative measure to use is the cash ratio. This ratio uses only cash and short-term marketable securities in the numerator, and so it is the best way to see what proportion of liabilities absolutely, positively can be paid right away (Bragg S., 2007).

Cash Ratio is the cruelest criterion of liquidity of the enterprise - shows what part short-term loan securities it can be extinguished immediately if necessary by the available money, can be called solvency coefficient (Kovalev V., 2011).

Table 3

The most common Cash Ration the analyzed scientific literature

Nr.	Authors	Cash Ratio
1	*CFA Institute USA, Giroux G., Palepu K., Jefimova O.*	***(Cash+ Marketable Securities) / Current Liabilities***
2	*Dybal S., Sheremet A. and Negashev E., Bragg S.,*	(Cash+ Short-term Investments) / Current Liabilities
3	*Bernstein L.*	(Cash+Cash Equivalent)/ Current Liabilities
4	*Kovalov V.*	Cash/ Current Liabilities
5	*CIA Institute USA, Brigham E., Helfert E., Higgins R., Richard Z.*	–

Source: author's construction based on CFA Institute USA, 2017, CIA Institute USA, 2016, Dybal S., 2009, Giroux G.,2003, Kovalov V., 2016, Bernstein L.,2000, Bragg S., 2014, Brigham E., 2016, Helfert E., 2010, Higgins R. 2016, Palepu K., 2007, Richard Z., 2000, Jefimova O.2002, Sheremet A. and Negashev E., 2013.

However, the authors recognize that ratios are rather crude measures of liquidity, for at least two reasons. First, rolling over some obligations, such as accounts payable, involves virtually no insolvency risk, provided the company is at least marginally profitable. Second, unless a company intends to go out of business, most of the cash generated by liquidating current assets cannot be used to reduce liabilities because it must be plowed back into the business to support continued operations.

Value of indicators can vary considerably on branches and kinds of activities. The joint analysis of indicators of liquidity of the enterprise are carried out according to Table 4 containing with the actual values of ratios for the beginning and the end of the reporting period their normal restrictions.

Table 4

Analysis of Liquidity Ratios

Ratio	Normal restrictions	For the beginning of the period	for the end of the period	Changes in a year
1	2	3	4	5
Cash	≥2	0.35	0.43	+0.08
Quick	≥1	0.58	0.61	+0.03
Current	≥2	3.38	2.02	-0.36

Source: author's calculations based on *Sheremet A. and Negashev E., 2013.*

Based on some scientific literature ratios of liquidity have been used at the end of the 19th century - at the beginning of the 20th century, based on the company's financial statement data of that time, and till today have not been modified.

Eventually the annual statement of the company was enhanced and new components appeared which in the 19th century were not shown in detail on debtors and liabilities positions, such as: 1*) Deferred Expenses/Prepaid Expenses;* 2) *Differed Income/Prepaid Income/Deferred Revenue/Next Period Revenue;* 3) *Accruals/Provisions.*

Having analyzed scientific literature and annual reports of 10 large Latvian manufacturing companies, it is possible to make the conclusion that the same components of balance are transcribed in different ways as in scientific literature and in balance sheets for the enterprises. The authors have selected the most popular ones from the scientific literature in Table 5.

Deferred Expenses – the payments are made before the balance sheet date but relating to future financial years, indicating the balance sheet item. *Deferred Income* – the payments are received before the balance sheet date but relating to a subsequent financial year or further reporting years (Annual accounts and Consolidated…, 2016).

Deferred Income – the payments are received before the balance sheet data but relating to a subsequent financial year or further reporting years.

PrePayment – advances from customers is a payment in accordance with the contract the buyer pays the seller to the goods or services receipt. This advance payment is usually part of the product or service to the full amount

An amount from profits that has been put aside in a company's accounts to cover an expected or potential future liability is called a provision.

Accruals - Provisions are intended to cover liabilities the nature of which is clearly defined and that the balance sheet date are expected or known or that will certainly arise, but you can change those commitments required to cover the size or the date of occurrence (Annual accounts and Consolidated…, 2016).

Authors of the paper have based their research on assessing *Deferred Income, Deferred Expenses, Advance Payment* and *50% from Accruals* offered to modify liquidity ratios.

Table 5

The common Liquidity Ratio Modification based on the balance sheet data

Ratios	Basic Ratio	Modificatory Ratio
Current	Current Assets / Current Liabilities	Current Assets/ (Current Liabilities - ***Deferred Income - PrePayments)*** ***+ 50% from Accruals***
Quick	(Cash + Marketable Securities + Receivable) / Current Liabilities	(Cash + Marketable Securities+ (Receivable - ***Deferred Expenses)***/ (Current Liabilities - ***Deferred Income - PrePayment)*** ***+50% from Accruals***
Cash	(Cash+ Marketable Securities)/ Current Liabilities	(Cash+ Marketable Securities) / (Current Liabilities - ***Deferred Income - PrePayment)*** ***+50% from Accruals***

Source: table made by the authors of this paper

Modified current, quick and cash ratios in denominator does not include *Deferred Income* in *Current Liabilities*, because *Deferred Income* does not contain liability character. *Deferred Income* is recognized as an obligation on the balance sheet of a company that receives advance payments, because it owes its customers services or products.

To *Current Liabilities* add 50%from *Accruals,* because it is also reserves of future expenses that are not of a mandatory nature, but from balance sheet external users can't identify – long-term provisions or current ones.

Modified ratio of the liquidity ratios does not include the *Prepayments* received from buyers in a denominator (they are taken from the current liabilities). According to the authors such option for the calculation of ratios estimates more the general liquidity of the company precisely, as the advance payments received from the buyers do not assume urgent repayment and often are given already under production of the enterprise made and intended for sale.

Deferred Expenses authors subtract from *Receivable* in Quick Ratio, because of *Deferred Expenses* in Receivable are products or services.

In the next chapter, the authors will analyze if significant differences exist between the common and modify liquidity ratio calculations.

2. Data Collection for Empirical Research of The Latvian Companies Quoted at The Exchange

For empirical study, financial statements of 10 Latvian manufacturing companies were used. Assets liquidity ratios were calculated from the balance sheets of each company for the period of 2012-2016.

To achieve the aim of this research, the authors compared common liquidity ratios with modified one's based on the balance sheets of 10 Latvian companies listed in the Baltic exchange. The authors looked at manufacturing companies based on NACE (Nomenclature of Economic Activities) code.

When comparing the common *Current Ratio* with *Modify* calculation authors conclude that ratio modification change results for the manufactory companies. In the Table 6 authors calculated every indicator separate to show the changes of the results.

To modify the current ratio with *Deferred Income* it shows that the results differ, but not in every enterprise and not every year, it high ratio, bet, because sum of Deferred Income not so significant compare with current assets. From the results of AS Grindex company in 2013-year – Deferred Income change results in 11.08%.

Accruals in Latvia companies are used very seldom, but how it can be seen from Table 6, is it can change results on average for 10%.

The indicator *PrePayments from Customers* is very useful in modification of liquidity ratio, because these components of the balance sheet from analyze companies use often, and author advice to pay attention to this component, which has been discussed in the scientific literature by Jefimova O.

Table 6

Current Ratio Modification

Production enterprise	AS Grindex	AS Olainfarm	AS SAF Tehnika	AS Valmieras Stikla Šķiedra	AS Rīgas Autoelektroaparātu Rūpnīca	AS Rīgas Juvelierizstrādāju mu Rūpnīca	AS HansaMatrix	AS Latvijas Balzams	AS Latvijas Gāze	AS Kurzemes Atslēga 21	**Current Ratio Modification**
Nr.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
2012	**3.35**	**3.49**	**5.84**	**1.30**	**1.03**	**39.11**	-	**1.79**	**1.94**	**6.27**	C.Assets/C.Liabilities
	3.43	X	X	1.35	X	X	-	1.79	1.96	X	Cut out Deferred Income
	X	X	X	X	1,00	35.54	-	X	X	5.79	Add 50% from Accruals
	3.38	3.52	6.63	8.53	1.04	X	-	1.79	X	6.81	PrePayments from Customers
	3.46	*3.52*	*6.63*	*1.40*	*1.00*	*35.54*	-	*1.79*	*1.96*	*6.25*	**Modification in the Sum**
2013	**4.11**	**2.37**	**8.71**	**1.37**	**1.43**	**40.00**	-	**1.62**	**1.78**	**5.16**	C.Assets/C.Liabilities
	3.70	2.45	X	1.38	X	X	-	1.62	1.79	X	Cut out Deferred Income
	X	X	X	X	1.39	36.28	-	X	X	4.81	Add 50% from Accruals
	4.19	2.38	9.30	0.52	1.43	X	-	1.62	X	6.50	PrePayments from Customers
	4.27	*2.46*	*9.30*	*1.39*	*1.39*	*36,28*	-	*1.62*	*1.79*	*5.95*	**Modification in the Sum**

Nr.	1	2	3	4	5	6	7	8	9	10	11
2014	**2.19**	**2.81**	**4.41**	**1.47**	**1.16**	**34.97**	-	**1.89**	**3.66**	**6.22**	C.Assets/C.Liabilities
	2.26	3.04	X	1.48	X	X	-	X	3.75	X	Cut out Deferred Income
	X	X	X	X	1.13	32.16	-	X	X	5.84	Add 50% from Accruals
	2.21	2.81	4.91	0.46	1.16	X	-	X	X	6.92	PrePayments from Customers
	2.30	*3.05*	*4.91*	*1.49*	*1.13*	*32.16*	-	*1.89*	*3.75*	*6.45*	**Modification in the Sum**
2015	**2.12**	**3.17**	**6.92**	**1.26**	**1.06**	**11.00**	**1.21**	**2.25**	**3.59**	**6.98**	C.Assets/C.Liabilities
	2.17	3.32	7.25	1.28	X	X	1.25	X	3.67	X	Cut out Deferred Income
	X	X	X	X	1,05	10,62	X	X	X	6,57	Add 50% from Accruals
	2.23	3.22	8.02	0.39	1.06	X	1.45	X	X	7.36	PrePayments from Customers
	2.29	*3.37*	*8.47*	*1.42*	*1.05*	*10.62*	*1.52*	*2.25*	*3.67*	*6.91*	**Modification in the Sum**
2016	**2.64**	**2.60**	**5.54**	**1.12**	**1.07**	**15.63**	**1.00**	**2.75**	**3.76**	**5.06**	C.Assets/C.Liabilities
	2.68	2.66	5.70	1.13	X	X	1.45	X	3.79	X	Cut out Deferred Income
	X	X	X	X	1.07	X	X	X	X	X	Add 50% from Accruals
	2.66	2.61	6.05	0.38	1.07	X	1.12	X	X	5.25	PrePayments from Customers
	2.69	*2.66*	*6.24*	*1.13*	*1.07*	*15.63*	*1.39*	*2.75*	*3.79*	*5.25*	**Modification in the Sum**

Source: author's calculations based on Nasdaq Baltic data

Table 7

Quick Ratio Modification

Production enterprise	AS Grindex	AS Olainfarm	AS SAF Tehnika	AS Valmieras Stikla Šķiedra	AS Rīgas Autoelektroaparatu Rūpnīca	AS Rīgas Juvelierizstrādājumu Rūpnīca	AS HansaMatrix	AS Latvijas Balzams	AS Latvijas Gāze	AS Kurzemes Atslēga 21	Current Ratio Modification
Nr.	1	2	3	4	5	6	7	8	9	10	11
2012	**2.87**	**2.61**	**3.35**	**5.52**	**0.31**	**18.43**	-	**1.26**	**0.90**	**1.42**	(Cash+Marketable Securities+Receivable)/ CurrentLiabilities
	2.86	2.59	X	5.39	0.29	18.41	-	1.26	X	1.42	Cut out Deferred Expenses
	2.94	X	X	8.27	X	X	-	1.26	0.91	X	Cut out Deferred Income
	X	X	X	X	0.29	17.21	-	X	X	1.31	Add 50% from Accruals
	2.90	2.63	3.81	8.53	0.31	X	-	1.26	X	1.60	PrePayments from Customers
	2.95	*2.61*	*3.81*	*17.15*	*0.29*	*17.20*	-	*1.26*	*0.90*	*1.46*	**Modification in the Sum**
2013	**3.54**	**1.62**	**4.52**	**0.52**	**0.51**	**20.44**	-	**0.11**	**0.44**	**1.13**	(Cash+Marketable Securities+Receivable)/ CurrentLiabilities
	3.35	1.61	X	0.51	0.50	20.34	-	0.10	X	1.13	Cut out Deferred Expenses

Nr.	1	2	3	4	5	6	7	8	9	10	11
	3.61	1.67	X	0.52	X	X	-	0.11	0.45	X	Cut out Deferred Income
	X	X	X	X	0,49	18,55	-	X	X	1,05	Add 50% from Accruals
	3.61	1.62	4.82	0.52	0.51	X	-	0.11	X	1.43	PrePayments from Customers
	3.48	*1.67*	*4.82*	*0.52*	*0.48*	*18.46*	-	*0.10*	*0.45*	*1.30*	**Modification in the Sum**
	1.65	**1.83**	**2.53**	**0.46**	**0.38**	**15.02**	**-**	**1.28**	**2.05**	**1.04**	(Cash+Marketable Securities+Receivable)/ CurrentLiabilities
	1.50	1.82	X	0.44	0.38	14.93	-	X	X	1.04	Cut out Deferred Expenses
2014	1.70	1.98	4.13	0.46	X	X	-	X	2.10	X	Cut out Deferred Income
	X	X	X	X	0.37	13.81	-	X	X	0.98	Add 50% from Accruals
	1.67	1.84	2.82	0.46	0.38	X	-	X	X	1.16	Prepayments from Customers
	1.57	*1.97*	*4.95*	*0.45*	*0.37*	*13.73*	-	*1.28*	*2.10*	*1.08*	**Modification in the Sum**
	1.69	**2.04**	**4.32**	**0.39**	**0.32**	**5.65**	**0.76**	**1.47**	**2.02**	**1.86**	(Cash+Marketable Securities+Receivable)/ CurrentLiabilities
	1.49	1.93	X	0.36	0.32	5.64	0.76	X	X	1.85	Cut out Deferred Expenses
2015	1.72	2.14	4.52	0.39	X	X	0.79	X	2.07	X	Cut out Deferred Income
	X	X	X	X	0.32	5.45	X	X	X	1.75	Add 50% from Accruals
	1.79	2.07	5.00	0.39	0.32	X	0.92	X	X	1.96	PrePayments from Customers
	1.60	*2.05*	*5.29*	*0.36*	*0.32*	*5.44*	*0.95*	*1.47*	*2.07*	*1.83*	**Modification in the Sum**
	2.10	**1.62**	**3.15**	**0.37**	**0.26**	**8.35**	**0.67**	**1.93**	**1.34**	**0.86**	(Cash+Marketable Securities+Receivable)/ CurrentLiabilities
	1.74	1.58	X	0.35	0.26	8.34	0.65	X	X	X	Cut out Deferred Expenses
2016	2.13	1.65	3.24	0.38	X	X	0.69	X	1.35	X	Cut out Deferred Income
	X	X	X	X	0.26	X	X	X	X	X	Add 50% from Accruals
	2.11	1.62	3.44	0.38	0.27	X	0.75	X	X	0.90	PrePayments from Customers
	1.77	*1.61*	*3.54*	*0.36*	*0.26*	*8.34*	*0.75*	*1.93*	*1.35*	*0.90*	**Modification in the Sum**

Source: author's calculations based on Nasdaq Baltic data

In *Quick Ratio* modification, the authors offer to subtract from Receivable the Deferred Expenses in denominator of the Ratio.

Deferred Expenses in modification do not always show considerable changes, but in some situations, it can be important for financial analyses, as it can be seen in AS Grindex example from in 2016, when ratio by Deferred Expenses modification has changed for 21%.

Results of calculations of *Quick Ratio* modification when subtracting *Deferred Income* show differences too. From Table 7 in AS SAF Tehnika the difference is 5% in 2015 year and 2014 the difference is 39%. The authors conclude that

not always the difference is so considerable, but in some cases the quick ratio modification for financial analysis users can be important.

Accruals can change situation average in 6-10% from common quick ratio calculation. But from 10 analyzed companies only AS Rīgas Autoelektroaparātu Rūpnīca, AS Rīgas Juvelierizstrādājumu Rūpnīca and AS Kurzemes Atslēga 21use it.

Table 8

Cash Ratio Modification

Production enterprise	AS Grindex	AS Olainfarm	AS SAF Tehnika	AS Valmieras Stikla Šķiedra	AS Rīgas Autoelektroaparātu Rūpnīca	AS Rīgas Juvelierizstrādājumu	AS HansaMatrix	AS Latvijas Balzams	AS Latvijas Gāze	AS Kurzemes Atslēga 21	**Current Ratio Modification**
Nr.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
2012	**0.10**	**0.21**	**1.74**	**0.01**	**0.31**	**2.41**	**-**	**0.00**	**0.25**	**0.51**	(Cash+Marketable Securuties)/ CurrentLiabilities
	0.10	X	X	0.01	*X*	X	**-**	0.00	0.25	X	Cut out Deferred Income
	X	X	X	X	*0.29*	2.19	**-**	X	X	0.47	Add 50% from Accruals
	0.10	0.22	1.98	0.01	0.31	X	**-**	0.00	X	0.58	PrePayments from Customers
	0.10	*0.22*	*1.98*	*0.01*	*0.30*	*2.19*	*-*	*0.00*	0.25	*0.53*	**Modification in the Sum**
2013	**0.17**	**0.10**	**2.56**	**0.04**	**0.51**	**4.24**	**-**	**0.00**	**0.20**	**0.48**	(Cash+Marketable Securuties)/ CurrentLiabilities
	0.18	0.10	X	0.04	X	X	**-**	0.00	0.20	X	Cut out Deferred Income
	X	X	X	X	0.49	3.85	**-**	X	X	0.44	Add 50% from Accruals
	0.18	0.10	2.73	0.04	0.51	X	**-**	0.00	X	0,60	PrePayments from Customers
	0.18	*0.10*	2.73	*0.04*	*0.49*	*3.85*	*-*	*0.00*	*0.20*	*0.55*	**Modification in the Sum**
2014	**0.06**	**0.11**	**1.83**	**0.02**	**0.38**	**2.03**	**-**	**0.01**	**1.02**	**0.08**	(Cash+Marketable Securuties)/ CurrentLiabilities
	0.06	0.12	2.98	0.02	X	X	**-**	X	1.04	X	Cut out Deferred Income
	X	X	X	X	0.37	1.87	**-**	X	X	0.08	Add 50% from Accruals
	0.06	0.11	2.04	0.02	0.38	X	**-**	X	X	0.09	PrePayments from Customers
	0.06	*0.12*	*3.58*	*0.02*	*0.37*	*1.87*	*-*	*0.01*	*1.04*	*0.08*	**Modification in the Sum**
2015	**0.02**	**0.30**	**3.43**	**0.03**	**0.32**	**0.97**	**0,05**	**0.00**	**1.49**	**0.50**	(Cash+Marketable Securuties)/ CurrentLiabilities
	0.02	0.32	3.59	0.03	X	X	0,06	X	1.53	X	Cut out Deferred Income
	X	X	X	X	0.32	0.94	X	X	X	0.47	Add 50% from Accruals
	0.02	0.31	3.97	0.03	0.32	X	0,06	X	X	0.52	PrePayments from Customers
	0.02	*0.32*	*4.20*	*0.03*	*0.32*	*0.94*	*0,07*	*0.00*	*1.49*	*0.49*	**Modification in the Sum**
2016	**0.05**	**0.13**	**2.39**	**0.06**	**0.26**	**0.73**	**0,08**	**0.11**	**1.14**	**0.08**	(Cash+Marketable Securuties)/ CurrentLiabilities
	0.05	0.13	2.46	0.06	X	X	0,08	X	1.15	X	Cut out Deferred Income
	X	X	X	X	0.26	X	X	X	X	X	Add 50% from Accruals
	0.05	0.13	2.62	0.06	0.27	X	0,09	X	X	0.08	PrePayments from Customers
	0.05	*0.13*	*2.70*	*0.06*	*0.27*	*0.73*	*0,09*	*0.11*	*1.15*	*0.08*	**Modification in the Sum**

Source: author's calculations based on Nasdaq Baltic data

The same results are with Cash Ratio modification, but here considerable differences can be seen, compared to current and quick ratio example. The changes when subtracting *Deferred Income* is on average 5% higher, but it can play an important role when the financial analyses are being used.

The *Accruals* add 50% in *Cash Ratio* change results for 4-6%, in situations when company uses this position in balance sheet.

The *PrePayments from Customers* in cash modification are not so visible, but in some situation, it can change on average for 10%, for example in AS SAF Tehnika.

Analyzing the tendencies of the results of those calculations the authors conclude that in some cases there are significant differences and it is useful to contention research with other industries.

Conclusions

Estimating the results of the current research, authors have reached the following conclusions:

1. Studying scientific literature of the theoretical guidelines for the liquidity ratios the authors of this paper found differences in terminology and different approaches in current, quick and cash ratios calculations, different terminology formulations were used as well. Terminology used in the scientific literature differs based on GAAP or IFRS standard to British and American English and historical development of the language, so each scientists work should be careful analyzed.
2. Analyzing common and modified liquidity ratios and their tendencies it is useful to use modification and in some situations, it shows great difference.
3. In liquidity ratios modification, it is very important to use *Deferred Income*, *Advance from Customers*, *Deferred Expenses,* because it shows significant differences in some cases.
4. It is important to continue the research and to make crash test for *Provision*s to make sure that precautionary principle works and it correct to add only 50% from Accruals.
5. To conclude, the author wants to note, that the same study must continue within different industries and other important ratios of financial analysis.

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CAPITAL MARKETS UNION: THE CASE OF LATVIAN CORPORATE BOND MARKET

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Abstract. When facing critical economic and political challenges of the bank-based economy during the crisis years, the steps for a more market-based European economy were initiated by the European Commission in the way of increasing the role of the financial markets and fostering capital mobility. Capital Markets Union (CMU) is an attempt to redesign the structure of funding by the European corporates and gradually transform European economies towards market-based economies. Activation of a corporate bond market is one of the main targets of CMU.

Latvian corporate bond market showed moderate development till year 2012, when it took off and in 2017 reached 94% weight of the number of the Baltic bonds quoted. Scarce presence of the non-financial sector companies (4 out of 14 (Nasdaq Baltic, 2017)) represents their limitations for public debt listing from both supply and demand side thus making CMU introduction relevant and desirable for Latvian corporate bond market.

The aim of this article is while investigating the essence, progress and challenges of CMU introduction, explore the impact and relevance of CMU for Latvian corporate bond market. The article reveals that CMU focuses on securitization, infrastructure finance and providing financing alternatives to SMEs, where the main obstacles are present on the level of market fragmentation, standardisation of accounting and taxation practices. The study defines securitisation, cross-border trades and increased retail segment participation as CMU actions affecting Latvian corporate bond market to the most extent. The article concludes that Latvian corporate bond market while not being the first one to benefit from CMU introduction will gradually increase the number of non-financial sector issuers following the examples of bigger scope countries. The methods used in this article are scientific publication analysis, document analysis, data evaluation, and case study.

Key words: *Corporate bond market, Capital Markets Union, financing, Latvia.*
JEL code: G23, G24

Introduction

From the medieval time the role of banking sector remains unchanged in European financial markets. The bank as the place to get money as deposits and lend money by issuing loans keeps the monopoly in the capital markets of Europe where the market structure can be characterised by bank-borrower and bank-investor type of relationship. While banking is a traditional and credit-risk sound borrowing/lending mechanism, geographical limitations result in a potential skewness of money supply or demand thus preventing more effective attraction and allocation of capital. The latter could act as a barrier for quicker development of the European economy. The changes in the traditional bank-based pattern of the financing in Europe are taking place, where the study of Tocelovska (2017) indicates the shift of the paradigm of European economy towards market-based. The role of the financial markets as empowered by the recent financial crisis consequences, is being recognised by both academics and politicians.

Heavy reliance on the banking financing by the European countries remains one of the sharpest differences when compared corporate financing patterns of the European and USA economies. European Commission (2015a) stresses that while the European economy is as big as the American one, Europe's equity markets are less than half the size the American one, and its debt markets are less than a third. The gap between Member States is even bigger than that between

Europe and the US. Looking more specifically at the small and medium enterprise (SME) segment the Commission emphasises that the European SMEs receive five times less funding from capital markets, where Europe's SMEs, receive more than 75% of their external financing from bank loans. Narrowing SME segment to non-financial corporations only, the study of Valiante (2016) indicates that non-financial corporations' debt funding is 77% in bank loans, compared to less than 40% in the US. Analysing the statistics on the "per company basis", the study of Boldeanu and Tache (2016) points that in the EU and the United States there are 15000 companies that have access to capital markets by issuing either shares or bonds, while 25 million in the EU and about 5.7 million in the United States companies that finance their activities by other means. As the numerical estimates of the benefits of the CMU Deutsche Borse (2015) refers to EUR 1 trillion of capital, which companies could raise if half of the gap in capital markets fundraising between themselves and the US would be closed by 2020. Based on the current stage of development of European Union (EU) capital markets Association for Financial Markets in Europe (2014) estimates a realistic aim for the five-year horizon of the CMU initiative would be to increase the overall share of debt financing from the capital markets in Europe by 10 percentage points, from 25% of the total to at least 35%. The timing of the CMU introduction is proposed as reasonable where Rusek (2015) stresses that EU and Eurozone are entering a cyclical upturn phase caused by the mixture of recent EU policies and the depreciation of the Euro, (about 25 %).

Although the comparison of the European and US financing is commonly met in the official EC documents on the CMU, the strong academic view on the unwanted concept of copying US financing pattern is present. Berg et al (2015) argues that the traditional bank- based structure of the economy in Europe should be preserved. It is neither feasible nor desirable to force a change from the traditional bank-based European financial structure to a fully-fledged US-like structure. The change should come from a bigger and stronger corporate bond market. Association for Financial Markets in Europe (2014) stresses that we must acknowledge the essential structural differences in Europe when comparing to US markets: the diversity of currency, economic policies, tax rules, language and regulatory structures. Deutsche Borse (2015) supports the view on the need to grow non-banking funding and not to replicate the US model. Goldman Sachs (2015) considers French and German approach as a potential model for broader reform of the private placement market.

Despite having the free flow of capital as one of the fundament principles of EU, the progress in other focus areas is more evident and transparent. The capital markets remain divided by the boarders of the countries despite single currency and regulation alignment. While no single reason for such a division can be mentioned, the traditional reliance on banking financing could be the key factor, where the local presence of the bank and heavy credit risk analysis and control of the borrower keeps the costs of the loan relatively low and thus competitive in the short term. The longer-term factors such as sustainability of one source of financing, longer-term borrowing cost and diversification of the investor base is traditionally overlooked. The remaining presence of various currencies, fairly incomparable taxation systems of securities issuing and holding as well geographical fragmentation of credit risk is further lessening the risk appetite for geographically distant regions for investors. Moreover the system of fragmented depositories, which lack an easy link between each other, cheap link to one depository like Euroclear or Clearstream and transparent fee schedule- all negatively affects the motivation for both pan-European security issuance and pan-European investment.

According to the Deutsche Borse (2015), realising a Capital Markets Union across all 28 EU Member States would be a major achievement for European integration. While the number of the EU members soon will decrease to 27, Dixon (2014) stresses the importance of the City of London as of the largest capital market in Europe and the decreased potential of the CMU without Britain, the result of the United Kingdom voting is not changing CMU action plan. European Commission (2015a) stresses that CMU will complement Europe's strong tradition of bank financing by:

- unlocking more investment from the EU and the rest of the world;

- better connecting financing to investment projects across the EU;
- making the financial system more stable;
- deepening financial integration and increase competition.

CMU targets financial markets as an important source of financing. While the scope of CMU is covering public and private equity, venture capital, loans made by entities that are not banks, hedge funds, peer-to-peer lending, corporate bonds play one of the key role in the CMU action plan. Both public and private type, traditional corporate bonds and loans packaged and issued as bonds via securitisation are within the scope of CMU.

The aim of this article is while investigating the essence, progress and challenges of CMU introduction, explore the impact of CMU on Latvian corporate bond market development, its relevance and outcome scenarios. The article employs scientific publication analysis, document analysis, data evaluation, and case study research methods.

This paper contributes in two fundamental ways to the current research on the corporate bond market development in Latvia and CMU introduction. Firstly, the author provides in-depth analysis of the academic development of CMU framework and its introduction concept. Secondly, the author analyses the CMU application to Latvia and its potential effect on the areas discovered as comparatively lagging in their development by the study of Tocelovska (2017)

The structure of this paper commences with the review and analysis of the political and academic studies of the CMU initiative in Europe and its potential influence on the corporate bond market. The potential challenges of CMU introduction are identified and analysed. While analysed for its corporate segment development, the bond market of Latvia is studied for the potential CMU effect. Finally, the results of corporate bonds market development in Latvia are presented within the CMU introduction perspective, the expected outcomes are described as well as future areas of research are proposed.

Research Results and Discussion

In 2015 European Commission created the Capital Markets Union initiative and plan as the next step for a more integrated Europe on the financial markets level. In the result, the CMU will reinforce the third pillar of the Investment Plan for Europe, which will be beneficial for all Member States of the European Union. CMU action plan focuses on six main areas: 1) financing for innovation, start-ups and non-listed companies; 2) making it easier for companies to enter and raise capital on public markets; 3) investing for the long term, infrastructure and sustainable investment; 4) fostering retail and institutional investment; 5) leveraging baking capacity to support the wider economy; and 6) facilitating cross-border investing (European Commission, 2015a).

The academic research detects three main focus areas of the CMU: capital markets activation for SMEs (including market harmonisation), investor base diversification and cross border investment. The study of Dixon (2014) while stressing the difference between banking union as Eurozone project and CMU as European Union project, echoes the CMU focus areas as the main benefits of the capital market union: helping to absorb shocks; providing finance for the economy; enabling more effective monetary policy and creating more competitive markets. The Association for Financial Markets in Europe (2014) proposes to group the work programme for CMU into three pillars: 1) issuance of capital market instruments (the supply side); 2) long-term investment in the capital markets (the demand side); and 3) infrastructure for capital markets issuance and trading. Deutsche Borse (2015) groups the elements of the CMU into six core principles: 1) developing initiatives to revive investor trust; 2) improving availability of non-bank funding; 3) promoting financial stability; 4) increasing transparency for investors as well as supervisors; 5) fostering the harmonisation of rules and standards; 6) continuing to shape the supporting regulatory and supervisory environment. The study of Kenadjian (2015)

provides narrower focus on diversification of funding, decrease in capital market fragmentation and focus on private companies and infrastructure. Green Paper (which was further developed and presented by the European Commission (2015b) focuses on securitization, infrastructure finance and on providing financing alternatives to SMEs.

Aiming both SME and securitisation is underlined to be a strange combination by Kenadjian (2015) where SME is what everyone agrees Europe does well in its economy, while securitization is one of causes of the financial crisis of 2008/2009. Schoenmaker (2016) criticises securitisation introduced as copy of US practices: since Government Sponsored Enterprises (GSEs) in the US, known as Fannie Mae and Freddie Mac, repackage over 70% of US mortgages and provide a substantial bust to the corporate bond market. Despite the discussable sustainability of the securitisation done by GSEs, Europe lacks similar practice but has a fragmented issuance of covered bonds based on German Pfandbrief model. Existing covered bond issuance model could be a more preferred one compared to securitisation since covered bonds could be used as collateral for central bank lending, get better capital treatment and a percentage of them can count towards the new liquidity requirement under Basel III. Berg et al (2015) argues that market harmonisation is not necessarily a prerequisite for developing covered bond market in Europe, instead, countries with embryonic covered bond markets should study best practices and adapt those that fit. Schoenmaker (2016) points that the drawback of covered bonds is that they still to be covered by a minimum amount of capital, making the issuance more expensive and potentially could free up assets for securitisation. Berg et al (2015) supports the development of the covered bond market in order to allow banks to outsource risk without the help of central banks.

The action plan as presented by the European Commission is covering 2015-2019 period and is scheduled as short-medium term plan with the regular revision and monitoring, where the Capital Markets Union will not be created overnight but as the controlled process. By 2019 the CMU should be fully functioning (European Commission (2015b). The comparatively short period of what is described as fundamental shift from the bank-based to more market-based economy is widely criticized by the academic studies. The study of Veron and Wolff (2015) stresses the long-term perspective of the CMU, which cannot be a short-term cyclical instrument to replace subdued bank lending since financial ecosystems change slowly. Skabic (2016) puts the perspective of the increased capital mobility during the 1990s and 2000s, where the additional push factor was the EU enlargement to the countries of Central and East Europe. Despite the efforts already made for the increase in the capital mobility, the markets are still uneven in their development. Moreover, Acharya and Steffen (2016) add that CMU with fully integrated capital markets across member countries can only work when the status of member country sovereign bonds as risk-free assets is restored. Rusek (2015) argues that CMU alone is not enough and should be supported by substantive structural changes, especially in labour markets and taxation, to restore southern growth in the Mediterranean economies. The regulation framework, which is one of the key elements of CMU creation is in the process of its development. Deutsche Borse (2015) stresses that significant progress has been made in terms of harmonizing the regulation, still admitting that a lot of the focus has been post-crisis.

As a relatively young political initiative, CMU faces scepticism from both politicians and academics. Kenadjian (2015) stresses that the Commission only took office on November 1, 2014 and the CMU proposal was published comparatively quickly by the newly elected Commission President. Alexander (2015) and Connelly (2016) add the issue of the systematic risk as stimulated by shadow banks (non-bank credit providers), recommending regulatory controls to shadow banks. Dorn (2015) underlines that from four freedoms of movement of people, goods, services and capital, the latter gets minimum public attention, where CMU remains the discussion between only financial market participants, lobbyists and EU legal specialists. Moreover there exists a rather limited academic research present on CMU due to the novelty and vagueness of the issue. The additional information on the CMU is being introduced on the regular basis and could influence the existing perception of CMU as well as make considerable changes in the action plan implementation. The existing academic research in the area detects main CMU challenging areas which could be faced as a burden in the course

of CMU action plan implementation and thus change the overall CMU result: existing market fragmentation; lack and complexity of unified accounting standards and standardisation of issues; and uneven taxation.

1. Market Fragmentation

Market fragmentation is named as one of three main causes hindering capital mobility. Langfield and Pagano (2016) main reasons for fragmentation to inhibit market operations: 1)it confers an advantage to informed investors, who have access to multiple exchanges, and therefore increases these investors' informational rents; 2) it implies that several prices are quoted simultaneously, increasing search costs; 3) it prevents investors from taking full advantage of the "thick market externalities" arising from the fact that each additional market participant increases liquidity for all other traders

The lack of united capital market created so far is based on the traditional geographical, legislative (including taxation) and language borders. While the geographical borders are physically removed to the major extent, the language and legislative (including taxation) differences are present. The data of House of Lords, European Union Committee (2015) refers to entrenched cultural norms, where retail investors in shares and bonds retreat behind their national frontiers and 94% of European citizens shied away from buying a foreign financial product. Kenadjian (2015) finds the "home bias" on the part of investors (especially retail); large information asymmetries, including the difficulty to obtain information about cross-border investment. Donald (2015) argues that EU Market in Financial Instruments Directive (MiFID) project further fragments the market by disrupting both transparency and effective regulation.

While looking at the ways to address the existing capital market fragmentation Langfield and Pagano (2016) point that in order to reduce fragmentation of the equity markets and develop the issuance of equity, policymakers could address the current fragmentation of stock exchanges in Europe. Donald (2015) suggests that the linkage of Shanghai-Hong Kong Stock Connect and the ASEAN Trading Link is the best model for linking securities exchanges. The research by Langfield and Pagano (2016) points that favouring the consolidation of Europe's stock trading platforms is unlikely to be the best policy response to fragmentation result in a lack of competition where the model of US equity trading could be followed- to link markets together so that trades for a given security always occur at the best possible price. Micheler (2016) analyses the storage of securities as executed by custodians and stresses that currently it prevents investors from exercising voting rights and from claiming against issuers, exposes investors to the risk of shortfalls; thus the law reforms will unlikely help. The author suggests that investors should receive information about the identity of all sub-custodians that operate between them and the issuer and about their terms. Unified capital markets would stimulate the cross-border flow of funds in Europe and thus activate and to major extent create the European securities market.

2. Unified Accounting Standards and Standardisation of Issuance

To make the cross-border investment possible the information about the investment should be readable by the potential buyers of the securities. For corporate issuers possibility to read their financial statements makes the investment feasible. While the accounting standards are specific to a country, the European Commission (2015b) recommends introduction of a simplified version of International Financial Reporting Standards (IFRS) for SMEs. The latter is criticized by Kenadjian (2015) stating that "junior IFRS" for SMEs would be counter-productive as it would involve the cost of preparing a second set of financial statements, which will be not enough when the company decides to go public on a regular stock exchange, thus requiring a second conversion. Veron and Wolff (2015) stress the need for IFRS application as well as taxation unification importance since the taxation framework is moving investment flows towards one or another instrument.

Standardisation of corporate bond issuance is pointed by Langfield and Pagano (2016) for parameters such as coupons and maturities, thus reopening the existing issues and making the issues deeper in liquidity and saving underwriting fees

for issuers- a barrier many SMEs face. Standardisation will have a positive impact on comparability thus stimulating the cross-border investment.

3. Taxation

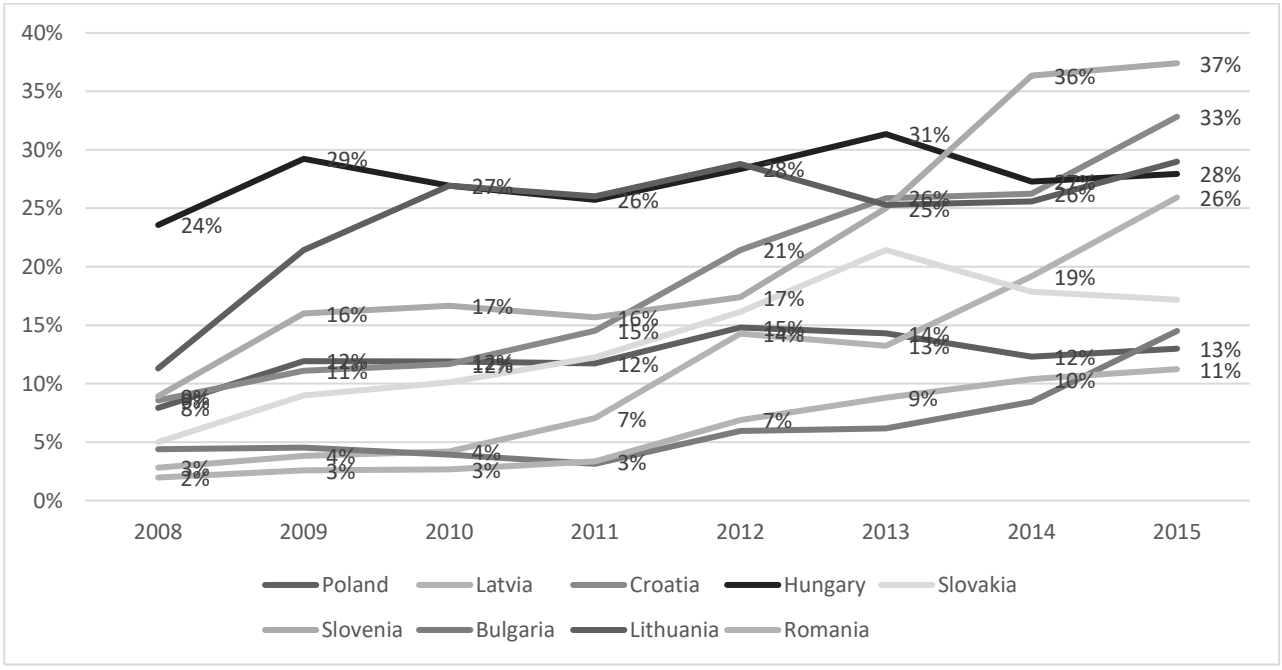
The mobility of the capital flows on both investor and issuer side is stimulated by the taxation to the major extent. Kenadjian (2015) points that under EU rules changes in EU taxation measures require agreement of all 28 Member States, insisting that this change could be seen as equivalent to finding the greatest possible obstacle and declaring it to be essential to the project. The study makes an example of failed financial transactions tax (FTT) proposed by the Commission in September 2011. FTT is pointed out by Veron and Wolff (2015) as the bad example, stating there is another route to tax changes within the EU, based on the enhanced cooperation procedure, which allows member states to agree among themselves and only for themselves on an approach to taxation.

There is no homogeneous treatment of taxation unification practices among the authors. Moreover several studies argue the importance of the local authorities to interpret the regulation in the guided direction. Dixon (2014) argues that regulating authorities should be kept on the local level, the practical application of the capital market related substantial regulation should be shifted to a more pro-European control in order to skip application of the same regulation in different way in different countries thus again stimulating uneven development of CMU. Skabic (2016) stresses the difficulties to promote reforms and implement them properly.

4. CMU Application to Latvian Corporate Bond Market

The study of Tocelovska (2016a), Tocelovska (2016b) and Tocelovska (2016d) revealed that comparing to the different peer clusters and benchmark countries the main lagging area of the development of the corporate bond market in Latvia is the size area.

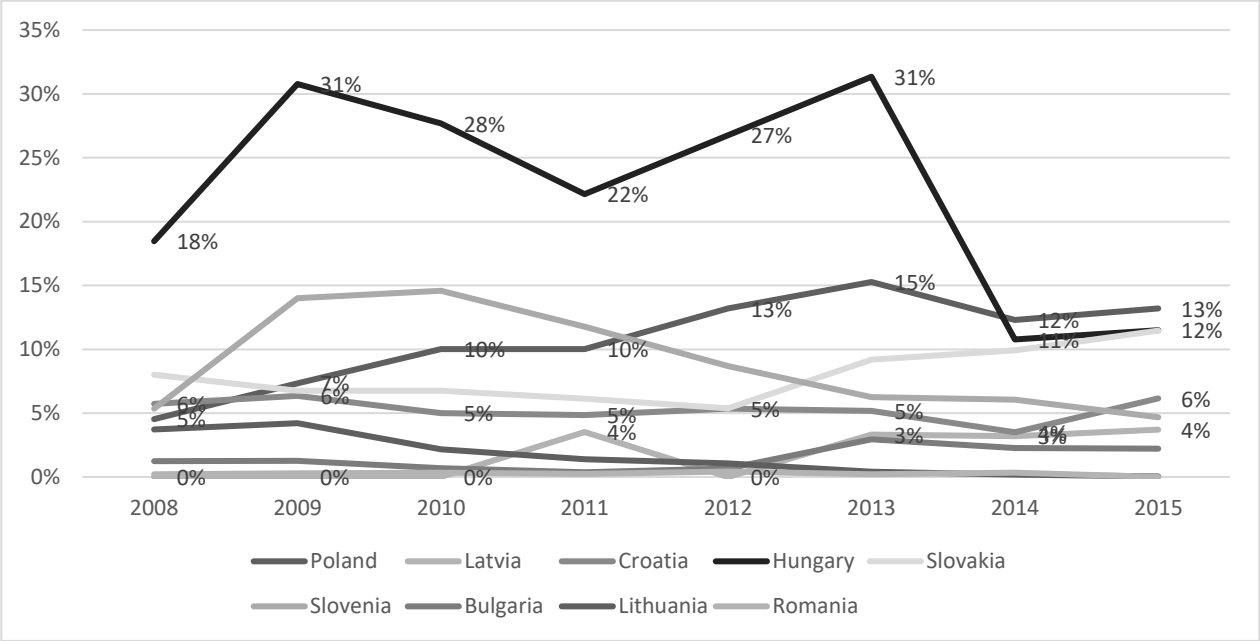
The assessment of the size area is based on the combination of both sovereign and corporate bond market segments as related to GDP, where the areas of international debt segment and corporate debt segment as related to GDP, are comparatively lagging. (Figure 1, Figure 2)



Source: Tocelovska (2016d)

Figure 1. **Ratio of international debt to GDP, %**

While the international debt segment is showing a positive uptrend in the period of 2013 to 2015, the corporate debt segment is showing a very moderate positive trend, which is in line with the peer cluster trend. The study of Tocelovska (2017) indicates the full dependence of the international debt of Latvia on the sovereign issues, thus indicating the limited access of the international investor base to Latvian corporate bond market. The cross-border trade in Latvian corporate bond segment is viable in order to stimulate the growth of international corporate debt. Cross-border initiative of the CMU actions expected in 2017 are: 1) targeted action on securities ownership rules and third-party effects of assignment of claims; 2) best practice and code of conduct for relief-at-source from withholding taxes procedures; 3) study on discriminatory tax obstacles to cross-border investment by pension funds and life insurers. The actions scheduled will potentially contribute to cross-border investment and contribute to the size increase of Latvian corporate bond market.



Source: Tocelovska (2016d)

Figure 2. **Ratio of corporate sector debt to GDP, %**

The local corporate bond market while being home for 47 public issues, should rise in its size in order to influence the rise in the comparative level of development of Latvian corporate bond market. The securitisation practices of the banking loans, as stimulated to be re-introduced by the CMU could further increase of the scope of the corporate bond market in Latvia. The importance of SME financing is not the first one in the securitisation process, still the indirect effect on the SME lending market could take place since the loans will be repackaged and sold to investors. The financial sector issuers (FSIs) segment will be further expanded by the securitisation. The action plan as scheduled by the European Commission (2015a) for 2017 are: 1) map out existing local or national support and advisory capacities across the EU to promote best practices; 2) investigate how to develop or support pan-European information systems

While the securities market is not the first choice of financing for SMEs, the steps from both stimulating demand and supply should be made. Making SME awareness of securities market financing opportunities as well as increasing cross-border investor base are among the first steps. The study of Tocelovska (2016c) challenges the presence of retail investors as the demand base for corporate bonds. The supply side found to be skewed to the financial sector side. The need for mode developed both demand (focus on retail investors) and supply side (focus on SMEs) are the main challenges as found by the study. European Commission (2015) does schedule the actions on fostering retail investment such as making EU retail investment product markets assessment by 2018, still this has limited application to the corporate bond segment.

The importance of retail investor participation as well as cross-border investment by the institutional investors is strengthened by raising age-expectance and deteriorating demographical situation is Europe thus raising the retirement age level and decreasing the state-guaranteed pension scheme. The latter puts the pressure on the individual own investment of the money resources earned. Moreover the European Commission (2015c) indicates that only 5% have direct investments in bonds and 10% in shares, while 11% own shares of a mutual fund and 33% are invested in a pension plan or life insurance while 96% of EU households have deposits with a bank. While corporate bonds could be a direct retirement investment by the retail sector it lacks focus in the existing CMU action plan thus leaving institutional investor segment as the dominating one in corporate bond instruments.

Conclusions, Proposals, Recommendations

1. While there are various historical and practical issues behind the financing gap between the European and US geographical areas, the move for a more united market-based market in Europe is supported by the academic studies. CMU as the move to a more developed alternative financing for SME segment via accessing and developing capital markets is one of the key focuses of the European Commission.

2. Capital Markets Union is an action plan, which is scheduled for the period 2015-2019. The fully working CMU is expected to be formed by 2019. While representing a great medium-term goal, the existing academic and industry studies doubt the short to medium term achievements of the plan.

3. CMU as the new initiative by the European Commission is studied by the academics to a minor extent mostly due to the novelty and vagueness of the issue. The existing studies point on various obstacles expected as the action plan evolves.

4. European Commission provides the CMU focus on securitization, infrastructure finance and on providing financing alternatives to SMEs. Securitisation as the financial instrument blamed to be one of the causes of the financial crisis of 2008, and now being revived by the CMU, draws the attention of the academics. Existing covered bond issuance model in Europe is discussed to be a more preferred one compared to securitisation

5. The academic research detects three main areas of CMU: capital markets activation for SMEs (including market harmonisation), investor base diversification and cross border investment.

6. The main CMU obstacles as discovered by the academic research are present on the level of market fragmentation, harmonisation of accounting and taxation practices.

7. In order to address existing market fragmentation of the European capital markets and link markets together the trades for a given security is suggested to occur at the best possible price could be a possible solution

8. Standartisation of accounting standards for SME financial reporting and possible application of already developed by International Accounting Standards Board “junior IFRS” is suggested by academic studies.

9. Harmonisation of taxation practices is lacking a homogeneous academic opinion or even a broader objective. The criticism of failed financial transactions tax is present in most of the existing studies.

10. Previous studies of Tocelovska (2016a, 2016b, 2016d) revealed that comparing to the different peer clusters and benchmark countries the main lagging area of the development of the corporate bond market in Latvia is the size area. CMU should be analysed from the perspective of increasing the size of corporate and international segments.

11. Organic growth of Latvian corporate bond market was shaped by the FSI not the SMEs originally targeted by the CMU. The financial sector issuers segment will be further expanded by the securitisation.

12. The cross-border trade in Latvian corporate bond segment should be stimulated due to the limited access of the international investor base to Latvian corporate bond market. CMU actions scheduled will potentially contribute to cross-border investment and contribute to the size increase of Latvian corporate bond market.

13. The securitisation practices of the banking loans, as stimulated to be re-introduced by the CMU could further increase the scope of the corporate bond market in Latvia. CMU actions scheduled will potentially contribute to promoting securitisation practices in Latvia and contribute to the size increase of Latvian corporate bond market.

14. European Commission (2015) does schedule the actions on fostering retail investment such as making EU retail investment product markets assessment by 2018, still this has limited application to the corporate bond segment.

15. While corporate bonds could be a direct retirement investment by the retail sector it lacks focus in the existing CMU action plan thus leaving institutional investor segment as the dominating one in corporate bond instruments.

16. The study recommends to further develop the CMU introduction impact on Latvian corporate bond market as more detailed application of the CMU action plan is developed and presented by the European Commission.

17. The study recommends to make in-depth Latvian SME segment analysis on its reliance on bank borrowing for the market need and potential securitisation.

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THE INFLUENCE OF BRAND STRENGTH ON BANK FINANCIAL RESULTS – THE EMPIRICAL INVESTIGATION FROM POLISH LISTED BANKS

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Abstract. Currently, brands play an increasing role in value creation for companies. For many companies, corporate or product brands constitute strategic resources which substantially contribute to a sustained competitive advantage and high rates of return. While brand contribution to company performance is well documented through various researches with respect to the consumer goods industries, in the case of the banking sector, the subject literature is rather scarce. The purpose of this article is to present the results of empirical research on the relationships between brand strength and bank performance for Polish listed banks. This article contributes to the development of marketing and the corporate finance theory. Research was conducted based on an unbalanced panel time-series sample of 12 banks companies and a 71-year observation of banks listed on the Warsaw Stock Exchange between 2008 and 2014. This study reveals a strong, significant and positive relationship between the brand strength index and different bank performance measures: interest spread, return on assets (ROA), return on equity (ROE), economic profit margin (EPM) and price to book value (P/BV) ratio.

Key words: *brands in banking, brand strength, bank performance, shareholders value*

JEL code: C23, M31, D46

Introduction

In today's knowledge based economy, intangible assets are the main sources of value creation for many companies. Nowadays, the most valuable companies are involved in widely understood service sectors, and their business models are based on intangibles like brands, customer relations or technology. In these circumstances, shareholder value maximization requires the implementation of a strategy which is focused on the creation and proper utilization of intangibles. The growing importance of intangible assets is reflected, inter alia, in higher market capitalization of companies which base their businesses on intangibles, in contrast to traditional firms, who utilize mainly tangible and financial assets. Among intangibles, the leading position from the point of view of the ability to create value is held by the brand itself. Globally, brands account for a third of gross wealth. The one hundred most valuable brands in 2008 were worth a total of 1.2 trillion dollars (Clifton, 2009). For many companies, corporate or product brands constitute strategic resources which substantially, and often decisively, contribute to a sustained competitive advantage and high rates of return. However, it is recognized that building a strong brand is associated not only with enormous potential benefits, but also with the risk of wasting resources which could be used alternatively. For this reason, academics and practitioners are struggling to gain a clearer understanding of the links between brand investments and results, both in terms of brand market appeal and, ultimately, company performance. The theoretical substantiation of the relations between a strong brand and company value is well grounded in the theory of value creation (Doyle 2008). Moreover, the results of many studies conducted primarily for companies in the consumer goods sectors, indicate a positive impact of brand equity on different measures of company performance (Mizik and Jacobsen 2005; Conchar et al., 2005; Kerin and Sethuraman, 1998; Barth et al., 1998; Madden et al., 2006). In the financial sector, the importance of the brand for an organization's success was, for a long time, underestimated, where, in the last two decades, deregulation and the technological advances

connected with the dissemination of the Internet as a distribution channel, have caused an intensification of competition. One outcome of these changes is the redefinition of marketing strategies in banking. In the financial sector, customers tend to have difficulties with a clear assessment of competitive offerings. Bank products move toward convergence and any differentiation based on service innovations may be rapidly adopted by competitors. Additionally, banks converge in terms of utilized business models, IT solutions and service quality standards. Therefore, in order to achieve a sustained differentiation of their offers, banks have to rely on longer lasting unique characteristics of their products. Their brand is probably the only available resource that can be harnessed for this task. In this context, a strong brand must be treated as a key success factor for the bank, whose proper utilization is a prerequisite for the achievement of a sustainable competitive advantage. However, theoretical justification of the importance of the brand for a bank's success is insufficient from the point of view of business practice. To encourage banks to incur significant expenditures on brand creation and promotion, it is important to provide empirical evidence for the link between brand strength which is the result of brand investments, and bank performance.

The purpose of this article is to present the results of empirical research on the relationships between brand strength and bank performance measures for Polish listed banks. The article begins with a discussion on the evolution of the perception and significance of its brand to a company, then presents the concept of the mechanism of the impact of the brand on a bank's value. The article continues with a review of the various methods for the measurement of value creation for shareholders. The latter part deals with the presentation of the results of research worldwide as well as the author's own research on the effect of the brand on value for shareholders. The article is summed up with conclusions and recommendations with regard to further directions for research.

Research Results and Discussion

1. The Brand and Brand Equity

In prevailing perceptions, the brand is the name or logo under which a product is marketed. However, not every name or logo plays the role of brand in modern marketing. The difference between a "simple" name and a "real" brand lies in the fact that the name does not in itself carry connotations beyond its original sense. The name becomes a brand when consumers associate it with other meanings (Calkins 2005). If these associations convey a favorable message from the customers' perspective, they positively influence the buying behavior of said customers. The brand changes the way in which the product is seen and its reception by the consumer. The perception of the product by the consumer is often more important than its functional qualities and characteristics as far as the propensity to buy is concerned. This effect is reinforced by the fact that consumers are regularly unable to objectively evaluate the real value of the product.

Over the years, the brand has evolved from a symbol of ownership to a social and cultural phenomenon. After functioning for a long period of time as a symbol of product ownership and origin, the brand has gained a new function, as a product of meaning. The meaning of the brand is the result of both the brand's owner's intentions, manifested in conveyed messages, and the consumers' interpretation of these messages, shaped, to a great extent, by experiences. Many brands live their own lives, beyond the intentions of their owners and interpretations of their consumers, which is represented for example in memes based on brand names (Berthon et al, 2011).

The term "brand" is used very frequently and, depending on the context, may have different meanings. According to the "classical" marketing definition – "a brand is a name, term, sign, symbol, or design, or combination of these intended to identify the goods or services of one seller or group of sellers and to differentiate them from those of competitors" (Kotler and Armstrong, 1994). The brand may be defined as a set of customer experiences that result from the multiple interactions with different aspects of the product marketed under a given name. In the context of brand measurement, the

term brand equity is now used in subject literature. Keller defines brand equity as, "The differential effect of brand knowledge on consumer response to the marketing of a brand" (Keller, 1993). According to Aaker, brand equity is "the set of assets and liabilities linked to a brand, its name and symbol, that adds or detracts from the value provided by a product or service to a firm and/or to the firm's customers" (Aaker, 1991). The brand makes a difference if customers select specific brands when other product parameters are equal, or customers are willing to pay more for the same level of quality (Rambocas et al, 2014).

Brand equity can be measured with multiple constructs. Some of the most popular brand measurement models are: Brand Asset Valuator, Brand Dynamics or The Brand Equity Ten (Salinas, 2009). These models measure different aspects of brand characteristics in competitive environments. Therefore, they are useful in evaluating brand potential and prospects in a given market. However, for the purpose of evaluating the relations between brand equity and company performance, a single coefficient which summarizes the multiple dimensions of the brand is required. This enables the analysis of the overall impact of the brand in all aspects of its influence on company performance. In this study, as a measure of overall brand impact, the Brand Strength Index (BSI) was selected. The Brand Strength Index was taken from the annual ranking of the most valuable Polish brands, which has been published annually since 2004 by the economic branch of Rzeczypospolita daily. A brand's strength is determined by comparing its position with competing brands based on the results of market research conducted on a representative sample of adult consumers in Poland. Brand strength is a multidimensional construct based on nine individual indicators: consumer preferences, brand awareness, priority in mind, brand loyalty, brand references, perceived brand quality, brand prestige, brand value (perception of price in relation to quality) and industry affiliation. Each of these areas has been assigned a weight by a panel of experts. The sum of weights is 100. Table 1 presents the weights for brand strength indicator components.

Table 1

Weights for brand strength components

Brand strength component	Weight
Consumer preferences	0 - 15
Brand awareness	0 - 3
Top of mind	0 - 3
Brand loyalty	0 - 16
References	0 - 8
Prestige	0 - 20
Perceived quality	0 - 20
Perceived value	0 - 5
Industry affiliation	0 - 10
Sum	0 - 100

Source: (Rzeczypospolita 2009)

The brand strength index belongs to the interval from 0 to 100 points. A score of 100 points is for the ideal brand on the Polish market, while 0 points is assigned to a brand of null significance. In practice, Polish brands covered in the survey range an interval from 32 point for the weakest brand to 82 points for the strongest brand.

Brand strength index of the Polish banks which are subject of this study varies from 33,66 points to 60,4 points. These banks can be generally divided into two groups. First is populated with banks which originally were 100% state-owned and were founded before 1989, when transition from centrally-planned economy to market economy begun. Some of these banks after 1989 were the subject of takeovers by foreign financial institutions, but maintain their original brand name, at least as a co-brand functioning parallely with new owner brand. Second group are banks which were funded by private entities and then went public.

2. Brands in Banking

Although the belief that the brand can contribute significantly to company performance is widely accepted by theorists and practitioners with respect to the consumer goods industries, in the case of the banking sector, the problem of brand management was considered for a long time to be of secondary importance. Traditionally, the role of the brand in banking was limited to its primary function - the brand was solely an indicator of the origin of the product. Bankers perceived the brand primarily as the ID of an organization and not necessarily as an effective tool that could influence its performance. The reasons behind the relatively low popularity of brands in the financial sector can be derived from two groups of conditions, external – connected with the nature of the industry, and internal – connected with "banking" mentality. The most important external limitation is the low transparency of the financial market and the high levels of state regulation resulting from the importance of the industry to the economy. This, to a great extent, restricts the freedom for shaping the relationship between the bank and the client. Another industry specific limitation is connected with the large variety of bank customers - the average bank offers its services to different groups of customers who have different expectations. This results in difficulties in creating a single brand "message" in the promotion of banks. Another phenomena which restricts the efficiency of the classical promotion activities in the banking industry is the "blind" customer loyalty to banks - the lack of incentives and the will among customers to change their bank in general, and specifically as the outcome of marketing messages. Finally, the similarity of products offered by various banks results in the inability to differentiate the offer, which lies at the center of brand promotion. Another group of reasons behind the underutilization of brand potential in the financial sector is rooted in the mentality of bankers. There is a fundamental mismatch between banking and marketing mentality. Marketers are directed to meet the needs of customers, and therefore the reference point of their actions is the customer. Meanwhile, the whole banking organizational culture is oriented on a system in which the most important reference point is the existing procedures. In such an environment the adaptation to the needs of customers is done within the constraints of the system. These two mentalities lead to the establishment of a relationship with the customer on different grounds and of a different type, and are therefore difficult to reconcile within a single organization (Interbrand, 2001). Due to the fact that the mentality of the bank is primary, and shapes the strategy of the bank in a decisive way, activities in the field of brand building, typical for the marketing mentality, is of secondary importance in banks.

However, from roughly the beginning of the first decade of the twenty-first century, the banking sector has been the scene of far-reaching changes in the approach to the treatment of brands. This is due to a number of circumstances, one of which was the realization of the untapped opportunities in this area in response to the emergence of a number of publications in the subject literature presenting brand performance measures (Chernatony et al, 2004) or proving the positive effect achieved by brands on bank performance (Ohnemus, 2009; Root, 2003). For example, one analysis shows that the average value of a bank's brand accounts for some 10% of its market capitalization, while in the case of companies offering durable consumer goods, it is around 35% (Shyder, 2012). From this point of view, the importance of the brand for the banks is visible, although significantly lower than that of companies in the sectors of consumer goods. Ohnemus conducted a study on optimizing the amount of spending on the brand. Research conducted by this author showed that there is a point of equilibrium determining the optimum size of expenditures on the brand in relation to revenues (Ohnemus, 2009).

A more important contribution to the amplification of the role of branding in banks was played by the processes of the globalization of financial markets and the wider use of information technology in the delivery of services and products. These processes resulted in a series of structural changes in the industry, such as: deregulation, consolidation, the emergence of new media and distribution channels, increased competition between financial institutions and also

competitive pressures from companies offering financial services from outside of the sector. In response to these global trends, a number of banks introduced a global strategy. The implementation of this strategy has led to a number of mergers and acquisitions in the financial sector, which resulted in new challenges of organizing and managing the growing portfolio of brands, operating in parallel, within one organization (Nellis et al, 2000). In many cases, the answer to this challenge was the introduction of the single global brand strategy (Robinson, 2007). Paradoxically, the global financial crisis of 2008 also contributed to the growing importance of the brand to banks. The crisis affected not only a bank's balance sheets, but also its reputation. As a result, many financial institutions suffered from the loss of their credibility, not only among customers, but also among society as a whole. Additionally, customers have become more cautious and selective about the institutions to which they entrust their money. Consequently, banking services, from being relatively standard, have become high involvement and emotional products for customers. For such products, brand names that are associated with reliability and safety are crucial for building trust and minimizing risk between consumers and banks. Thus, the corporate brand is becoming a key element on which banks can build differentiation and competitive advantage today.

3. How the Brand Influences Bank Performance

The influence of brand strength on bank performance can be justified logically, based on economic theory, more specifically – using value creation equation. The causal link between the strength of a bank's brand and its performance can be traced in relation to market, financial and shareholders value measures respectively - Figure 1.

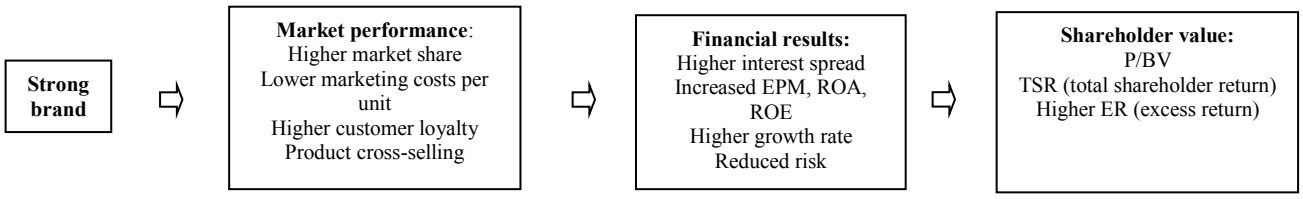

Fig. 1. **Strong brand – bank performance relation**

Source: author's construction

Banking services are characterized by specific features that distinguish them from the offers of other service companies. The relationship is based on trust, the carrier of which, from the customer perspective, is the brand. Banks, by having a strong brand, can achieve the following market benefits:

- Increased spread, i.e. the difference between interest rates paid on deposits and interest obtained on loans. Customers placing their money in a trusted bank, agree to get lower interest rates on deposits than in the case of a less trusted bank. As a result, the difference between interest rates on loans and deposits is higher for banks with stronger brands.
- Attracting more customers' funds, which allows for an increase in lending.
- A larger number of customers translates into an increase in revenues from fees and commissions on realized services.
- The possibility of cross-selling banking products – customers, on connecting with the bank, on the occasion of opening deposits or taking out a loan, may use other banking services (credit cards, insurance, currency exchange, escrow accounts, etc.).
- Reduced unit costs of marketing – the marketing budget is spread across a larger number of customers.

The above market benefits translate into an improvement of the key financial indicators that determine bank value. These are: return on capital (ROIC), revenue growth and cost of capital. The value of the bank is the present value of

future cash flows, discounted at an appropriate rate which takes into account the risk to these cash flows. In its simplest form, the key value formula can be represented by the following equation (Koller et al, 2005):

$$EV = \frac{NOPAT_1(1 - \frac{g}{ROIC})}{wacc - g}$$

Where:

EV – company value

NOPAT1 - operating profit after tax in the next period

ROIC - return on invested capital

g – NOPAT growth

wacc – weighted average cost of capital

After the transformation of above formula we get:

$$EV = IC_0 + \frac{IC_0(ROIC - wacc)}{wacc - g} = IC_0 + \frac{EP_1}{wacc - g}$$

Where:

IC_0 - book value of invested capital

ECP_1 - next year's economic profit

The formula above shows that if economic profit is equal to zero (ROIC=wacc), the company's value is equal to the book value of invested capital. The relationship between the value (EV) and the value of invested capital (IC), is determined by the ability of a company to obtain extraordinary returns on invested capital. In principle, brand value, as well as other off balance sheet intangible assets, is not included in the invested capital, however, it constitutes a part of a company's value. Thus, if the ratio of company value to invested capital (EV/IC) equals one, it means that the company does not have valuable intangibles (e.g. brands). If EV/IC >1, it means that a company possesses intangible assets which result in achieving returns (ROIC) above the cost of capital employed. Brand value should be reflected in the market value of the bank. This assumption stems from the hypothesis of "the efficiency of capital markets", which says that market value reflects all available information on expected cash flows. A strong brand affects all components of the model of value creation, i.e.: operating profit after tax (NOPAT), return on capital (ROIC), company growth rate (g) and cost of capital (WACC). Consequently, a strong brand should positively influence the profitability of a company, measured by return on assets (ROA) and return on equity (ROE) ratios. A strong brand should also be reflected in positive interest spread – the difference between interest gained on loans and interest paid on deposits. Finally, the stronger and more valuable the brand, the higher the ratio between the market value of the bank and the value of the capital invested. As the correlation between EV / IC and P / BV is close to 1, a strong brand should positively influence the P/BV ratio of a bank. The purpose of this paper is to investigate the relations between brand strength and bank performance measures. Therefore, based on the analysis carried out, general hypothesis is put forward:

There is a positive association between the Brand Strength Index (BSI) ratio and bank performance. This general hypothesis will be tested through the following five specific hypotheses:

Hypothesis 1 - There is a positive association between the BSI and interest spread

Hypothesis 2 - There is a positive association between BSI and ROA

Hypothesis 3 - There is a positive association between BSI and ROE

Hypothesis 4 - There is a positive association between BSI and P/BV

Hypothesis 5 - There is a positive association between BSI and Economic Profit Margin (EPM)

4. Research Methodology and Results

The sample consists of 12 banks listed on the Warsaw Stock Exchange between 2008 and 2014. Data on banks' profitability, economic profit margin and price/book value were hand collected from financial statements. Data on interest rates on deposits and loans were derived from the Bankscope database. Data on the Brand Strength Index were collected from the ranking of "The Most Valuable Polish Brands" published annually by the newspaper *Rzeczypospolita*. The survey excluded the banks listed on the Warsaw Stock Exchange for which there is no data on the strength of their brands. Moreover, the observations with missing financial data were excluded due to the fact that some banks were listed on the stock exchange for only a part of the analyzed period. Consequently, calculations within each model were conducted based on available observations. This results in an unbalanced panel sample of 12 companies and, depending on the model, up to 71 firm-year observations.

The following model is used for testing the hypothesis:

$$Y_{it} = \alpha_i + \beta X_{it} + \varepsilon_{it}$$

where α_i is an expression of constant, Y_{it} includes the dependent variables, i.e. ROA, ROE, economic profit margin, interest spread, P/BV ratio. Vector X_{it} contains the independent variable, i.e. Brand Strength Index, while ε_{it} describes random disturbance. As the range of data covers seven years, to estimate the parameters of the model, panel regression has been used. Based on the results of Wald and Breusch-Pagan tests, an ordinary least squares regression was selected for all models.

Table 2 presents the descriptive statistics and correlation matrix for the variables considered. The mean of brand strength is 47.42 points with the range of variation from 33.66 points to 60.40 points. The interest spread varies from 1.09% to 4.98% with a mean equal to 2.86%. Return on assets range from -0.35% to 3.03% with a mean of 1.28%. The mean of the return on equity is 9.70% with a range of variation from -2.87% to 22.50%. Economic profit margin is diversified in the sample, and ranges from -8.70% to 21.60% with a mean of 5.17%. Finally, the mean of P/BV is 1.61 with variation from 0.23 to 4.81. A mean P/BV above 1 means that, on average, analyzed banks possess some intangible assets which are responsible for expectations of future returns above the cost of capital.

Correlation analysis provides an initial preview for the analysis of associations between dependent and independent variables. Table 2 shows the results of Pearson pairwise analysis. It indicates that all dependent variables are significantly and positively associated ($p<0.01$ or $p<0.05$) with the independent variable – brand strength. Consequently, the results of correlation analysis entirely support hypotheses 1 to 5.

Table 2

Descriptive statistics and correlation matrix

	N	Min	Max	Mean	St. dev.	Brand Strength	Interest spread	ROA	ROE	P/BV	EPM
Brand Strength	71	33.66	60.40	47.42	6.16	1.00					
Interest spread	70	1.09%	4.98%	2.86%	0.90%	0.346**	1.00				
ROA	71	-0.35%	3.03%	1.28%	0.86%	0.669**	0.463**	1.00			
ROE	71	-2.87%	22.05%	9.70%	5.52%	0.677**	0.298*	0.920**	1.00		
P/BV	71	0.23	4.81	1.61	0.72	0.538**	0.284*	0.585**	0.543**	1.00	
EPM	36	-8.70%	21.60%	5.17%	7.97%	0.519**	0.343*	0.704**	0.670**	0.775**	1.00

Note: Significant at $p < 0.05^{*}$; $p < 0.01^{**}$

Source: author's calculations

After initial testing of the proposed hypotheses with correlation analysis, the next step is testing the hypotheses through linear regression models. As the subject of analysis are time series data, to estimate the parameters of the model, panel analysis has been used. Table 3 exhibits the results of the regression coefficients for the explanatory variable – Brand Strength Index, for all models.

Table 3

Regression coefficients

	Dependent variables				
	Model 1 Interest spread	Model 2 ROA	Model 3 ROE	Model 4 P/BV	Model 5 EPM
Const	0.482 (0.832)	-3.127*** (0.628)	-19.079*** (4.010)	-1.398** (0.602)	-27.894*** (9.547)
Brand strength	0.050*** (0.017)	0.093*** (0.013)	0.607*** (0.084)	0.063*** (0.013)	0.691*** (0.198)
N	63	64	64	64	35
Adjusted R-squared	0.105	0.438	0.449	0.278	0.247

Note: $p < 0.1^{*}$; $p < 0.05^{**}$; $p < 0.01^{***}$. Standard error is given in brackets.

Source: author's calculations

Regarding model 1, adjusted R^2 is 0.105. It shows that the explanatory power of model 1 is the lowest among all the tested models. In model 1, independent variable BS (brand strength) has a positive and significant impact on interest spread (β=0.05; $p<0.01$). Results from model 1 support hypothesis 1. The explanatory power of model 2 is 0.438. In model 2, independent variable BS (brand strength) has a positive and significant impact on return on assets ratio ROA (β=0.093 $p<0.01$). Results from model 2 support hypotheses 2. In the case of model 3, its explanatory power is the highest among all models and equals 0.449. In model 3, independent variable BS has a positive and significant impact on the return on equity ratio ROE (β=0.607 $p<0.01$). Results from model 3 support hypothesis 3. The explanatory power of model 4 equals 0.278. In model 4, independent variable BS has a positive and significant impact on return on price/book value ratio P/BV (β=0.063 $p<0.01$). Results from model 4 support hypothesis 4. Finally, in the last tested model, 5, its explanatory power equals 0.247. In model 5, independent variable BS has a positive and significant impact on return on the economic profit margin EPM (β=0.691 $p<0.01$). Results from model 5 support hypothesis 5. Signs of the parameters next to independent variable – brand strength, in the case of all models are consistent with expectations.

Conclusions, Proposals, Recommendations

The aim of this article was to present a results of the investigation of the links between brand strength and company performance in banking sector. Independend variable - brand strength was measured here with brand strength index which comprises nine individual indicators of brand market position. Company performance was represented by five dependend variables: interest spread, return on assets, return on equity, price to book value and economic profit margin. As expected, the study confirmed a positive and statistically significant relationship between the brand strength and all dependend variables. Thus the results of this study support all specific hypotheses and therefore, general hypothesis about positive relationship between brand strength and bank performance. The results of this research contribute to the development of both, marketing and corporate finance theory and could have several practical implications. Primarily, bank managers receive additional evidence for brand investments legitimacy. Additionally investors, based on research findings, can

utilize brand strength of banks as an indicator which is useful for selecting investment objectives. The results of this study are also subject to limitations associated mainly with the data on which the results are based. Research was conducted based on time-series data for seven years and covered only 12 banks from one country. Further verification of the findings on positive relationships between brand strength and bank performance should be based on data extended beyond one country. Inclusion of control factors into regression models should also be considered.

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SCENARIOS OF LOCAL GOVERNMENT INTERVENTION IN CASE OF MARKET FAILURE. THE CASE OF LATVIA

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Abstract. Local and regional governments have always been important players in economic development. They create jobs as employers and as purchasers of inputs from the private sector. Local governments are often responsible for regulating local economic activities and providing the social and physical infrastructure which complements private economic activities. In liberal market regimes the opinion is generally divided on whether municipalities who intervene in market in developing their own government enterprises, promote local economic development or, in contrary, create an additional competition in private sector. The aim of the article is to outline possible scenarios for local government intervention in order to correct market failures at the local level. The methodology is based on the literature review about local economic development, and the concept of market failure. This allows to distinguish between a variety of approaches to local economic development policies, such as the business-oriented approach, or the poverty reduction-oriented approach, such as the reduction of unemployment. Additionally, an e-mail survey of Latvian local governments conducted in May of 2016 about their views on local economic intervention provided an additional insight in describing the scenario.

The assessment of economic role of local and regional governments shows that in nearly all EU countries local and regional authorities are allowed to engage in economic activity. In some cases, there are restrictions or safeguards such as prohibitions on exercising a monopoly, ceilings (whether absolute or percentage) on equity participation, or a requirement that activities be reconcilable with the local authority's interests. Theoretical investigation of the concept of market failure as well as the results of the survey show that local government's interpretation of the market failure in practice largely depends on it's the strategic orientation and economic capabilities. Before the implementation of the particular method of correcting the market failure, the local government need to be aware of whether the free market mechanism can solve the specific problems. In cases where the provision of services for the private market players is a high risk, risk mitigation strategies or alternative economic development models have to be considered.

Key words: *economic intervention, local governments, market failure, scenarios*

JEL code: H70 - State and Local Government

Introduction

The discussion about economic intervention by local governments has gained a momentum in response to post-austerity measures which have significantly limited the financing available for local investments, and motivated local governments to explore other streams of revenue. The decisions about the nature and the extent of economic intervention can take place in complex environment involving different legal, value based and strategic considerations, and therefore can be rather contentious. In *market-oriented approach* the priority for performing economic activities is assigned to private companies. It is assumed that the benefits of private incentive driven economic growth would "trickle down" and benefit the population, while the economic role of the local and regional authorities is seen as secondary (Richardson,

1973). In the *interventionist approach* it is expected that market outcomes will produce many adverse effects and therefore some sort of government intervention (Lamothe & Lamothe, 2016). These interventions can take shape in many forms and lead to diverse actions. Defensive actions can be aimed at preventing local business closures. They can also be aimed at promoting *promoting structural changes* and key sectors towards which investment, training and other measures will be directed. Finally, some *specially targeted measures* can be undertaken, such as training and employment initiatives in favour of economically disadvantaged groups (Council of Europe CoRe, 2015).

Local and regional governments have always played an important role in local economic development. Local governments are responsible for managing day to day activities in Europe's fast growing cities, which provide more jobs and services, more high-growth firms, higher employment rates, better accessibility and connectivity that are all factors for boosting the overall productivity of national economy. For EU as a whole, local governments manage about 43% of total public investment. Local governments manage more than a half of total public investment Bulgaria, Italy, Romania Finland, France, The Netherlands and Sweden. In Malta, Cyprus and Greece local government's share is the lowest accounting for 20% and lower (EC, UN Habitat, 2016: 195).

After the financial and economic recession of 2008-09 local governments were the first to encounter the social costs of economic problems. Although local governments are often positioned on the frontline of combating economic and social problems, and are directly involved in distributing public aid, central government transfers to local governments in EU countries have declined since 2010 (EC, UN Habitat, 2016: 194). This has strongly affected the local authorities especially those which are more dependent on central government transfers – e.g. Hungary, the Netherlands and the UK. From 1995-2015 local government expenditures relative to total government expenditure in the EU decreased from 24,5% in 2008 to 23,5% in 2015. So did local government expenditures relative to the GDP from 13% (2010) to 11% (2015) reaching the level of 1995 (EC, UN Habitat, 2016: 191). Local investment in EU countries also fell from it's peak in 2009 when it was 1,6% of GDP to just 1,3% in 2014. These reductions are explained by growing expenditure for social benefits which left less space for investments. According to OECD-CoR survey 39% of local authorities reported a reduction or stagnation in borrowing for investments since 2010 and only 12% stated a increase (OECD-CoR, 2015). In order to increase the efficiency of administration, many countries began or continued to merge the municipalities. In the early 1990s, Europe had a total of 97,500 municipalities, but by 2014 only about 92,000 (EC, UN Habitat, 2016: 191-3).

The need for economic intervention by local governments is facilitated by several factors, like the need for *inward investment*, as well as *social* factors, such as unemployment, crime and unequal distribution of resources. In addition, many municipalities are looking for the opportunities to *create technological and scientific momentum* necessary for economic development by creating enterprises (Putnins, 2015). Intervention can also be driven by simple motivation of *profit seeking*, thus earning more with services that are profitable and can be provided effectively by local government enterprises. Theses services include public transport, energy, water supply, sewage treatment, household refuse collection and treatment, site development for economic and business enterprises.

Much has been written about government actions to support business and entrepreneurship, however the literature on the role of local governments has been more limited (OECD, 2004). In many countries market regulation guidelines suggest that before intervening public authority should make a thorough economic appraisal of the intervention backed up by a technical feasibility study covering all aspects of the operation, and the economic appraisal which then can be weighted against the social appraisal (Council of Europe CoRe, 2015). Based on the study of Latvian local governments, this paper seeks to provide more insight into local government market interventions. This is done by developing a scenario of appraisal for local government economic interventions. The scenario is intended to provide the guidance of arriving at transparent and effective decisions for local governments.

Local Government Decisions Over Market Intervention

In countries of the European Union (EU) local and regional governments are allowed to engage in economic activity. In some cases, there are restrictions regarding monopoly or equity participation, or a requirement that activities to be reconcilable with local authority's interests. Generally, local authorities are required by national laws to stay within their field of responsibility and their economic activities must be compatible with their basic function (Council of Europe CoRe, 2015).

Decisions over desired forms of intervention are typically affected by:

1. *legal constitutional and institutional framework,* placing limits on the extent and nature of economic activities undertaken by local and regional governments in particular country;
2. *various stakeholder groups* and their specific interest that are usually motivated by some form of profit seeking and are looking to change the rules of the market;
3. *strategic outlook and orientation of local government* which can be:
    a. *business-oriented*, focusing more on business infrastructure development (pro-business)
    b. *poverty reduction*-oriented focusing on as the reduction of unemployment (pro-poor) (Hague et. al, 2011)

For many local and regional governments development approaches have become much more comprehensive and diversified. Many local governments no longer limit their support to large scale manufacturing industries and agriculture. Instead they take comprehensive approach and direct their support to business related areas, such as education, housing, personal social services. To address this growing array of approaches we refer to Hague et. al (2011) who distinguishes between the situations in which free market solutions provide optimal outcomes in value and equity, and the situation where free market cannot provide optimal solutions (see, Fig 2). Market solutions fail to provide optimal results because of the lack of resources (e.g. limited human resources) or incentives (e.g. no private incentive to invest). In addition to market performance we also emphasize the dimension of economic competitiveness vs. sustainability. Some local governments choose not to opt for creation of jobs at any price. Instead they aim to attract high quality jobs, or direct their investments towards preserving the environment (e.g. limiting traffic congestions, and pollution), maintaining historical heritage, and increasing the quality of life. ("Smart planning" approach*)*.

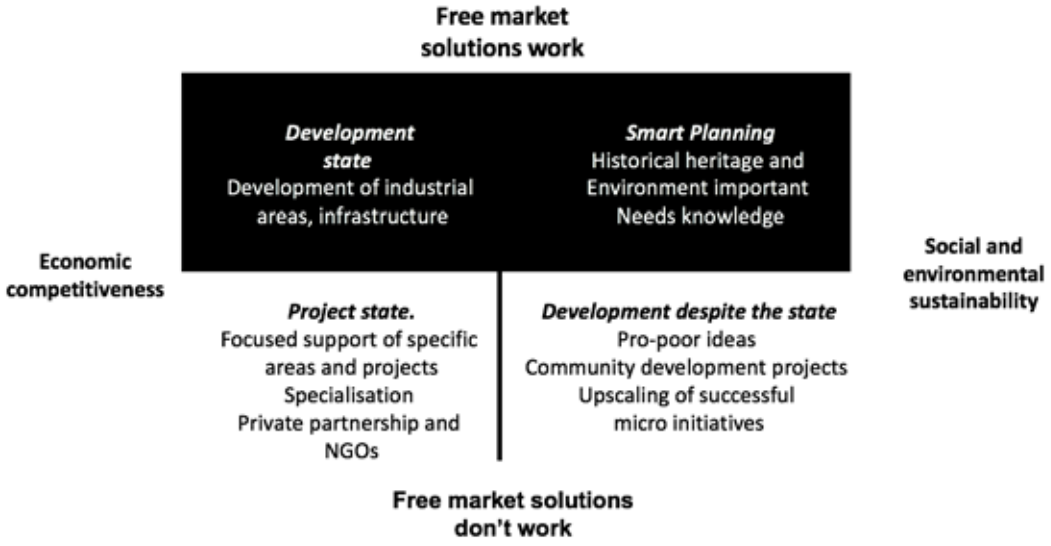


Fig. 1. **Local Development Strategies of Local and Regional Governments**
Source: adapted from: Hague et.al. (2011)

In the "Development State" approach, the market, in general, is capable of providing the benefits for the population. In the "Smart planning" approach rapid economic development is not necessarily sustainable, therefore local government purposefully tries to restructure its economy by strategically attracting the needed investment, knowledge and human resources. Similar approach is taken in the "Project state" approach where local government decides to focus it's efforts on developing specific area, location, project or sector. Since "Project state" have the tendency to suffer from market failures, local governments have incentive to adopt so called "contract culture" which aims at combining external financial resources (private sector or development funds) and local financing which is provided directly or by in kind contributions. "Development despite the state" approach is taken by local governments who see themselves deprived of opportunities of market-lead development and are therefore more concerned with nurturing social and environmental capital. By adopting this approach, local government can decide to play pro-active role in seizing the opportunity of small scale community development. This can also be attributed to alternative development approaches (Buch-Hansen, Lauridsen, 2012). In order to ensure the critical mass needed for territorial development, local governments can directly participate in projects that replicate and/or upscale successful micro-level initiatives.

Economic instruments available to local and regional governments have been widely discussed (OECD, 2004; OECD, 2003; OECD). Generally, these instruments fall into three groups – direct aid, indirect aid and general aid. Similar structure of economic instruments in case of Latvian local governments has been recently discussed by Grizāns (2015). Table 1 outlines each group of instruments.

Table 1

Economic Instruments Available to Local and Regional Governments in Europe

Direct aid

- Subsidies and other payments
- Loans and reduced interest rates
- Sale or let of land on advantageous terms
- Leases with purchase option
- Minority share ownership in private business

Indirect aid

- Provision and equipment of industrial estates and trading estates
- Surveys, consultancy services, management advice and advice on legal and tax matters
- Training/retraining facilities
- Help with provision of worker amenities (worker transport, canteen facilities)
- Aid to maintenance of public services necessary to local community
- Temporary provision of premises or common facilities as start-up aid to the young entrepreneur
- Aid to partnerships between schools and industry

General aid

- Trade fairs/exhibitions
- Development of high-technology centres
- Local research centres, network cooperation with other centres
- Aid to ownership transfer/purchase of an enterprise
- Quality of life services (public services adapted to firms' needs, improvement of the natural environment s
- The local authority's image

Source: based on: Council of Europe CoRe, 2015

Before taking an action of economic intervention local government need to establish whether the free market mechanism can be applied to solve the specific problems (Rapaczynski, 1996). In cases where the provision of services by the private market players is putting the population at high risk, a variety of risk mitigation strategies or alternative development models can be considered (Buch-Hansen, Lauridsen, 2012).

There is no universal understanding about what constitutes a market failure in local economic development. Few recent studies have addressed related areas. Hefetz and Warner (2007) have looked at the privatisation in the cities of United States. Putnins (2015) has looked on the role of state and local government owned enterprises. The study by Deloitte (2013) has examined the impact of Latvian local government enterprises in providing services.

The market failure definition used by OECD is widely used in academic literature. According to this definition market failure is a general term to describe situations in which market outcomes are not Pareto efficient. In these situations, government interventions usually occur (Khemani, Shapiro, 1993).

The literature distinguishes between three main causes of market failure:

1. *Inefficient pricing mechanism* caused the market failure, as there may be cases where a particular product or service on the market is either produced in insufficiently or too large quantities.
2. *Incomplete information* may lead to a situation where small businesses are unable to take full advantage of the work, as well as the opportunities offered by the financial markets, or health care. In this case service recipient is discriminated against for a given amount of service received.
3. *Equivocal ownership*. In this case market participants do not take care of the reduction of transaction costs (does not internalize costs). Therefore, the market is being distorted and created by external effects (e.g, inefficient heating systems or sewer) (Boettke & Coyne, 2011; FSA, 2006; Horvath, 2004).

These causes of market failure may lead to one or the combination of several market failure situations, such as:

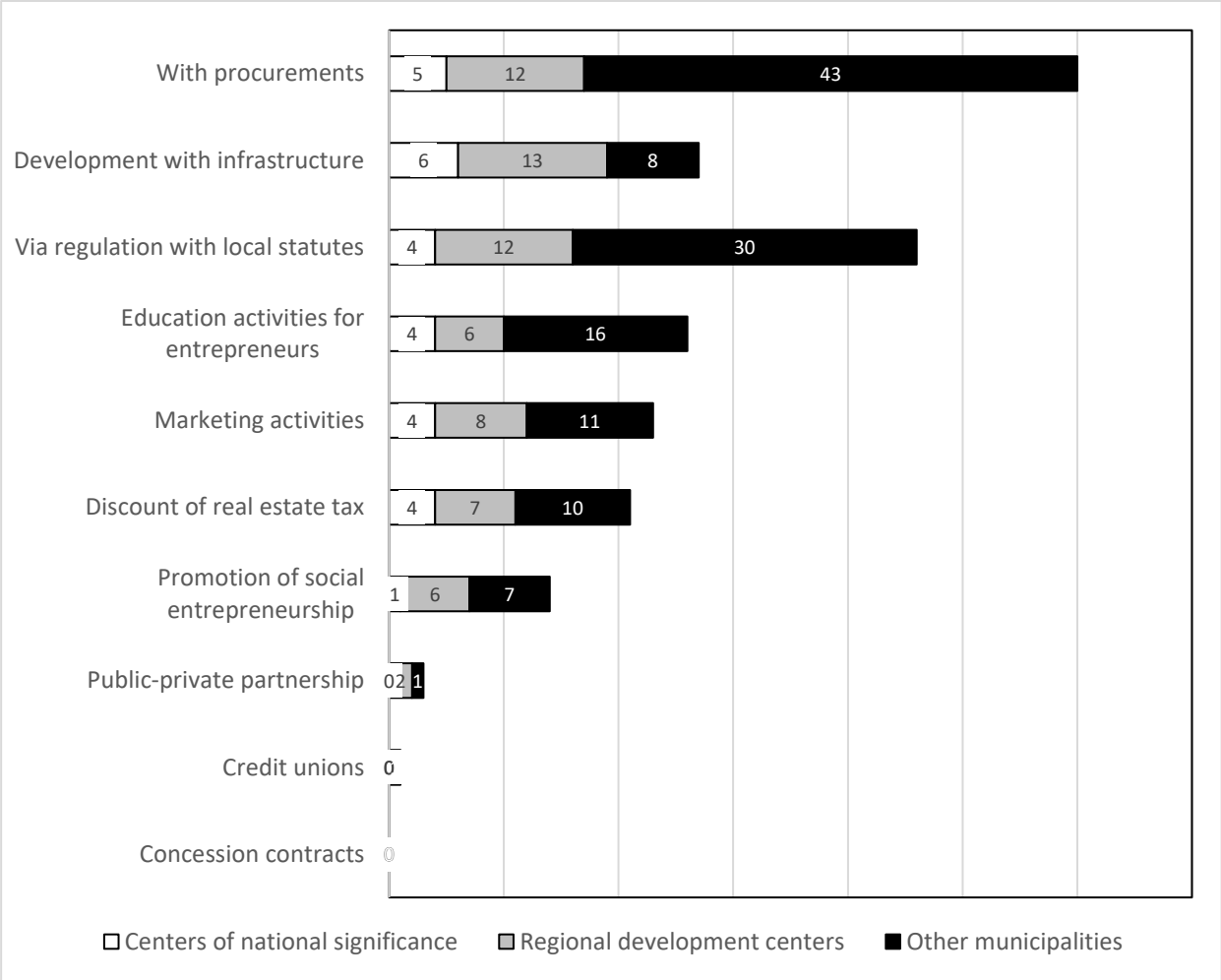
1. *Market with no or limited competition* with dominance of monopolies or lack of certain incentives, such as high interest credit resources
2. *Unfavorable externalities.* Such externalities are typically caused by external factors outside the municipality, for example the neighboring effect of urban areas in causing the rapid outflow of labor. However, externalities can also be internally caused. In this *instance, for example, intensive competition* between public passenger service providers can actually decrease the quality and availability of transportation service due to conflicting schedules.
3. *Absence of certain public goods*, such as labor, infrastructure (Head, 1972).
4. *Informational asymmetry* – absence of information about market opportunities, services, costs, one-sided information about the local government etc. (Pūķis, Jaunsleinis, 2014).

Methodology

The study was designed to assist to the elaboration of scenario which involves several steps in diagnosing the market failure. To accomplish this, in addition to theoretical literature review, an e-mail survey of local governments was performed. The survey consisted of questions aimed at identifying existing forms of entrepreneurial support as well as testing the views of some central assumptions related to market operations. In total 119 e-mails were sent. From those 76 valid answers were received. The surveys were addressed to Development departments of Municipal administrations, since these departments are usually responsible for serving the local business community. The results of this survey are fully described in the study "Opportunities of local governments to support the development of local economy" commissioned in 2016 by the Association of Municipalities of Latvia (HESPI, 2016).

Research results and discussion

According to e-mail survey undertaken in 2016 the municipalities in Latvia are more frequently using indirect forms of aid. Among 75 municipalities that responded to the questionnaire, most had aided business development with their procurements (60), and with local regulation (46). Some forms of general support, such as education and marketing activities for entrepreneurs were also used but not to such great extent. Very few municipalities were involved into public-private partnership or concession contracts since there are some legal complexities associated with these forms of support.



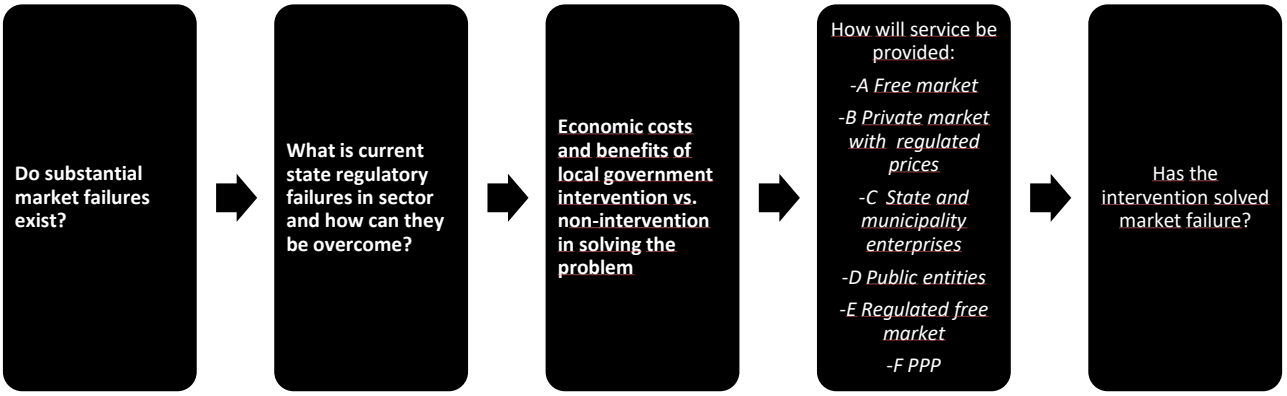
Source: based on: survey performed by authors, 2016

Fig. 2. **Basic Forms of Entrepreneurship Support Regularly Used by Latvian municipalities (%)**

When asked if local municipalities should in principle give preference to the local entrepreneur even it is more expensive, the answers were ambiguous 67% of the responding local governments answered affirmatively, among them most centers of national significance. The rest disagreed. 50% of respondents indicated that parallel operation of local governments and the market in providing identical products reduced the motivation of innovative and capable entrepreneurs to build their business.

43% of surveyed respondents agreed that municipalities may offer products and services on the market at a cheaper price than existing private suppliers, and about a half of respondents (51%) indicated that the municipality offered a service or a product that was already available on the market but took on some of the risks in order to ensure the stability and sustainability of the service. There were no significant differences in responses of national development centers and other municipalities, although the representatives from national development centers tended to agree more with this

statement. A half (50%) of respondents agreed to the statement that parallel provision of the identical product by the municipality and the market decreases the motivation of entrepreneurs to establish their business. Another ambiguity among municipalities was reveled in their answers to the statement about whether local governments should provide preferences to local entrepreneurs even if they offered service which was more expensive. Here again about a half agreed and the other half disagreed. To summarize, the results of the survey show that there is no consensus among the municipalities about their role in economic interventions, therefore some sort of formalized scenario to aid economic decisions is needed.



Source: author's construction based on HESPI (2016).

Fig. 3. **Basic Steps in Diagnosing and Acting Upon the Market Failure**

Proposed scenario for diagnosing the market failures in local governments consists of five steps:

1. The first step is the determination whether the particular market has *significant market failures*.
2. In the second step *market failures are examined deeper* by clarifying what are the c*urrent market and regulatory gaps* within the sector and how local governments can prevent them.
3. The third step is the *evaluation of costs and benefits* for chosen local government activities.
4. The fourth step is the selection of *intervention alternatives*. In case of no intervention the solution will be left to free market (a) The service and can also be left to free market while setting regulated prices (b). Furthermore, the service provision can also be taken up by state or municipality enterprises (c) or public entities (d) In addition, there is an options for regulating the market (e) and the use of public-private partnership mechanisms (PPP) (f).
5. In last step the *effects of the intervention* are assessed. Figure 1 and Table 2 outlines and details each step by presenting the key questions for analysis as well as methodologies.

Table 2

Questions and Methodology in Diagnosing and Acting Upon Market Failure

	Step	Key question	Suggested Methodology
1.	Diagnosing market failure	*Do substantial market failures exist?*	Assessment market sector competitiveness • Analysis of financial reports Assessment of the properties of product or service Assessment of positive and negative impacts on society
2.	Clarification of the market failure	*What current market and/or regulatory failures in particular sector and how can these be overcome?*	Assessment of the possibilities of regulation via subsidies and taxes • Assessment of legal basis (mixed goods or external effects) Choosing appropriate form of product/service delivery • Comparison of product/service production and delivery costs
3.	Weighting the costs and benefits of local government's intervention	*What are economic costs and benefits of selected kind of intervention vs. the costs of not intervening?*	Cost/benefit analysis
4.	Assessment of local government's intervention	*Has local government's intervention improved the situation?*	Control questions involving the analysis of market players, service price, customer complaints

Source: author's construction based on HESPI (2016).

During the initiation and evaluative stages of the intervention scenario there is a need to perform business and population surveys, as well as to analyse the local political and economic environment because the data obtained enables to perform comprehensive market analysis and provides the justification for the local governments to take an active participation in local economic development (FSA, 2006: 11).

Proposed scenario is generic and does not provide specific actions if particular local government development specifics is not considered. Therefore, we propose several control questions for frequent intervention areas. These areas are labour market, housing, and utility provision market. It is beyond the scope of this article to outline control questions for all of these areas. Therefore, a short-list of questions for the utility provision market are provided in Table 3.

Table 3

Control Questions for Assessing the Local Government's Intervention Utility Provision

1. Does the service provider's contracts are clearly stipulated in the dealings of the parties' rights and obligations?
2. Have local service providers in the market have increased the price of the services provided?
3. Has local debt for utilities substantially increased?
4. Have residents have complained about the lack of quality of service?
5. Do people have the opportunity to choose the service provider?
6. Do people have sufficient information on available local utility services in the municipality?

Source: author's construction based on HESPI (2016).

Each of local development approaches outlined before includes specific instruments that can help to correct the market failure. Labour market failures can be addressed by introducing full or partial subsidies, and by different forms of support for young entrepreneurs. Local governments can also support the purchase of assets or subsidized social entrepreneurship. Public-private partnerships are typical for the "Project state" whereas "Smart planning" government mainly use regulations, and "Development despite the state" opt for establishing the local government enterprise (see, Table 4).

Table 4

Local Government Actions Taken in Case of Market Failure

	Local government actions taken in case of …		
Economic development approach	**labour market failure**	**housing market failure**	**service market failure**
Smart Planning	Regulation Promotion activities Social entrepreneurship	Regulation Promotion activities	Regulation
Development State	No specific intervention	Supervision and administration Promotion activities	Supervision and administration Promotion activities
Development Despite the State	Supervision and administration Promotion activities Social entrepreneurship	Formation of local government enterprise Social entrepreneurship	Full or partial subsidies Formation of local government enterprise
Project State	Promotion activities External tenders Social entrepreneurship	External tenders Public-Private partnerships Promotion activities	Supervision and administration External tenders Social entrepreneurship Public-Private partnerships

Source: author's construction based on HESPI (2016).

Conclusions, Proposals, Recommendations

1. Market failure detection is inherently microeconomic analysis, which means proper identification of market economic principles and the understanding of the special characteristics of the local and regional market. In the same time, it is also a qualitative exercise about assessing local government's role and strategic orientation.
2. The detection of market failure should take into account different types of markets in which local governments operate (labour market, housing market and quasi markets - services and utilities).
3. There are also several challenges to identifying the market failures. First, state and market failures are in practice often mixed and therefore it can be difficult to distinguish between the roles that should be taken by national and local government in order to correct the market failure. Secondly, the detection of the market failure can also be relative to the spatial scale of analysis. Local market analysis can show that there are no alternative service providers in a single municipality, but regional market analysis undertaken on larger scale can uncover opportunities to attracting service providers from neighbouring municipalities, thus eliminating the need for market intervention.
4. Future analysis of local government market intervention should therefore take into account uncertain distinction between the state and market failures. It should also take into the account the dimension of the scale of the market analysis. It is important to emphasize, that strategic economic development orientation of the local government does matter in predicting local government approaches and instruments that are used in local economic development.
5. Ambiguous responses of local governments to statements about market intervention suggest that there is no consensus on what role should local governments play in providing goods and services that can in principle be provided by the private sector. Therefore, the methodology for determining market intervention is needed. This study takes the first step in designing such a methodology, but more research in empirical aspects of local market operations is needed.
6. Before intervening local government should make a thorough economic appraisal of the intervention backed up by a technical feasibility study covering all aspects of the operation, and the economic appraisal which then can be weighted against the social appraisal. The application of such methodology would make market interventions more transparent and contribute to solid reputation of local business environment.

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APPLICATION OF VIRTUAL AGENTS FOR DELIVERY OF INFORMATION SERVICES

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Abstract. In this paper, we analyse the application of virtual agents for providing information services in both the public sector and the business environment. We describe the motivation of our research by outlining the major technological, economic and social factors that are driving the adoption of the virtual agent paradigm. Our research is focused on studying the application of virtual agents based computer-user interaction in several representative use cases, and analysing user perception and preferences in communication with virtual agents. The results of the user perception and preference analysis presented are based on several surveys in various use case scenarios. Our study shows that a virtual agent provides an attractive alternative to the traditional online interface. We also identified that business organizations are interested to further expand their use as an efficient channel for cross product sales and brand loyalty-building through post-sales engagement interactions.

Key words: *bots, information services, intelligent virtual agents*

JEL code: O30, I20

Introduction

In recent years, we have witnessed the rapid proliferation of virtual agents and natural language conversational interfaces, such as, *Apple Siri*[1], *Microsoft Cortana*[2], and *Google Assistant*[3]. These universal virtual agents assist in making calls, sending messages, playing music, managing appointments, making notes, reminding, providing directions, etc. They are also capable of answering factual questions and holding a social conversation on an arbitrary topic.

In a broader sense, a virtual agent (VA) is a software character that can communicate with users in a natural language, answer questions, provide information, perform certain tasks or provide services. Virtual agents range from chatbots in online messaging platforms to computer generated characters with realistic animated embodiment, emotional expressions, and speech interface.

Intelligent virtual agents (IVAs), that are characterized by communication through a natural language and are equipped with a knowledge base for a specific domain, are used for diverse tasks in various domains – banking, energy, health, insurance, transport, and others. Intelligent virtual agents are already in demand in the digital market. In 2015, the IVA market size was USD 750.0 million[4]. Analysing the Intelligent Virtual Assistant Market and Segment Forecasts to 2024, Grand View Research states that the Intelligent Virtual Assistant market is expected to witness a substantial growth over the forecast period, with customer service applications dominating the industry (Grand View Research, 2016).

[1] https://www.apple.com/ios/siri/
[2] https://www.microsoft.com/en/mobile/experiences/cortana/
[3] https://assistant.google.com/
[4] http://www.grandviewresearch.com/industry-analysis/intelligent-virtual-assistant-industry

The widely successful virtual agents like Apple Siri, Microsoft Cortana and IBM Watson have triggered high expectations in both media and general public. Expectations are still growing and have not yet reached the inflation peak (Gartner, 2016a). According to Gartner (Gartner, 2013; Gartner, 2016b) the smart and intelligent machine era will blossom and it will be "the most disruptive in the history of IT".

Five years ago, 3D chatbot and assistant applications were growing in popularity. Today, as social platform technologies and innovations in artificial intelligence are still developing, the new era of social bots is arising. The "Chatbot as an application" and the "Bot in social platforms" have different approaches to dialog structure, modalities, information sharing, specific task fulfilment and problem solving.

Before the new bot technologies, 3D chatbots and assistants were developed as downloadable applications, and included visual elements, animations, speech recognition and many other modalities. Starting from 2016, the new and innovative approach to chatting with bots and virtual assistants in social media platforms like Facebook, Skype or Twitter is "conversation as a platform" (Microsoft, 2016) . Microsoft`s Skype sees the future of conversations (Skype, 2016) as Skype video bots, including visual elements and 3D animations.

Social platforms are becoming a vital tool used for businesses in client service and customer relationship management, as bots are always available and can provide an answer the moment the client asks. According to Facebook`s CEO Mark Zuckerberg: "I do not know anyone who likes calling businesses. It is not fast or convenient and it definitely does not feel like the future. [..] We think you should message a business just the way you would message a friend." (Zuckerberg, 2016).

In this paper, we share our findings on the role of conversational interfaces and analyse the application of virtual agents for providing information services in both the public sector and the business environment. We describe the motivation of our research by outlining the major technologic, economic and social factors that are driving the adoption of the virtual agent paradigm.

Our research is focused on studying virtual agent based human-computer interaction in several representative use cases. We have also performed an analysis of user perception and preferences in communication with virtual agents. The following chapters present several use case scenarios for different businesses:

- As a representative use case for customer service, we investigate customer relationship management at an airline.
- To explore the potential of virtual agents for information rich public services, we have created a pilot application for the public libraries of Latvia. In this example, we show how virtual agents enrich the client experience and increase the value of digital public data by augmenting human assistants rather that substituting them.
- In the utilization of virtual agents in education we investigate an example of a language teaching bot – a text based virtual agent integrated in major online messaging platforms.

Conversational Agents

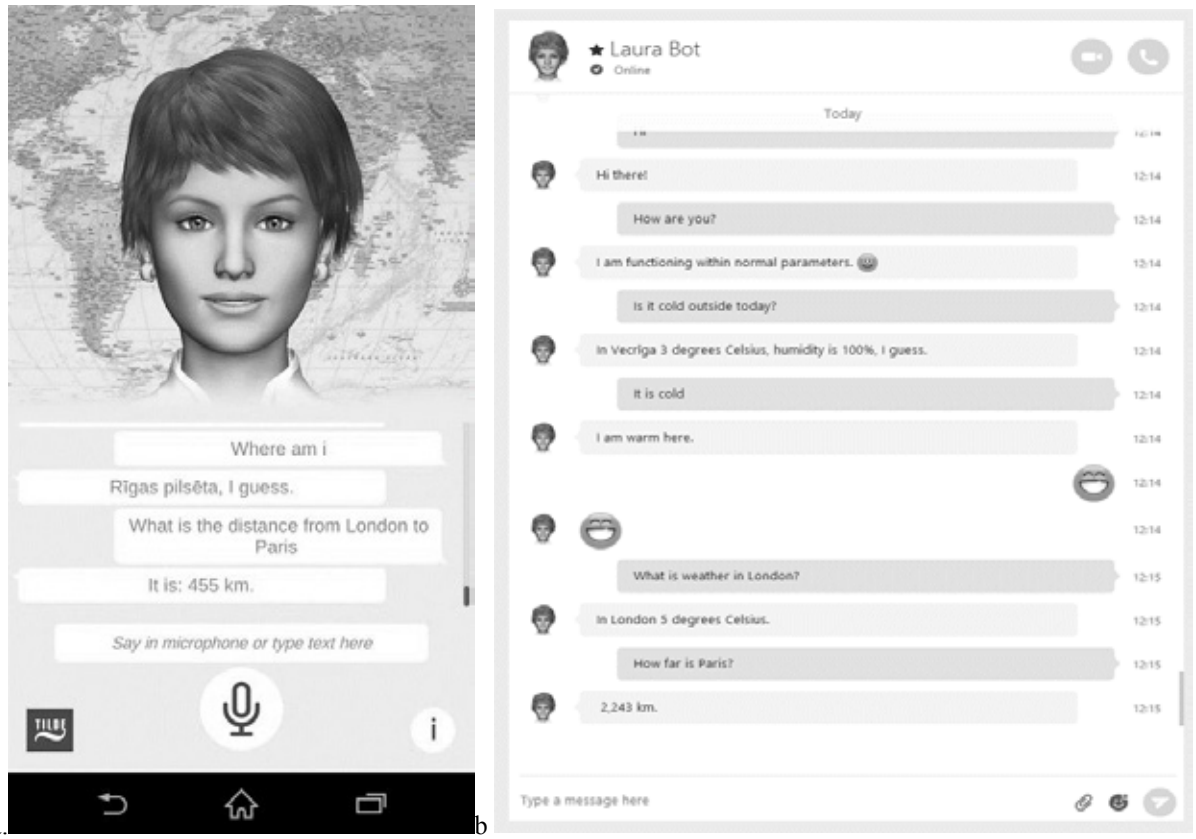
Simulation of the human ability to hold a conversation is one of the most popular applications of virtual agents. It was inspired by Alan Turing who proposed that human-like conversation is the test to assess a computer's ability to behave intelligently (Turing, 1950). Simulation was later further spurred by the surprising success of the first conversational agent Eliza developed by Joseph Weizenbaum (Weizenbaum, 1966).

In this study we analyse the usage habits and user preferences of the conversational agent Laura developed by our company(Fig. 1). Laura is a 3D virtual character that communicates in a natural language, understands simple questions and can chat on different topics in English (Vīra & Vasiljevs, 2014). This 3D virtual agent responds with facial expressions

and emotions. This application is designed as a modular system. In addition to the virtual agent web service that is responsible for intelligent conversation between the agent and the user, it integrates modular services for speech recognition and speech synthesis, as well as services to handle specific tasks such as enabling translation of user queries from one language into another (handling requests like “Laura, please, translate ‘Good evening’ into Latvian”).

The knowledge base and dialogue management is based on AIML technology (Artificial Intelligence Mark-up Language; Marietto et al., 2013) and covers a wide range of topics. A distinctive feature of the Laura conversational agent is its emotional awareness. It uses facial expressions as well as emoticons and emotion words to provide a contextualized emotional response during a conversation.

Laura was initially released as a mobile app for Android, iOS and Windows Phone platforms (Fig. 1a). In the 4 years since it was introduced more than 315 000 users have downloaded and tried the Laura application. User ratings show a strong and emotionally polarized reaction in the form of either attraction or repulsion. Out of 2875 user ratings on Google Play, 75% are either 5 or 1 star ratings in almost equal proportions (36% and 39% respectively), and just 25% are 4 (8%), 3 (10%) or 2 (7%) stars. Written reviews are also polarized, ranging from superlatives like “I truly really like her”, “understands human emotions and problems”, “answers my questions brilliantly”, to “I think she is horrible”, “Wasn’t comfy using it. Gave a feeling of creepy or rude.”, “She is hard to understand and ignores me some times”. It should be noted that the number of reviews with 1 star rating point to technical issues related to the speech interface which are likely caused by microphone problems.



a. b

Fig. 1. **Conversational agent Laura: (a) as an application; (b) as a chat partner**

To analyse user perception of communication modalities we conducted a survey of 23 users. Participants in the survey were asked to evaluate different communication channels and modalities - (1) 3D character, speech and text; (2) speech and text; (3) text only. The survey results (see Fig. 2) clearly indicate a strong preference for multimodal dialogue - 70%

of the respondents preferred communication with the 3D character using a voice interface. 17% favoured communication using voice and keyboard and only 13% preferred communication in text mode (Vīra et al., 2014).

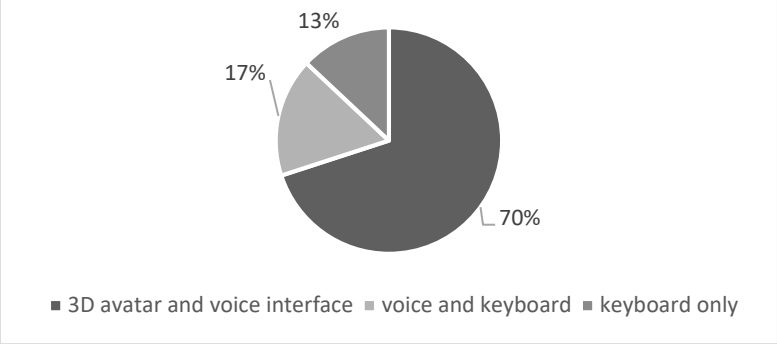


Fig. 2. **User preferences for interaction modality**

The most popular words or phrases used while chatting with Laura in a one-year period and chatting frequency are shown in Fig. 3. This suggests that the manner of communication with a conversational agent for many people is similar to the conversation between humans. Users try to be polite (*please, sorry*), speak about personal issues (dominance of *love, know, like, friend*).

The number of unique users chatting with Laura in not similar for each month. There is an increase in the number of users at the end of the year. This can be explained by an increase of free time during the holiday season and the need to escape loneliness and to communicate with friends, even with a virtual friend.

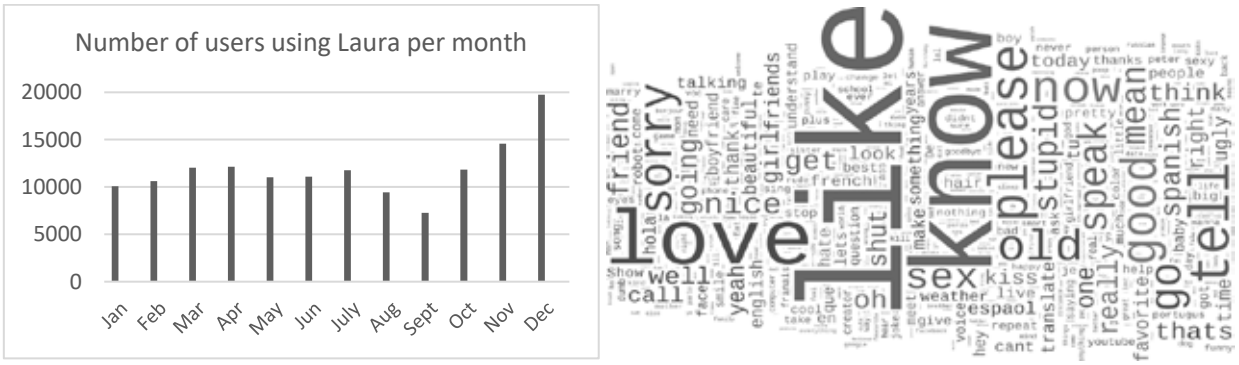


Fig. 3. **Usage frequency and most popular words used in conversation with Laura in 2016**

We notice that users often perceive the conversational agent Laura as a member of society and discuss current events with her. For example, we identified a tendency to discuss US presidential candidates during the election period in 2016 with a rapid peak right before and after the elections (see Fig. 4).

To introduce Laura in social media, it was recently integrated on Skype (Fig. 1b) and Facebook messaging platforms. Although the number of social media users communicating with Laura is growing, the 3D application is still much more popular. This may confirm the study results that users prefer communication with an animated character, but this can also be attributed to the shorter period since introduction.

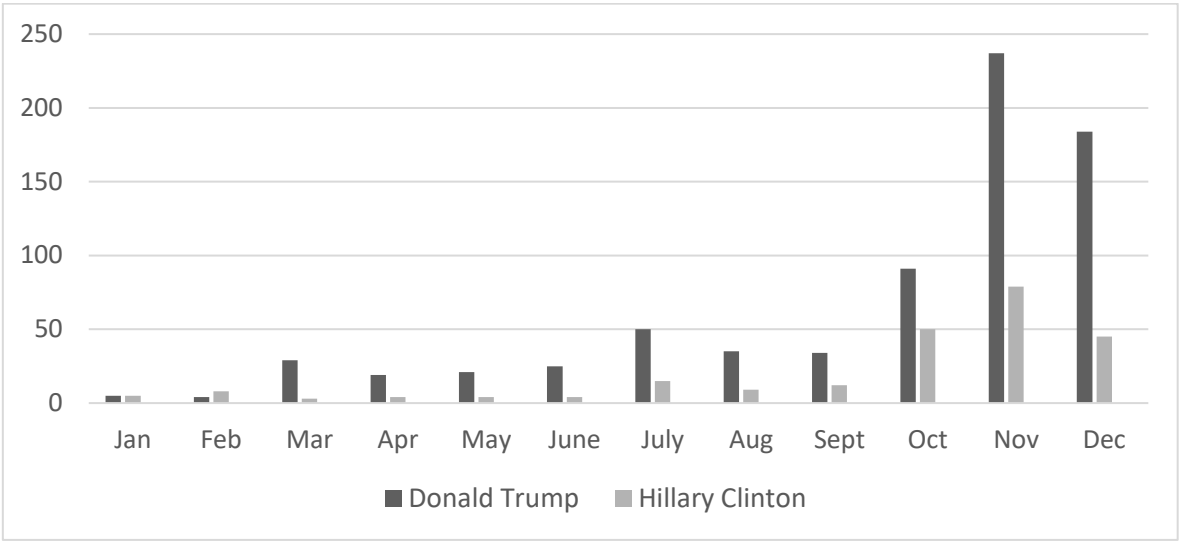


Fig. 4. **Number of user utterances mentioning Trump or Clinton grouped by month**

Virtual Agents for Education

A promising area of use for virtual agents is education and professional training. Traditional educational applications have an important limitation compared to human-to-human education. They are not able to provide an important component for learning – a two-way teacher-learner communication. The virtual assistant technology has the potential to overcome this limitation. A virtual teacher can enable a communication and interaction based learning process and add an emotional element to further boost learner engagement and motivation.

In this paper, the use of virtual agents for education is studied in two use cases:

- virtual agent for teaching basic arithmetic operations;
- virtual agent for teaching a foreign language.

Virtual agent for training the basic arithmetic operations

The virtual agent for teaching basic arithmetic operations is the first Latvian speaking 3D virtual character for the education sector (Fig. 5). Similarly to the conversational agent Laura, communication with this teaching VA includes different modalities – a 3D character and animations, a speech interface, and texting.

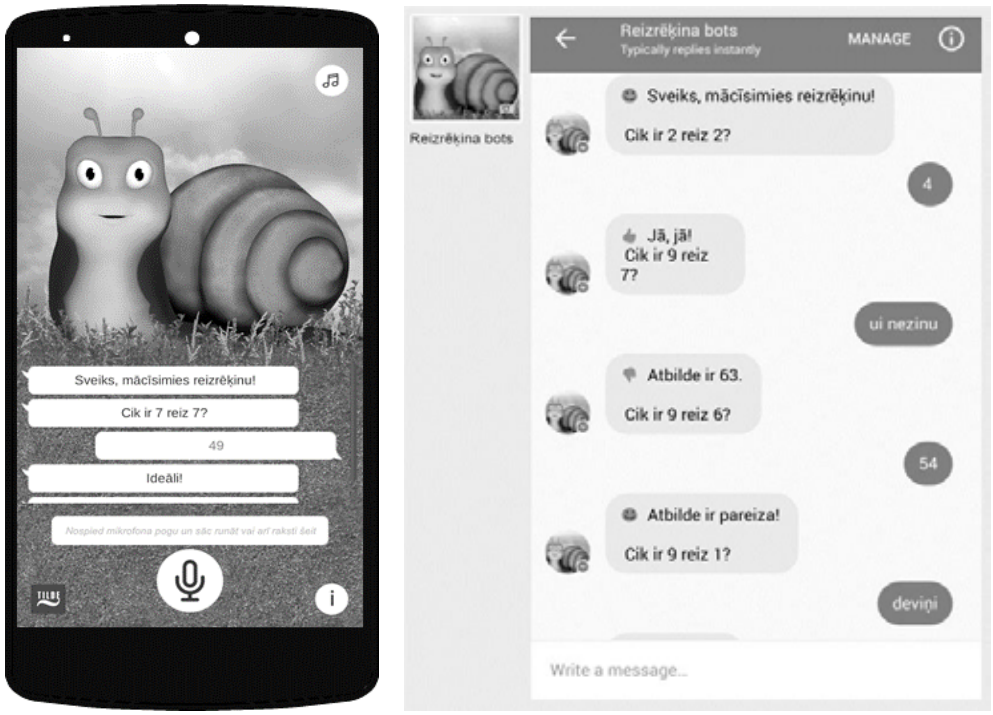


Fig. 5. **Virtual agent for teaching basic arithmetic: (1) application; (2) in messaging platform**

As this is the first application with speech interface in Latvian, the quality and appropriateness of speech recognition was investigated before the application was released. We wanted to determine whether the quality of speech recognition satisfies the needs of the application. Our main concern was the ability to recognize children's speech , as this application is mainly designed for children. 21 respondents – 10 children and 11 adults – were asked to use the application and answer 10 random multiplication questions using voice. In 69% of the cases the utterances were recognized correctly (78,26% adults, 57% kids), in 22% cases the speech recognition was partially correct (17,39% adults, 28% kids), while only in 9% cases the speech recognition was incorrect (4,35% adults, 15% kids). The results are presented in Fig. 6.

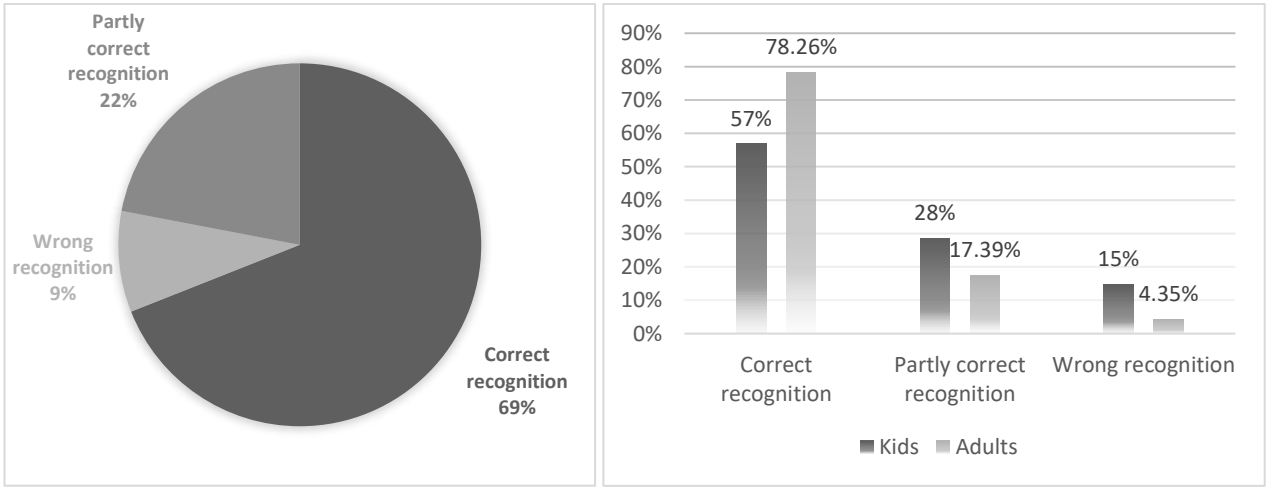


Fig. 6. **Role of speech interface for Reizrēķins application**

User ratings on Google Play are mostly positive with 74% of reviews having a 5 star rating (29 out of 39).

Similarly to the conversational agent Laura, we wanted to follow the social media trend and adapted this application for the social platforms Facebook and Skype. The challenge was to deal with the limitations of these platforms as they currently do not provide speech/voice modalities or support 3D animations. We organized a conversation with the bot through a chat without a menu driven dialog, allowing the user to solve multiplication problems only in writing. Our user

study shows that children prefer an application with a rich interface and are not interested in a simple chat to learn multiplication.

Virtual agent for foreign language acquisition

Foreign language learning solutions are among the most demanded education software. Learning language skills is particularly relevant for smaller linguistic communities. While for English, which is the world's most learned foreign language and the language of international business, a variety of solutions for language learning are continually being improved (including e-courses and training programs for corporations in various industries); there are very limited or no solutions for many less spoken languages. Not only small markets but also language specifics and complexities prevent adaptation of English learning solutions to these languages.

To assess the potential of virtual agent technology for language learning we created a chatbot for acquiring basic Lithuanian language skills (Fig. 7). The personality that we gave to this virtual agent is a friendly bear named Teo. The virtual agent for foreign language acquisition was designed from the beginning for communication in the popular messaging platforms taking into account both their features and limitations. In dialogue design, we extensively used the interactivity and visualisation features provided by these platforms. The learning process is organized as a controlled dialogue – the user has to choose between the offered options or type in the answers to the questions. The language acquisition process includes different gamification elements - learning levels, learning progress, scores assigned for the correct answers, emoticons displayed in VA responses. The teaching is organized around levels – starting from simple and moving to more complicated words and phrases. Each level includes several topics, such as food, phrases of politeness, signs, weather, days of the week and months, numbers, etc. During the learning process Teo motivates and inspires the user with encouragements and emoticons.

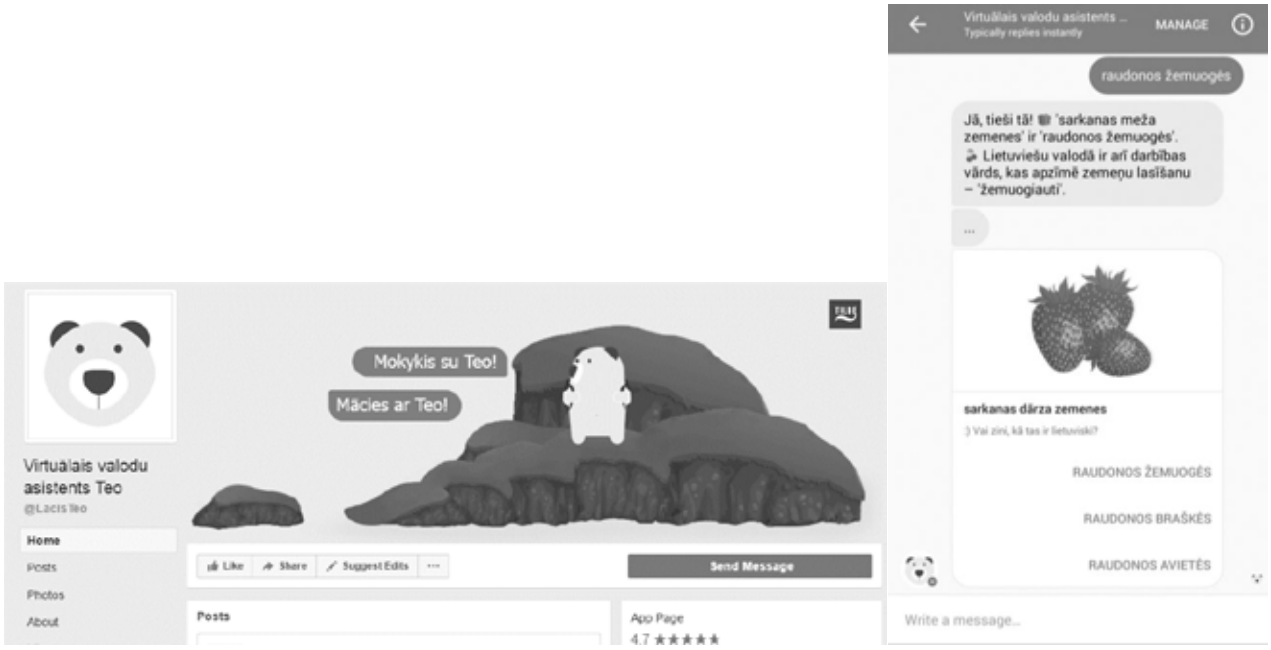


Fig. 7. **Virtual agent for language teaching**

In the two-week period of our study, 849 users were chatting with the bear Teo on Facebook and Skype. Most of the users (672) answered some questions from the first level, but did not continue. 90 users completed the first level and stopped at the second level. Seven users completed the first two levels and stopped at the third level. The same number of users stopped at the fourth level. 13 users reached the fifth level. 61 users did start a free chat, but did not engage in learning activities. Fig. 8 presents the overall Facebook data on Teo users regarding their gender and age.

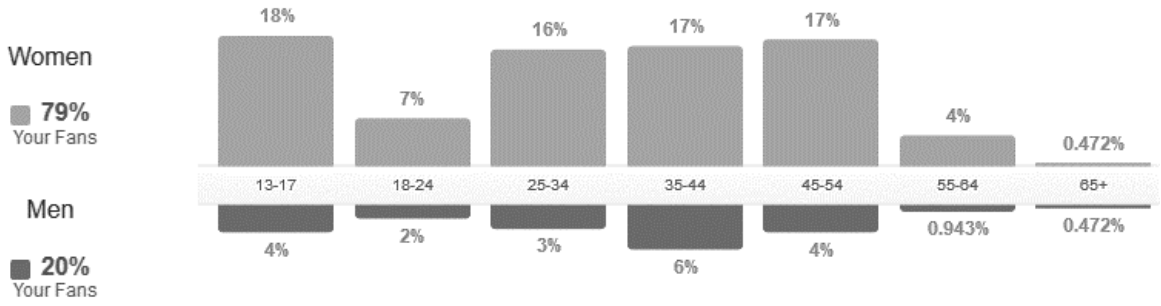


Fig. 8. **Distribution of users by gender and age**

To analyse personalization options for the foreign language teaching bot (see Fig. 9), we carried out a user survey. A specialized bot model was created in the Skype environment, which allowed selection between serious or playful dialogue. 25 respondents participated in the evaluation - 13 female and 12 male, 32% in the 31-40 age group and 24% in the 19-25 age group. Most of the respondents preferred the informal dialogue (84%) while chatting and learning with a bot. Respondents agree (96%) that usage of emoticons and a positive attitude is a valuable feature in human - computer interaction. In addition, users agree with a statement that personalization plays a significant role in human-computer interaction. Recommendations from users included dialogue style adaptation for different age groups and the possibility for a bot „to learn" a conversation style and nuances for speaking with each of its users.

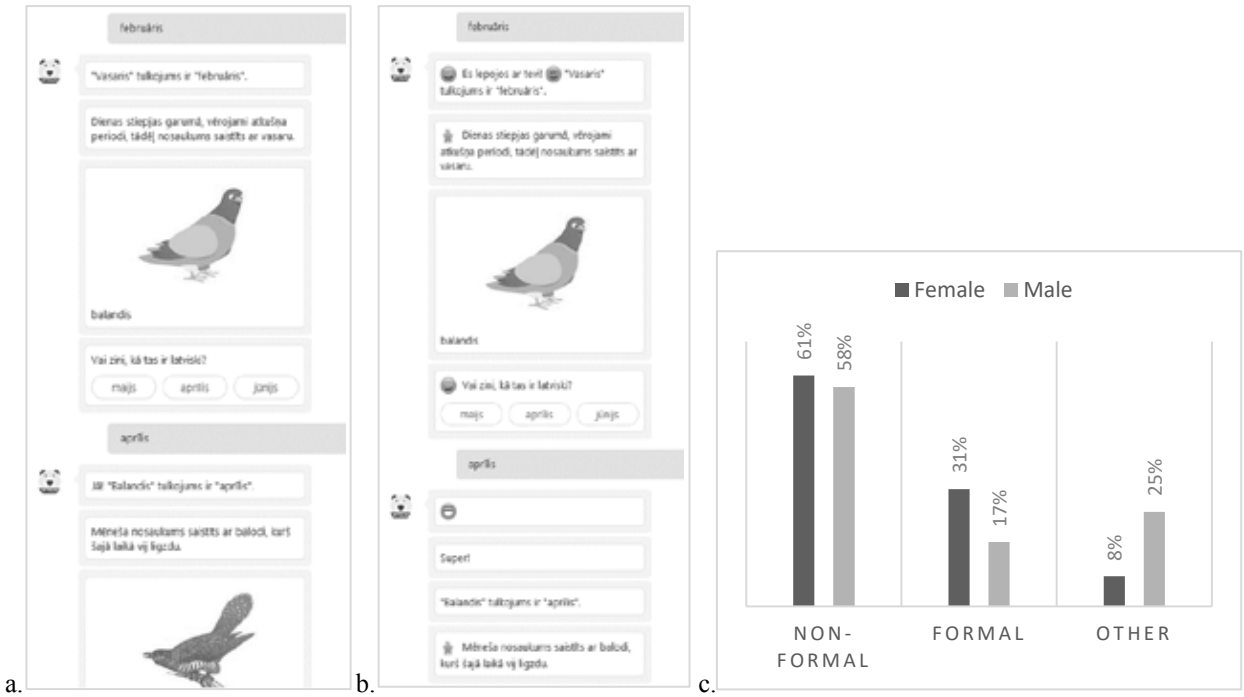


Fig. 9. **Sample of formal (a) and informal (b) dialogue; results of the survey (c)**

Virtual Agents for Customer Service

The bots in customer service are used to automate typical user interactions for support and information. For example, WDS Virtual Agent[5], using artificial intelligence from the Xerox research labs, can understand, diagnose, and solve customer problems, while "Amelia is a cognitive agent that can take on a wide variety of service desk roles"[6]. In our

[5] https://www.news.conduent.com/file?fid=5851b023a13835482f767950
[6] http://www.ipsoft.com/amelia/

study, two different use scenarios of customer services have been implemented: (1) a virtual travel agent and (2) a virtual agent for a customer call centre.

As a representative use case for customer service, we investigated virtual travel agent. Before implementation, different reservation options, payment features, booking a flight or hotel, component adaptation to a social bot performance and requirements were analysed. Based on this analysis we selected several typical use cases and implemented them as a Skype prototype of the Virtual Travel agent (Fig. 10).

The Virtual Travel agent can provide information about flight arrivals and departures and flight updates, help book tickets and manage the user's profile. The dialogue is organized both based on selection from a menu and as a free chat. Users can ask questions related to traveling, for instance, "What can I take in my hand luggage?", "Is an umbrella allowed?" or "What time is my flight?" or communicate via button-organized dialog.

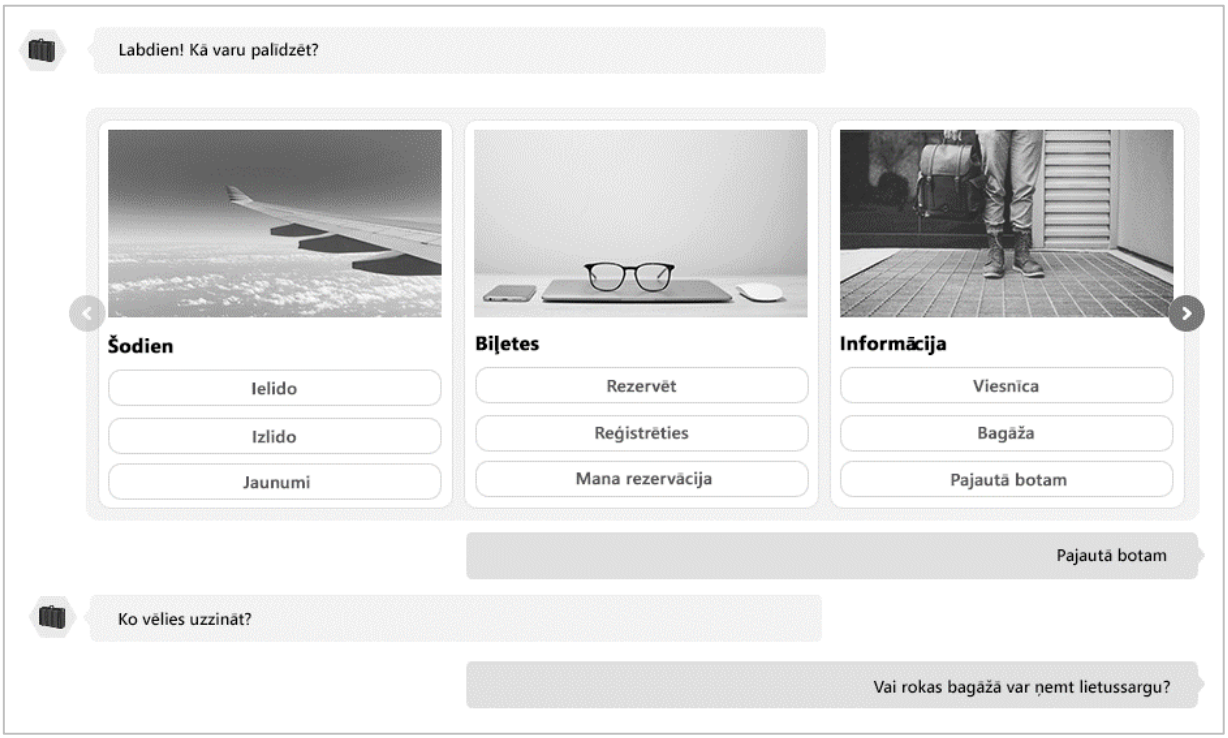


Fig. 10. **Virtual Travel bot**

Another use case for customer service addresses the urgent need to decrease customer call centre workloads and improve communication with clients (Fig. 11). Introducing a customer service bot provides benefits not only for clients, but also for employees and the organization. Client benefits include quick information acquisition on the go, 24/7 availability, un-synchronous conversation - the chat with the bot can be continued at any time. Bots can eliminate those frequent situations when a customer is asked "to stay on hold" waiting for a human operator. Only in cases when the bot is not able to provide an answer, the communication with the customer can be switched to the human operator.

The main benefits for customer call centre operators is decreased workload and increased efficiency. They can follow bot-client conversations, acting when necessary or joining the clients' conversation with the bot if any "bottlenecks" or errors are noticed. Key business benefits provided by virtual agents are cost reduction on client support operations and new advertising and cross-sales opportunities. Bots can also be used as an instrument for market research, user retention and experience study through bot analytics systems.

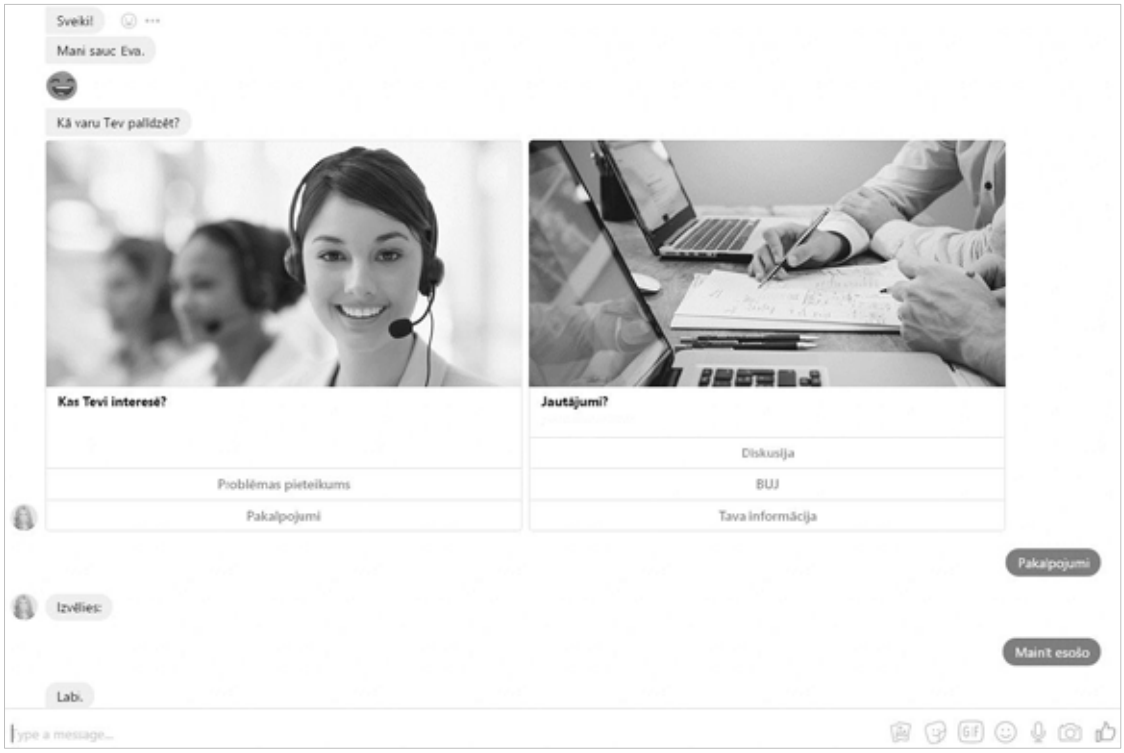


Fig. 11. **Virtual Agent for Customer Service**

Although our study of the bot application for customer service is still ongoing, preliminary findings show that the virtual agent is an attractive alternative to the traditional online interfaces. We already work with several business organisations to implement these technologies in their customer service operations. These businesses are interested not only in the efficiency increase but also in using bots as a new channel for cross product sales and brand loyalty-building through post-sales engagement interactions.

Virtual Agents for Information Rich Public Services

To explore the potential of virtual agents for information rich public services, we created a pilot application for the public libraries of Latvia (Fig. 12). By this example, we show how virtual agents enrich the client experience and facilitate the work of digital public data enhancing human service rather than substituting for it.

The Virtual Librarian is a virtual agent that provides users to access information in library catalogues and digital data collections from their preferred social platform using a natural language interface. The key functionality of the Virtual Librarian includes a search (by title or author, by genre, for new additions to library), personalization (a personalized list of books, preferred libraries, recommended reading) and assistance (the questions and answers in a natural language; can involve a human librarian).

The virtual agent communicates in a natural language; the conversation is enriched with images, links and other supporting information. The Virtual Librarian can answer questions such as, “Where is the library located?”, “How can I become a subscriber?” or “What time is the library open today?”. The Virtual Librarian supports the creation of a personalized list of the user’s preferred books, informs the user about recent updates, and offers the user recommendations based on preferred libraries or genres. In addition, it supports conversation in a natural language with the possibility to engage a human librarian, if necessary.

a. b.

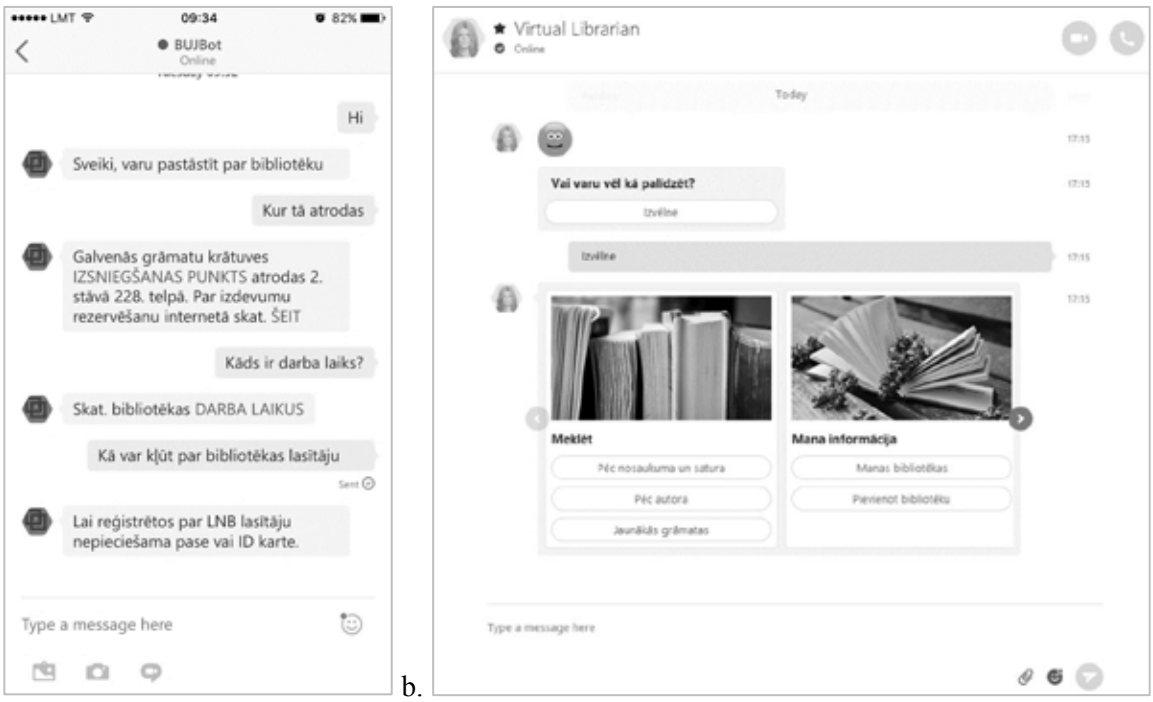


Fig. 12. **Virtual Librarian in action: (a) natural language question answering; (b) – menu-based interaction**

Conclusion

In this paper, we analysed virtual agents and conversational bots for providing information services in both the public sector and the business environment. Social platforms are becoming a significant tool used not only for entertainment, but also for businesses. The new bot user experience differs from previous generation chatbot technologies and is still in development and mostly driven by the supply. Customer care, awareness generation and usage of new technologies is where businesses can really utilize Facebook Messenger (Newlands, 2017). The bots can help achieve a company's goals, enrich the client`s experience, and increase the value of digital data enhancing human services rather than substituting for them. As a new bot approach differs regarding dialog structure and menus, modalities, information sharing, specific task fulfilment and problem solving, the main challenge is how to deliver information and data for the needs of customers and businesses. In addition, personalization plays a vital role in bot communication, dialog style and conversation type, and "attitude" is no less important. Use cases introduced in this paper present our experience in building bots and virtual assistants and users` perception of this technology. Our findings conform to the conclusions drawn by Shawar and Atwell (2007) that "the aim of chatbot designers should be: to build tools that help people, facilitate their work, and their interaction with computers using natural language; but not to replace the human role totally, or imitate human conversation perfectly."

Acknowledgements

The research leading to these results has received funding from the research project "Competence Centre of Information and Communication Technologies" of EU Structural funds, contract No. 1.2.1.1/16/A/007 signed between IT Competence Centre and Central Finance and Contracting Agency, Research No. 2.4 "Multi-modal human-computer interaction in multilingual environment".

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GOA-WORKBENCH® SOFTWARE - EXCELLENCE SUPPORT TOOL FOR ENTERPRISES

Andzela Veselova, University of Latvia, Latvia

Abstract. In the 21st century, the quality management procedures aim to reach sustainable growth and outstanding results through the principles of excellence and continuous improvement.

Excellence, sustainability and future success of the company base on EFQM (European Foundation for Quality Management) Excellence model as a philosophical background combined with organizational self-assessment and striving for continuous improvement.

GOA - Solution methodology has become a part of the business thinking. However, in the strategic management its role of strategic resource remains virtually unexamined. The GOA - Solutions methodology can help to produce competitive advantages - improves behavioral features regarding the behavior of employees, competence improvement etc.

This paper aims to explore GOA - Solution methodology as a part of self-assessment tools and to find the most efficient ways of using it.

This paper consists of experts opinions of the role of GOA - Solution methodology in self-assessment and empirical research. In the empirical research, a survey among the enterprises of Latvia was conducted to determine the most effective GOA - Solution as self-assessment tool. Practical examples of GOA - Solution implementation as a part of self-assessment tools in the enterprises of different areas is also discussed.

The paper uncovers different ways of application of self-assessment tools and different effects of it on performance indicators of the companies. The enterprises do not need a lot of resources for successful operation, all they have to do is to choose the most appropriate self-assessment tool.

Keywords: *GOA-Solution software, EFQM , Business excellence*

Jel code: *L25, C31*.

Introduction

Leading European organizations have already been using the EFQM Excellence Model, one of three worldwide Total Quality Management instruments, for 25 years. In the 20th century, many organisations focused on auditing and quality assurance processes. Nowadays, the quality management procedures aim to reach sustainable growth and outstanding results through the principles of excellence, continuous improvement and learning. European leading organizations have been using EFQM Excellence Model, one of the three worldwide renowned Total Quality Management tools, for a quarter of century.

The GOA - Solutions methodology can help to produce competitive advantages - improves behavioral features regarding the behavior of employees, competence improvement, development of corporative culture etc.

The aim of the research is to explore the use of GOA-Solution methodology, to summarize the current experience of use of this tool and make proposals for the future. The tasks are the following of to provide a theoretical explanation

of excellence: to describe GOA-Solution software; to carry out a survey of user experience and to summarize the conclusions and proposals.

The methods applied in the research include descriptive analysis in order to determine the importance motivation and implementation of GOA - Solution methodology and experts survey.

The authors Hides M.T., Davies J. and Jackson S indicated that the EFQM Excellence Model could be as a philosophical background, when combined with organizational self-assessment and continuous improvement implementation, becomes the basis of an organization's excellence, sustainability, and future success. (Hides M.T., Davies J. and Jackson S., 2004).

The authors Kim D.Y., Kumar V. and Murphy S.A., indicated that to become strong and successful, an organization must find its "spirit of excellence," through which employees always strive to be better tomorrow than today .(Kim D.Y., Kumar V. and Murphy S.A., 2010) According to Dalluege C. A. opinion the EFQM Excellence Model helps to do this in a structured way by focusing directly on the most relevant areas rather than focusing on generic ideas about "ideal organizations".(Dalluege C.A., 2012)

GOA-Solutions, hereinafter referred to as GOA, is based on the Group Opinion Analyser, an extensive modular software solution for the creation, implementation and evaluation of any type of survey. In theory, GOA supports all survey- and assessment-supported management techniques that have been tied in to GOA through a corresponding "knowledge base". Since 1996, GOA is the only excellence support software internationally licensed by EFQM.

The authors Roca V., Escrig A.B., Bou J.C. and Beltrán I., considers that GOA saves time, personnel and financial resources; it minimises paperwork and provides professional support which has been recognised by many users across Europe. In addition to supporting the use of the EFQM Excellence Model, GOA also produces reports addressing CAF, ISO 29990, and Project Excellence. (Roca V., Escrig A.B., Bou J.C. and Beltrán I., 2006).

Experts from G4E points out that the software is regularly reviewed and updated to conform to the latest Excellence Model versions as well as customer expectations. (G4E Software Solutions.,2014) GOA - Solution methodology: (GOA-WorkBench - GOA-Solutions, 2014)

- GOA-Solution methodology has become a part of business thinking.
- The GOA-Solution helps to organize a web-based self-assessment, consolidate the results, prioritize ideas for improvement and transfer them into well-planned projects. Exchanging face-to-face meetings for telework means are more relaxed and less pressed for time which benefits everyone in the journey towards excellence.

Research Results and Discussion

Bentler P.M. considered , that used as a strategic evaluation tool, the EFQM Excellence Model provides a holistic view of the organization, highlighting strengths and opportunities to improve. Used as a benchmarking tool, the Model compares the organisation to its competitors and other leading organisations. (Bentler P.M.,2006). Used as a management tool, it helps to set performance and competency objectives for the organisation. There are many critical distinctions between enterprises which are "normal" and those which are considered "excellent" (see table 1).

Table 1

The main differences between "normal" and excellent enterprises

Average enterprises	Excellent enterprises
Lack of team spirit and motivation	Highly satisfied and motivated people
Average results and satisfaction level	Outstanding results and sustainable growth
Lack of clear vision and long-term goals	Integrated vision shared by everyone
High internal competition, low level of knowledge sharing and cooperation	Innovation, creativity, knowledge sharing and learning as a key success factor
Low cooperation and knowledge sharing between employees	High cooperation and knowledge sharing between employees
Inefficient use of resources	Effective planning and use of resources

Source: author's construction based on GOA-WorkBench - GOA-Solutions, 2014 ; Grigg N. and Mann R., 2008

The table indicates that "normal" enterprises are plagued by several weaknesses - lack of team motivation and unclear long-term goals, among others. Each of these weaknesses impact the performance indicators of an enterprise. In order to be excellent, organisations cannot focus their efforts on only one area. They must optimise the use and effectiveness of all resources within the organisation. Escrig A.B. and de Menezes L.M. considers that new opportunities, processes, tools and techniques emerge daily, supporting the development of an organisation: The Balanced Scorecard (BSC) provides a framework for monitoring KPIs; Goa-Solutions, ISO9001 secures a robust Quality Management System; ISO26000 provides guidance for Corporate Social Responsibility (CSR). (Escrig A.B. and de Menezes L.M., 2015). See EFQM model in Figure 1.

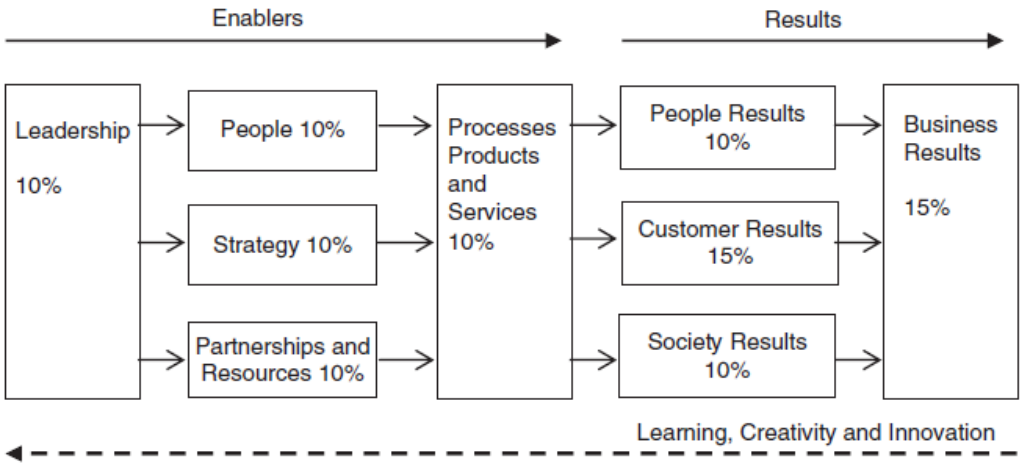


Fig.1 **EFQM model criteria**.

Source: European Organisation for Quality Foundation, 2013

The final version of the EFQM Model was adopted in 2012. All nine EFQM criteria are represented in the list of sub-criteria questions (see Table 2).

Table 2

EFQM subcriteria

Subcriteria	Characteristics
SUB 1a	Leaders develop the mission, vision, values and ethics and act as role models
SUB 1b	Leaders define, monitor, review and drive the improvement of the organization's management system and performance
SUB 1c	Leaders engage with external stakeholders
SUB 1d	Leaders reinforce a culture of excellence with the organization's people
SUB 1e	Leaders ensure that organization is flexible and manages change effectively
SUB 2a	Strategy is based on understanding the needs and expectations of both stakeholders and the external environment
SUB 2b	Strategy is based on understanding internal performance
SUB 2c	Strategy and supporting policies are developed, reviewed and updated
SUB 2d	Strategy and supporting policies are communicated, implemented and monitored
SUB 3a	SUB 3a People plans support the organization's strategy
SUB 3b	People's knowledge and capabilities are developed
SUB 3c	People are aligned, involved and empowered
SUB 3d	People communicate effectively throughout the organization
SUB 3e	People are rewarded, recognized and cared for
SUB 4a	Partners and suppliers are managed for sustainable benefit
SUB 4b	Finances are managed to secure sustained success
SUB 4c	Buildings, equipment, materials and natural resources are managed in a sustainable way
SUB 4d	Technology is managed to support the delivery of strategy
SUB 4e	Information and knowledge are managed to support effective decision making and to build the organization's capability
SUB 5a	Processes are designed and managed to optimize stakeholder value
SUB 5b	Products and Services are developed to create optimum value for customers
SUB 5c	Products and Services are effectively promoted and marketed
SUB 5d	Products and Services are produced, delivered and managed
SUB 5e	Customer relationships are managed and enhanced
SUB 6a	Analysis of customer's perceptions of the organization
SUB 6b	Analysis of performance indicators: internal measures used by the organization in order to monitor, understand, predict and improve performance of the organization's external customers
SUB 7a	Analysis of people's perceptions of the organization
SUB 7b	Analysis of performance indicators: internal measures used by the organization in order to monitor, understand, predict and improve the performance of the organization's people
SUB 8a	Analysis of society's perceptions of the organization
SUB 8b	Analysis of performance indicators: internal measures used by the organization in order to monitor, understand, predict and improve performance of the organization's relevant society stakeholders
SUB 9a	Key strategic outcomes: key financial and non-financial outcomes which demonstrate the success of the organization's deployment of their strategy
SUB 9b	Key performance indicators: key financial and non-financial indicators that are used to measure the organization's operational performance

Source: author's construction based on Escrig A.B. and de Menezes L.M.,2016

These sub-criteria are general, but they can be adapted according to the specific situation: educational enterprises, public sectors, healthcare, etc.

The authors Dalluege C.A., and Stucken A. offer 5 steps to implementing the GOA - Solution**:** **(**Dalluege C.A., Stucken A., 2012)

1 Decision to implement the Excellence approach.

EFQM experts regularly review and update the software content to fit the current needs of every organization. 21st-century leaders are reaching their goals through the efforts of team members as well as through shared continuous improvement activities. Companies whose leaders support the implementation of Excellence approaches in their organisation achieve outstanding results, sustainable company performance, and a competitive advantage against others. GOA-Solutions provides a complex methodology that integrates various levels of training, an Excellence tool, and optional coaching by internationally-experienced EFQM professionals. (Dahlgaard-Park S.M., 2008)

2 GOA-Solution training.

Training is provided in between the basic introduction and the operational Excellence implementation. Depending on the chosen GOA-Solutions package, various levels of training and coaching are applied. In general, the learning approach consists of a blended learning methodology with a mix of face-to-face training, electronic materials, and optional coaching provided by a local or international expert.

3 Self-assessment using the GOA-Solution.

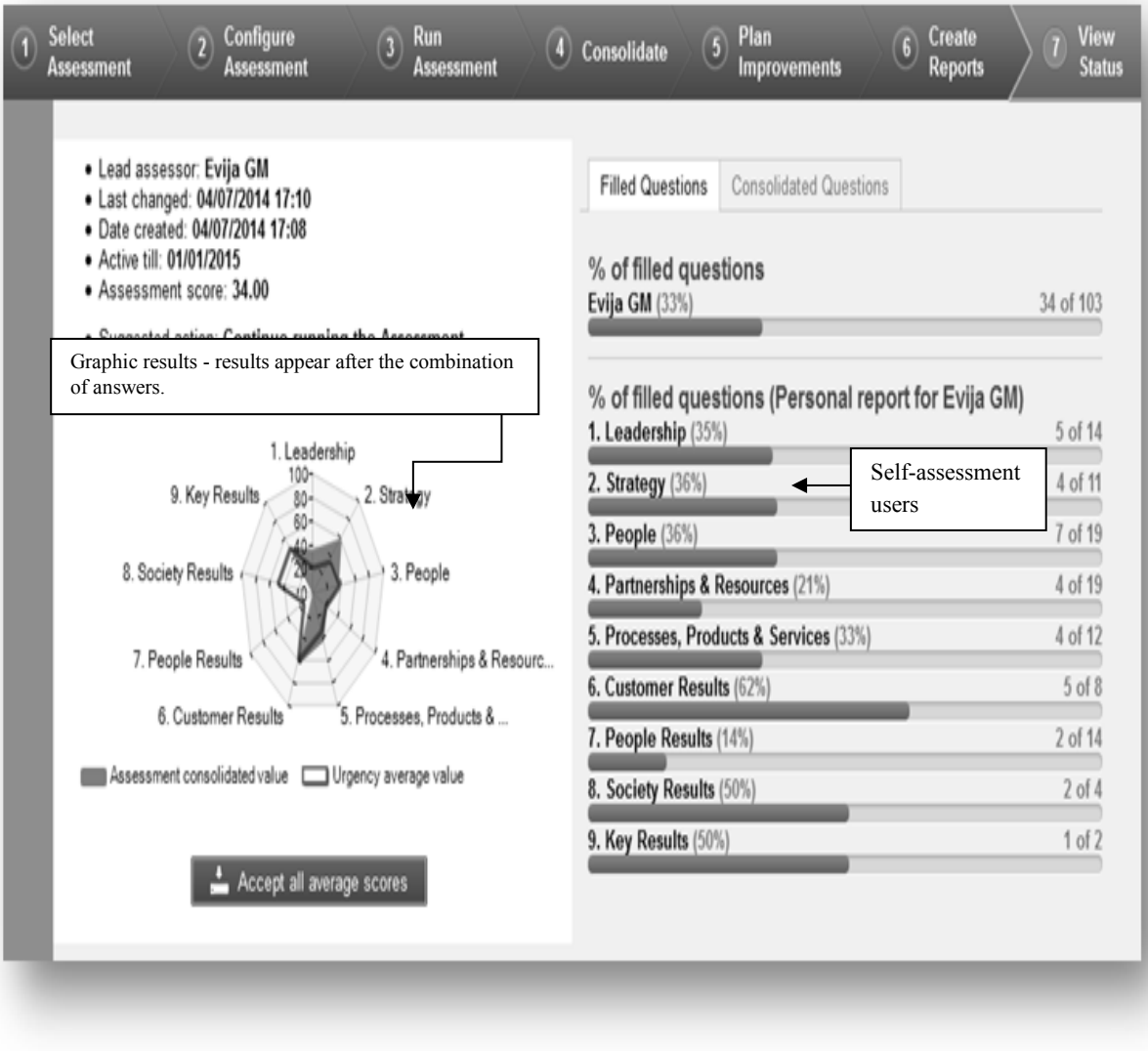
After completing training and demonstrating understanding of the basics of the Excellence Model and Self-Assessment process, a practical activity can be introduced. With GOA online software, the Self-Assessment tool can be applied to the organisation's assessment team and can be supported by an external expert (coaching).(G4E Software Solutions, 2011). Self-Assessment should be begin with an electronic invitation from the assessment team, followed by the delegation of responsibilities within the team. Many experts consider that at this phase of self-assessment, various surveys can also be applied and relevant stakeholders can be included. Self-Assessment as a process may begin with the assessment of current performance against the 9 criteria of the EFQM Excellence Model, which provides relevant evidence, sets urgency levels for improvement, and provides ideas for growth.

As previously mentioned, the principles of the GOA self-assessment module are based on the framework of the 9 criteria of the EFQM Excellence Model. (Leadership, Strategy, People, Partnerships and Resources, Processes, Products and Services, Customer Results, Employee Results, and Company Results)

Users considers that GOA is flexible and easy to customise to fulfil the expectations of each sector and client.

During the self-assessment, each user is navigated through a survey of approximately 100 questions. supported by two scales of explanation and assessment; the first scale gives evidence and scores the current situation, while the second scale assesses the urgency for improvement and offers ideas for development. (See Figure 2.)

Progress is automatically monitored throughout the process. Access to the self-assessment is available online to an unlimited amount of users. (See Figure 2.)



Source: Saeto-selfassesment for educational and training organization,2017

Fig.2. **GOA - Solution assessment**

4 Consolidation of results and planning of improvements.

After the self-assessment has been finalised by all members, the team leader or owner of each criterion can consolidate the answers and edit the descriptions of organisational strengths. The assessment team leader can then determine the final scores and level of urgency for improvement before deciding which suggestions are suitable for the future consolidation and development of improvement projects. Experts from Lenz consulting point out that GOA also provides functions which enable the creation of detailed reports from the collected and analysed data. Reports can be generated in both HTML or MS Word file formats. (Lenz consulting,2014).

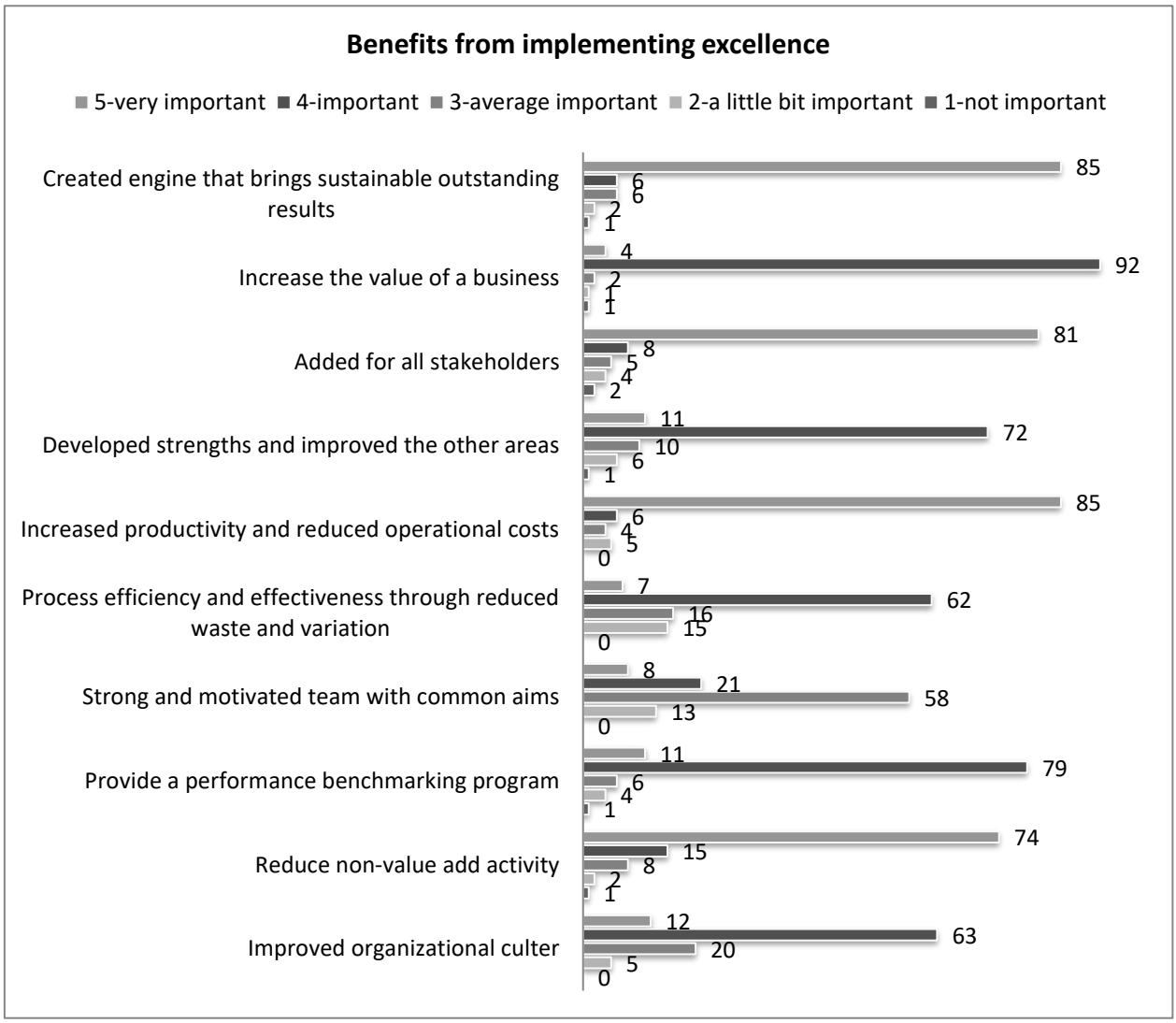
The authors Dalluege C. A. and Franz H.-W. considered that GOA-Solutions helps to manage improvement projects and define the specific indicators for each project regarding responsibility, costs, etc. The progress of the implementation of improvement projects can be easily monitored and updated. (Dalluege C. A., Franz H. W., 2011)

5 Implementations for continuous improvement.

Self-assessments should be conducted yearly to allow for the measurement of continued improvement. Kim D.Y., Kumar V. and Murphy S.A pointed out that this helps to identify drivers for continuous improvement and strengthen the organization, building up a culture of excellence. (Kim D.Y., Kumar V. and Murphy S.A., 2010).

Dalluege C.A. accentuated that the next level of self-assessment follows the same approach but also adds the first level of RADAR Logic from the EFQM Excellence Model; this requires a more detailed analysis for each questions. This level provides deeper insight but is also much more time-consuming and requires experienced users for implementation. Regular self-assessment not only brings internal results but also allows the organisation to apply for formal EFQM Recognition or participate in National or International Quality Awards. (Dalluege C.A., 2012)

The author carried out research with the help of 15 experts from Latvia. These experts represented different areas including education, pharmacy and the public sectors enterprises. Experts were from "Grindeks", " RTU", University of Latvia etc. Each had experience in using GOA-Solutions for between 3 and 5 years. The author desired to find out what kind of benefits result from the application of excellence. Assessment was determined on a scale where: 1 – not important, 5 – very important. The benefits from implementing excellence are shown in Figure 3.



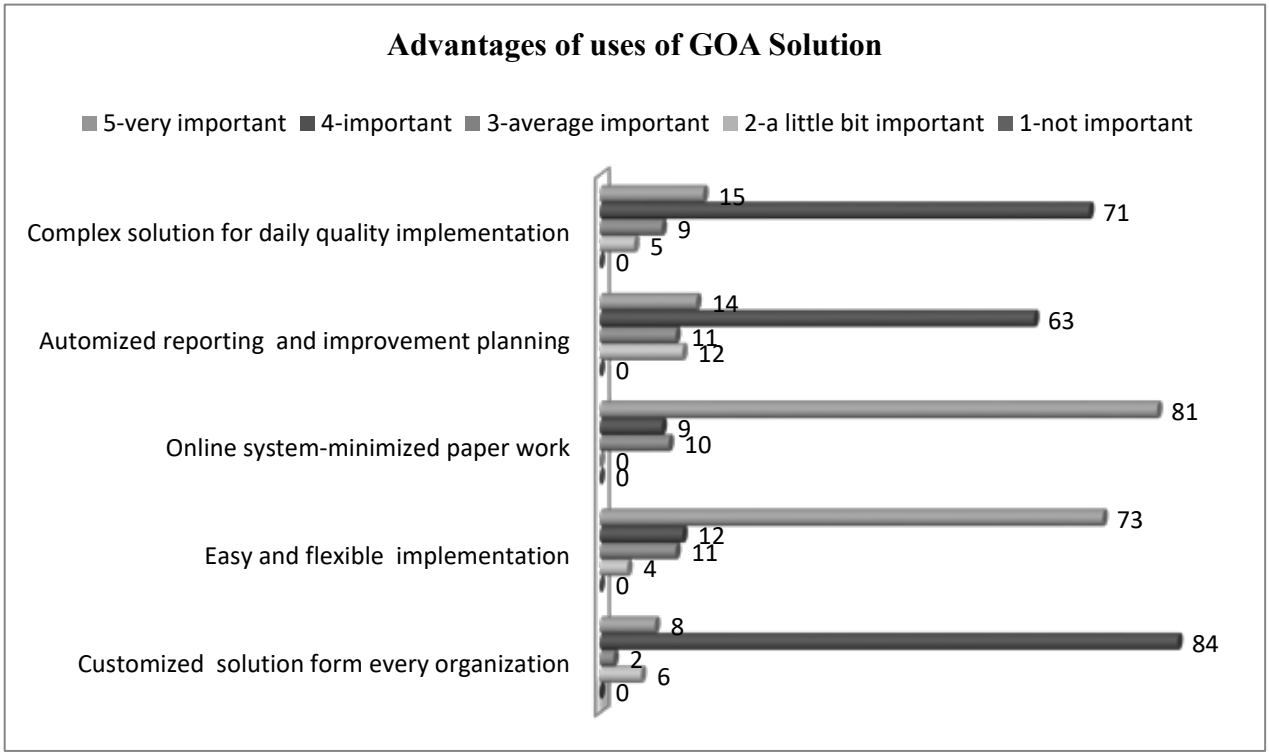
Source: author's calculations based on author's research,%

Fig. 3. **Benefits of excellence implementation**

Sharing their experience regarding the benefits of implementation of excellence, 85% or 13 of the questioned experts gave 5 of 5 for a benefit position „Created engine that brings sustainable outstanding results", which means, that they

agree that a company can work successfully only with unchanging, stable results within a defined period of time. Moreover, experts also rated 5 of 5 points to another important benefit, namely, '"increased productivity and reduced operational costs". It is what they face daily, and it means that compliance with a range of basic conditions of excellence, it is possible to reduce costs, for instance, in case of decrease of number of defective goods, recycling etc., which would, in their turn, increase the revenue. The results of the questionnaire show that 81% or 12 of the questioned experts highly evaluated (5 points of 5) "added value for all stakeholders" as important benefit of implementation of excellence. It indicates, that the experts, whose companies already operate according to defined principles of excellence are aware of taking into account the interests of customers and shareholders as well as the interests of employees, suppliers, cooperation partners, state and municipal authorities etc., since all the stakeholders are related to a certain type of success of the company. However, it is quite hard to take into account all the interests at the time, because each of the parties has its own wishes and needs, and they are different. 92% or almost 14 of experts gave 4 points of 5 to "Increase the value of a business" as an important benefit of implementation of excellence, because with excellence in operation the number of complaints decreases and the reliability and loyalty of customers increases, thus increasing the, both material and non-material value of the company. 79% or almost 12 of respondents gave 4 points of 5 to use of benchmarking or comparing in their work as important benefit, which allows assessing the strengths and weaknesses to be improved, thus following the best practice in the respective field and market in order to keep company's competitive advantages and be able to overtake the competitors.

The opinions of the experts on advantages for users of the GOA-Solution are reflected in fig. 4. Assessment scale: 1– not important, 5 very important.



Source: author's calculations based on author's research,%

Fig.4 **Advantages of use of the GOA-Solution**

The experts shared their experience, indicating benefits faced in their daily work, meanwhile using GOA solution tool for self-assessment. 81 % or 12 of the questioned experts in their answers emphasized "Online system-minimized paper work" as an important benefit, which means that the company can decrease the document resources by reducing the amounts of paper, thus saving the resources and use electronic self-assessment as environment tally friendly method. 73 % or 11 of experts gave 5 points of 5 to the descriptive position "Easy and flexible implementation" of GOA solution tool, which indicates, that the tool is adjustable to the needs of almost any company by small amendments depending on work specifics of the company.

Conclusions, Proposals, Recommendations

1. GOA-Solutions is a customised methodology developed by internationally-leading EFQM and Excellence experts. It is affordable for everyone, and any company can find their own approach to its implementation to obtain outstanding results in the future. Using GOA-WorkBench as a part of the solution can be the start of a comfortable and easy path to excellence with the only internationally-licensed EFQM tool.
2. GOA-Solutions is a complete solution for self-assessment, satisfaction surveys, and the selection, planning and management of improvement projects.
3. GOA-Solutions is modular and scalable according to the requirements of an organization and GOA-Solutions helps enterprises to organize web-based self-assessment, consolidate the returned data, prioritise improvement ideas and transfer them into well-planned projects.
4. The GOA-Solutions methodology can help produce competitive advantages - improvements in the behaviour of employees, competence improvement, development of a corporate culture, etc.
5. Enterprises do not need immense resources for successful operations; all they must do is choose the most appropriate self-assessment tool.
6. GOA-Solutions methods and procedures can seem too complicated for many companies because it requires adjustment.
7. GOA-Solutions users consider that simplification when adapting the GOA-Solutions methodology is highly recommended as selfassesment tools.
8. The manager of the company must support the purchase and implementation of GOA-Solutions, inform employees about the tool and involve them in the tool adaptation process.
9. The manager of the company must take into account the strengths of the company, identified with the help of the aforementioned tool, as well as areas where improvements are needed according to employees.
10. The developers of GOA-Solutions should strive to adapt the tool to different fields. Currently, the tool is available for education centres, state entities, NGOs, medical centers and manufacturing companies. The application of the tool could be extended and offered to organizations such as those in the financial sector and hospitality, among others.

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EUROPEAN FUNDING: DOES IT INDUCE EXPORTS?

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Abstract. Since the European Central Bank loosened its monetary policy, there has been an upswing in European competitiveness. Therefore, it is reasonable to look to the exporting sector and its growth prospects to find the impact of this structural change. In this study, we examine one specific country—Latvia—to find the impact of European Structural and Investment Fund (ESIF) financing on Latvian companies' tendency to export, disaggregated between large and small companies, "experienced" and "less experienced" management, and lastly between ESIF funds. We used a difference-in-differences methodology, combined with propensity score matching to eliminate the impact of any factors other than the "treatment" with EU funding and thus prove a positive relation between receiving EU funding and the exporting decision. We find a statistically significant, positive effect on exports' revenues for the funding recipients over those that had not received ESIF financing, the average treatment effect on the treated of which is 24.7%. What is more, we also find that, as we hypothesized, small companies would experience a greater effect from this influx of capital; more experienced management used the money more efficiently; and the agricultural investment fund had a more pronounced impact on the exporting decision than the regional development one. It can therefore be concluded that ESIF financing is indeed a boon to the Latvian economy and its competitiveness. These findings should indeed yield the government some insight into more efficient ways to allocate the delegated capital.

Key words: *European funding, exporting, export promotion*

JEL code: C32, C25, F41, O19

Introduction

In recent years, economic growth has become something akin to an "ultimate goal" of modern capitalistic markets in the eyes of both expert economists as well as the general populace. While economists bend over backwards to force their economies to expand, the average worker simply wants to see his paycheck bigger than it was the previous year. In a world of open economies, the market allows for transfers of goods, services, capital, and other assets from one state to the other, allowing countries to borrow or otherwise take advantage of the wealth that another economy produces. Furthermore, international trade specifically allows for the exploitation of comparative advantages and specialization, e.g., the United States of America imports cheap consumer goods from China, but at the expense of American manufacturing. Therefore, it comes as no surprise that the activity of exporting has garnered an immense amount of research over the years.

While there is ample academic research on the impact of financial aid on international trade, one would be hard-pressed to find any studies that examine this relation within the EU. Furthermore, Latvia is a prime target to perform many types of tests on ESIF funding due to two main reasons: (i) the efficiency of EU funding programs is always a prominent question, especially so due to known fraud cases (EsFondi.lv, 2017) and (ii) the disproportionately high

We would like to thank Dr. Tālis Putniņš, Dr. Konstantins Benkovskis, Anna Zasova, and Marija Krumina for their continued support and contribution to our paper. Furthermore, we express immeasurable gratitude to the National Research Program SUSTINNO that has generously supported this research.

importance of ESIF funding to the Latvian economy—a fact proven during the whole of 2016 where a stagnant absorption of EU funding resulted in an 17.9% reduction in construction revenues (The Latvian Ministry of Finance, 2017).

Therefore, this is precisely the gap which this study attempts to fill—we seek to determine whether ESIF programs allocate capital to export promotion and answer our research question:

RQ: *Does European Structural and Investment Fund financing promote export activity*?

While there is no clear indication in the ESIF regulatory documents that its financing is intended to promote recipient nation exporting, clearly the funds do so indirectly. Firstly, recipients are able to use the funds to cover sunk costs related to establishing an export activity by, for instance, using this money to pay a participation fee in foreign expositions; Secondly, receiving ESIF funding creates informational channels that allow for easier access to other member markets. This may be done by gaining access to conferences for ESIF recipients; Lastly, one of ESIF goals is to promote competitiveness and productivity. As export propensity is later shown to be linked to these elements, it can be concluded that:

H1: *ESIF recipient companies are more prone to export than those that have not received such financing*.

To answer our research question, we will employ a difference-in-differences analysis methodology with matched control and treatment groups. We believe that, by employing the propensity score matching method to create a control group that is similar to our treatment group, we can single out the effect ESIF funding has on export activity. Our dataset is a survey of 675 companies out of an original dataset of 799 which met our criteria of the variables necessary to conduct our research. Our dataset covers the following variables that are used in our paper: whether the specific firm exports and if it does, what proportion of revenues are earned from exporting, revenues in euros, company age, management experience in years, if a company has received ESIF funding and if it has, what fund did it receive it from, the specific enterprise's ownership structure (foreign vs domestic), and the size of the company in terms of employees.

The remainder of this paper is structured as follows: section two outlines the current literature on exporting, includes a subsection on the specifics of the two EU funds covered by our dataset; section three explains our research method and describes our dataset; section four describes our empirical results and discusses them; and section five concludes.

Literature review

To prove a causal relation between ESIF finances and export propensity, we must also justify it with academic literature. To do so, we first ascertain the stronger determinants of exporting and then, from this sample, find such variables that can be either supplemented or increased due to a firm receiving ESIF funding.

Export determinants

Das, Tybout, and Roberts (2007) show that sunk costs, the costs of establishing an exports-based business such as legal fees in order to draft country-specific contracts, have a strong impact on whether a company would become an exporter. They argue that to begin exporting a company is required to put forward a considerable investment of time and money. Therefore, firms that were exporting in the last period, will most likely also export in the next (Das *et al.,* 2007). Their results suggest three important findings. Firstly, that sunk costs are a significant deterrent for companies to begin exporting and that per-unit subsidies are much better than lump sum grants to promote exporting due to higher possible profits. Secondly, that large firms can enter international markets with greater ease than small firms, because their size allows to cover the associated costs with less trade-offs. And lastly, that foreign ownership is associated with a higher probability of exporting, presumably due to reduced costs associated with the creation of informational channels, which are also a significant variable for the exporting decision (Das *et al*., 2007).

The notion of foreign ownership spillovers is strongly echoed by Aitken, Hanson, and Harrison (1997) as they test for whether Multi-National Enterprises (MNEs) have a positive impact on the indigenous firm's exporting tendencies. The findings of their study tie in well with the previously outlined notion of high sunk costs acting as barriers to exporting. They conclude that MNE partners may alleviate various constraints, such as buyer-seller relations, technology requirements, or superior management practices (Aitken *et al*., 1997). The study also concluded higher wages have a positive impact on exporting propensity, because, as they argue, the increase in competitiveness that ensues due to exporting will make the companies pay higher wages. The notion of a positive relation between exporting and high wages is reinforced by Bernard and Jensen (2004) with their research with which they aim to show the full spectrum of reasons due to which a company may choose to go into exporting as well as the opposite—why one may be deterred from beginning an export-based business. What is more, there is another finding that is rather curious in Bernard and Jensen's paper—they find no evidence that US export-supporting programs are working to improve exporting in general. They do mention that this might be due to sample bias, though, the notion remains that the US might be failing to actually support their exporting industries with policies directly targeted at them. We believe that this adds more weight to our findings, as we find that ESIF funding has positive effects on export propensity, therefore, we outline, perhaps, another research gap—the institutional differences between the American and the European funding distribution systems. Knowing, essentially, what these US institutions did "wrong" may prove to be useful information to some governing facilities.

The findings of Das et al., Aitken et al., and Bernard and Jensen, are further strengthened by Masso and Vahter (2015), as they prove that productivity is indeed positively linked with exporting. While the main goal of their study is to prove learning-by-exporting, i.e., that companies tend to become more productive after their entry into the international markets, their results also imply strong selection effects, thus indicating that high productivity may be a prerequisite to begin exporting to cover the associated sunk costs.

Of the set of export determinants, we find that firm size and management experience would have clear a path by which EU funding might affect exports. We outline two hypotheses regarding both variables, i.e., firm size and management experience. Due to how disproportionately strong the export-deterring impact of sunk costs can be to smaller enterprises, assuming ESIF recipient exporters use their funding to cover these costs, we believe that:

H2: *the effect that recipience of EU funding has on exports will be more pronounced for small firms*

While, regarding management experience, we argue that more experienced managers distribute this additional capital much more efficiently than the inexperienced, therefore, we expect:

H3: *higher EU funding impact on exports if the company's management is "experienced[1]"*

Fund-specific implications

We find evidence that: (a) neither of the two funds' goals contain export stimulation as a funding priority, therefore, the effect our research shows is inadvertent; and (b) the investment areas differ across the two funds, meaning that it is expected that the effect each fund has on export propensity is different. The planning documents of ERDF in Latvia show that 10.5% or (474 million Euros) of its funding was directed toward entrepreneurship and innovation (Latvian Ministry of Finance, 2013). We believe that this is reason enough to believe that ERDF could be promoting export activity indirectly through, e.g., participation in international expositions or conferences—two events in which producers would have an easier time finding importers or buyers of their goods. While, for EAFRD, we find not only rural competitiveness as an investment objective, but also EU agricultural goods' promotion policies meant to advertise European agricultural and maritime produce on the international markets (Latvian Ministry of Agriculture, 2017). It would be a difficult, if not impossible, task, however, to attribute some specific amount of agricultural exports to ESIF funding

[1] a variable whose disentanglement will be provided in the data description

or these promotion policies, as it would require a separate paper to investigate the success of these programs. In Latvia, rural development and agricultural support financing for the 2007-2013 planning period was 808 million Euros a value that far outweighs ERDF investments[2] (Rural Support Department, 2013). From this we hypothesize that:

H4: *EAFRD funding recipients will, on average, export more than those that have received ERDF support*.

Furthermore, we find that there are varying requirements for different investment objectives, which leads us to conclude that the distribution of our EU funding variable is non-random (European Structural and Investment Fund, 2016). As visible from the binding agreements, the requirements for application to EU funding are not distinctly quantitative—while there are some requirements for minimum turnover, there are no requirements for management experience, company age, and such company characteristics that one could compile into a dataset. The implications of this are outlined in the methodology section.

Methodology

If we were to run a simple Ordinary Least Squares (OLS) regression, regressing our binary variable for EU funding on exports, our estimators would be highly biased due to an abundance of omitted variables as well as self-selection and other issues. Therefore, to escape the various issues surrounding such a simplistic model, we first and foremost employ a difference-in-differences (DID) method as done by Card and Krueger (1995), where they tested the impact a minimum wage increase had on New Jersey's employment in 1992. The DID method relies on finding a control group that fulfills the parallel trend assumption—an assumption that, without "treatment" (in their study, a minimum wage increase; in this one, receiving EU funding), both the treated and untreated groups would develop similarly. Through observation of historic data, Card and Krueger established that New Jersey's economy was highly comparable with that of Pennsylvania. This similarity of economies allowed them to control for all unobserved variables that impact employment changes in either city, such as seasonality and external shocks, by subtracting the differences in employment statistics before and after the minimum wage was increased in New Jersey. Since then, the DID method has been widely used to determine a causal effect of various treatments on the treated group. The DID method can be described with the following formula:

$$\delta = (\gamma_{11} - \gamma_{21}) - (\gamma_{12} - \gamma_{22}) \quad (1)$$

where, δ denotes the treatment effect, γ_{12} and γ_{11} denote the treatment group before and after treatment, and γ_{22} and γ_{21} denote the control group at both observations (Card & Kreuger, 1995).

However, Card and Krueger's case was quite specific in the sense that they had found the perfect control group to test their hypothesis. We do not have the luxury of the parallel trend assumption between ESIF recipients and all other companies in our dataset, as they are largely different from one another. Therefore, we combine the DID method with propensity score matching to create a control group that is highly similar to our treatment group by a set of covariates. A comparison of EU funding recipients against all other Latvian companies would essentially be similar to comparing professional athletes to hobby runners—we could never know for sure if the funding received truly impacted export propensity of these companies or if they were predisposed to a higher export propensity due to the lack of a base standard of comparison. Hence, to single out the effect of ESIF funding on exports, we compare the companies that received funding to a pool of companies that could have received these funds but did not, while still being similar in all other relevant characteristics to those that did receive funds.

[2] Our intention by showing this comparison of investment size is to show a general trend—that EAFRD tends to invest more in agricultural companies than ERDF does in enterprises. By using said data, we do not mean to draw any conclusions regarding effect size.

Propensity score matching and the ATT

First published by Paul Rosenbaum and Donald Rubin in 1983, the propensity score matching method tries to deal with the endogeneity problem that occurs when researchers study effects of treatment in a non-experimental setting (Rosenbaum & Rubin, 1983). This methodology has been used multiple times afterwards to estimate the effect of various policies and external events on some characteristics and often it is used in conjunction with propensity score matching (e.g., Girma, Greenaway, & Kneller, (2004), Girma, Gorg, & Strobl, (2007)). Most economic treatment effects are non-random, thus, comparing the performance of a treatment group to the performance of the population leads to strong selection bias. This is also the case given our study, as we previously outline that ESIF funding is not awarded randomly. However, by creating a propensity score and matching companies by it will allow us to separate said selection biases because we will be comparing companies that have equal probabilities of having received ESIF funding and therefore equal selection biases associated with their data. And, as we combine propensity score matching with a DID methodology, we subtract the equal selection biases, thus nullifying them.

The propensity score is simply the conditional probability of observed individuals to become treated, which yields: $$p(X) \equiv \Pr(D = 1|X) = E(D|X) \quad (2)$$

where, D is the binary treatment variable (for us, D = 1 if said company has received EU funding and zero if it has not), and X is a set of covariates by which our propensity score is formed (for this study, these are company characteristics by which we form the probability of receiving ESIF funding). We estimate our propensity scores by running a probit regression, regressing our covariates—firm size, foreign ownership, age, labor size, management experience, and whether the firm was an exporter 5 years ago—on our binary ESIF funding variable.

$$EUFunds_i = \beta_{const.} + \beta Size_i + \beta Frgn_i + \beta Age_i + \beta Labor_i + \beta Mgmt_i + \beta Exporter_i + \varepsilon_i \quad (3)$$

where, $EUFunds$ is a binary variable for whether the company has received ESIF funding, $Size$ is the company revenue, $Frgn$ is a binary variable that is one if the company is foreign-owned and zero if it is not, Age shows company age in years, $Labor$ is the number of workers the company employs, $Mgmt$ is the years of work experience that the management has accumulated, $Exporter$ is revenue received from exports five years ago, and β_{const} and ε_i are the intersection and error terms respectively.

As there is no dataset from which we may simply create a control group whose $p(X)$ of the treated would be equal to the p(X) of untreated for every firm, we use the Nearest-Neighbor Matching (NNM) method. This method dictates that each treated observation is matched with an observation from the control group with the nearest propensity score. NNM is also used by Masso and Vahter (2015) and Kangahsharju, (2005). They use very similar microeconomic data and find NNM to be the best way to deal with treated and untreated group differences after obtaining propensity scores., We therefore feel inclined to follow in their path.

In our study, we matched firms with one and two nearest neighbors to show robustness of our results. Another note on our matching method specifies that, due to the size limitations of our dataset, we chose to match with replacement. This means that multiple treated firms may be matched with one control firm. Additionally, as we outline in the Fund-specific implications section, there are no clear determinants of EU funding receipt. Therefore, we simply test for statistical significance among available company characteristics and use those as predictors. We find the greatest significance in variables for company turnover in 2010, foreign ownership, labor size, years of company export experience, management experience, and whether the company was an exporter in 2010.

After matching our samples by NNM, we estimate the Average Treatment effects on Treated (ATT) with a simple OLS regression by following Becker and Ichino (2002) guidelines on implementing Rosenbaum and Rubin (1983) model:

$$\begin{aligned}\tau &= E\{Y_{1i} - Y_{0i}|D_i = 1\} \\ &= E[E\{Y_{1i} - Y_{0i}|D = 1, p(X_i)\}] \\ &= E[E\{Y_{1i}|D_i = 1, p(X_i)\} - E\{Y_{0i}|D_i = 0, p(X_i)\}|D_i = 1] \end{aligned} \quad (4)$$

where, τ is the ATT, $p(X_i)$ is the propensity score, and Y_{1i} and Y_{0i} are the two possible outcomes dependent on treatment (D). From Equation (4), we can explain ATT as the difference in the dependent variable between treated and untreated groups, conditional on the propensity score, given that treatment is equal to one, or more intuitively, we match two companies—one that is treated and another that is not—by their propensity scores and take the difference in their dependent variable. As previously mentioned, we will use a DID method, therefore, our dependent variable (exports) will be a difference—this means that we will study the impact of ESIF financing on export growth or conversely, a decrease in export activity. Therefore, as we perform the same analysis as before, that is take the difference in dependent variables, given that we have matched our companies by their propensity score and that one firm receives EU funds, we arrive at a difference in the differences of export revenues achieved through a matched sample.

Dataset description

Our dataset is a survey designed by our supervisor and professor Dr. Tālis Putniņš that consists of 799 Latvian companies. The survey covers both quantitative as well as qualitative questions regarding firm characteristics. Regarding the quantitative description of companies, the survey has three time points: (i) variables such as turnover, export percent of turnover, employee number, management experience are reported five years ago (2010); (ii) the same variables but in present day (2015); (iii) and what is the composition of necessary funding sources in the last three years.

It is immediately visible that the survey was crafted in such a manner to allow for use of DID methodologies to study relations between variables as one of the prerequisites of DID is that treatment is received within the studied timeframe. Of all the available data, we have used the following elements in our model:

- Firm size measured by annual turnover in EUR;
- Number of employees (full-time equivalent), including management;
- Domestic sales (% of turnover), i.e., inverse of proportion exported;
- Year the company was established (used to calculate company age);
- Years of managerial experience of the top management; and
- Whether the controlling owner is local or foreign.

After acquiring the necessary information, we consolidate the data into a single file then we "clean" or filter it to the point where we are only left with reliable and accurate variables. For cases in which all key variables were missing, the observations are dropped entirely. For cases of "ORBIS" supplying faulty values, the observation is changed to the self-reported survey value. We purposely remove all government-held companies as they do not operate according to free market constraints, and therefore yield no valuable information regarding ESIF funding and its impact on the exporting decision.

Finally, the dataset discards observations that are below the 1st and above the 99th percentile (and, as a robustness check, 2nd and 98th percentile as well) before the analysis is conducted. After these actions, our dataset now consists of 675 companies for which we most of the necessary data to perform our research. We find that, for a multitude of companies, we are still missing values regarding many control variables, e.g., labor size and management experience. This narrows the scope of our research as we are then limited in the factors we can control for in the model.

Disaggregation of subgroups

To test our hypotheses with a difference-in-differences analysis, we must divide our sample into appropriate subgroups. In terms of our primary research question—whether ESIF funding promotes exporting, and if so to what

extent—this would simply be the treatment and control groups. Our dataset contains 93 companies that have received EU funding, thus, if we were to assume random assignment for ESIF funding, our control group would consist of 582 companies. However, as we have concluded that EU funding is non-random, we must form a viable control group, the forming of which is described in the methodology section. From the companies in our two sub-groups, we are specifically interested in the performance of companies that were previously exporting but ceased to do so, companies that only began exporting in the last five-year period and companies that exported beforehand and still export now; we denote this group as exporters. Once divided so, our treated sample is 47 ESIF recipients-exporters and 184 untreated exporters.

As outlined in the literature review, we hypothesize that ESIF funding has a more pronounced effect on small enterprises than on big firms. Similarly, we also wish to test the different effects of management experience can have on export growth, conditional on receipt of funding. As our sample is fairly small, we cannot afford to choose arbitrary thresholds for when a company is large or when a manager is "experienced". To overcome this, we have chosen to work with values relative to our dataset: the company is labeled as large if its size is higher than that of the mean treated company; while the converse is true regarding small enterprises. Managers are "experienced" if they have more years of experience than the mean manager of a recipient firm; while the converse is true for inexperienced managers. By employing this kind of logic, we find

that, in our sample, a "large" company is one with turnover above 1.1m EUR and "experienced" managers have upwards of 20 years of managerial experience. Table 1 examines summary statistics of our data for the various groups.

Table 1

Data summary statistics

	Non-recipient exporters				Matched sample				Recipient exporters			
Parameter of interest	**Mean**	**St.dev**	**Min**	**Max**	**Mean**	**St.dev**	**Min**	**Max**	**Mean**	**St.dev**	**Min**	**Max**
Turnover exported, % (2010)	44.59	38.60	0	100	60.56	36.35	0	100	49.53	38.48	0	100
Turnover exported, % (2015)	43.06	37.00	0	100	47.36	39.58	0	100	61.13	32.59	0	100
Number of employees	24.79	41.97	1	360	25.93	48.82	1	36	71.71	131.78	1	700
Turnover, mln EUR (2010)	2.67	6.91	0.001	7.33	4.42	7.42	0.007	26.4	7.35	4.3	0.010	14.3
Turnover, mln EUR (2015)	3.42	11.2	0.008	133	4.60	8.33	0.001	29.8	8.81	4.90	0.022	22.8
Management experience, years	15.16	8.73	2	50	14.83	8.06	2	40	18.42	7.31	3	35
Age, years	15.10	8.06	5	70	17.58	8.73	5	70	19.46	10.39	6	76
Number of observations	177				46				44			

Source: Created by the authors. Summary statistics for three groups of samples—all non-recipient exporters, the propensity score-matched non-recipient exporters, and recipient exporters. We summarize mean values and standard deviations.

Limitations

As previously mentioned, our sample size is relatively small, 799 companies before dataset cleaning; this issue becomes significantly more prominent as we refine the dataset and check for missing or false values. Once the dataset narrows down to ~40-45 observations for some specific groups, the issue of missing values becomes an insurmountable obstacle as we cannot, for instance, test for industry-specific effects because the observation count for some industries is too low to gain significant results.

Propensity score matching is a very popular method for distinguishing a comparable sample in a non-random treatment setting. However, it renders our results rather sensitive to the matching principles we choose. The results can vary widely between propensity score matching methods and we show this variation in our robustness check section.

Another concern is that the covariates that we use for propensity score matching may not explain a significant share of probability associated with EU funding allocation. Although our method was to select the best variables from

those that were available in our dataset, we encourage the search for other relevant variables if possible. Many of the variables we believe to be relevant are plagued by a dataset-wide omission, i.e., the information was missing for a sizable amount of observations. Nonetheless, we still believe that the questionnaire is reliable despite any possible missing values.

Furthermore, a difficulty arises with the interpretation of our results: when one looks strictly at an increase in the proportion of exports' revenues without an additional view of the absolute changes in turnover, an increase in exports may arise simply by a decrease in domestic sales. However, Table 1 shows that revenues have generally increased for both our non-recipient and recipient exporters. There is still some ambiguity for specific firms, yet, for both samples at large, the argument seems moot.

Discussion of Results

The study was performed to find whether EU Funding has a positive impact on Latvian companies' tendency to export. For this purpose, propensity score matching and difference-in-difference methodology was applied to a dataset obtained by combining survey data, publicly available company data, and publicly available records of ESIF funded projects.

While conducting our research we came across several companies whose primary focus for the EU money was buying equipment to produce higher quality goods or participation in international conferences, which is essentially development of informational channels. This, in addition to the wild fluctuations in the beta coefficient for EU funding, caused by changes in matching principles or the lack thereof, signifies that applying the DID methodology without propensity score matching creates a substantial bias in our estimators, which further strengthens our commitment and confidence in our methodology and results. Table 3 describes the results regarding our primary research question.

Table 3

DID estimates with various dataset configurations.

	Full sample ATT	ATT with 1NN	ATT with 2NN
(Trimmed @1%)	0.1303107***	0.246956523***	0.193804349***
(Trimmed @2%)	0.0557318 **	0.103488371***	0.08116279**
(Winsored @1%)	0.1153793***	0.208936171***	0.178510638***
(Winsored @2%)	0.1121103***	0.206808512***	0.174255317***
Unedited	0.1151619***	0.208936171***	0.178510638***

Source: Created by the authors. ATT estimation for various constructions of the dataset. The first column shows the ATT without matched samples, i.e., the effect of EU funding on export propensity of all firms, the second column shows the base case of ATT with matched samples and NNM with 1NN, and the third column expands with NNM with 2NN.

The results have answered our research question and proven our first hypothesis (H1) true—there is a positive relation between receipt of EU funding and growth in share of turnover exported over a five-year time-span. All robustness checks indicate a strong, statistically significant effect ranging from 5.57% to 24.69% at varying confidence intervals, that never breach the 95% level. We believe that this is a very positive finding regarding EU funding, as we have previously outlined the beneficial effects of export activity.

As outlined in the Methodology section, in absence of treatment, the DID method assumes a parallel trend in the development of both groups. In other words, if the companies did not receive the funding, their share of turnover exported would have decreased from 47.87% to 34.11%, but as they did, their share has grown to 59.09%. However, a closer look at the robustness checks reveal that slight changes in the method yield quite a wide range of results. In our opinion, the estimator serves more as an approximation tool than a predictor, a value that could be compared to evidence in other countries or over time. The small sample also could cause our results to be somewhat biased and the actual difference

could be much smaller. Even if we suggest not taking this number at face value, we do believe that the results are significant enough to say that the EU funding does impact Latvian company export participation in a positive way. Further, we offer a deeper analysis of the effects of EU funding by disaggregating the effect between various groups.

Small vs big

We expect the effect on smaller companies to be more pronounced due to our determination that sunk costs, the upfront costs of establishing an international business, is a significantly higher issue for smaller enterprises than it is for larger strictly by logic; a large enterprise will be able to cover these costs with ease due to their proportionately higher revenues. The data shows a minor inclination toward this notion. Whereas the estimator is marginally higher for smaller companies than it is for larger enterprises, the statistical significance of it is non-existent. Therefore, we cannot conclude that there is any difference between these effects. From Table 4, we one can see that, for our base case (see, trimmed at 1%), the estimators for both small as well as large companies are significant, demonstrating the strength of the coefficients as standalone predictors. However, once we perform a test for whether these estimators are statistically different from one another (done by testing if their subtraction is equal to zero), we cannot reject the hypothesis that they are not.

Table 4

ATT estimation for a dataset disaggregated between small and large companies.

	NNM with 1NN or "ATT"		
Subgroup	**Untrimmed**	**Trimmed at 1%**	**Trimmed at 2%**
DID for Small companies	0.2416667**	0.3154857***	0.1371212**
DID for Large Companies	0.2250408***	0.2401339***	0.0874808**
Difference in means	0.0166259	0.0753518	0.0496404
Prob > chi^2	0.8876	0.5828	0.5208

Source: Created by the authors.

While this does not prove our hypothesis (H2) true, we believe that the result still somewhat adds to our notion. The effect is more pronounced for smaller companies than it is for larger ones for all variations of the method. We believe that, despite the insignificance of their difference, we can still draw some value from the test.

Managerial experience

We argue that more experienced managers will recognize the benefits of going into export markets and do so with more persistence than those managers that have not spent as much time in the field. The data proves our expectation true—we find that more experienced managers do, in fact, use the additional capital to either enter the international markets more efficiently, as seen in Table 5. We find that the estimator for inexperienced managers is weakly significant and simply low in absolute terms, while the estimator for experienced managers is significant at every level and considerably higher. While, again, we feel the need to emphasize the fact that we believe these values to be more indicative than predicting, as the function of this effect would most definitely not be binary—crossing the 20-year experience mark will not make a manager suddenly three times more likely to go into exporting. The true curve is likely non-linear, however, the form of it we do not predict and could not predict with the size of our dataset, as if we were to divide our sample in more age groups, we, in many cases, fall below 10 observation points, creating immense biases in our estimators.

Table 5

ATT estimation for a dataset disaggregated between small and large companies.

Subgroup	NNM (with 1NN) or "ATT"		
	Untrimmed	**Trimmed at 1%**	**Trimmed at 2%**
DID if experience <20 years	0.121806*	0.137795*	0.0457273
DID if experience >20years	0.3036905 ***	0.3893478***	0.1578468***
Difference in means	0.1818845	0.2515528	0.1121195
Prob > chi^2	0.0659	0.0421	0.0590

Source: Created by the authors

The data reveals that the difference in estimators is statistically significantly non-zero at the 5% confidence level, giving us clear indication that our hypothesis regarding managers (H3) cannot be rejected—more managerial experience translates into more of EU funding being awarded to export activity promotion, development, and anything that increases its revenues.

Fund-specific effects

We argue that the effect for EAFRD would be more pronounced than that of ERDF due to the specifics of their investment objectives as well as the size of them. EAFRD invests more into the private sector than ERDF does, therefore, we expect it to have a greater impact on export propensity. We find that the effect of EAFRD is in fact stronger than that of ERDF, however, the statistical test proves that the estimators are not significantly different from one another (see, Table 6, Prob > chi^2). Still, as with the company size, we feel that it is rather indicative that the effect of EAFRD is, for all variations of our model, stronger than that of ERDF.

Table 6

ATT estimation for funding received from EAFRD vs ERDF

Subgroup	NNM (with 1NN) or "ATT"		
	Untrimmed	**Trimmed at 1%**	**Trimmed at 2%**
ERDF	0.1766768***	0.2002273***	0.0745412**
EAFRD	0.2462222***	0.2765909***	0.1157317***
Difference in means	0.0695454	0.0763636	0.0411905
Prob > chi^2	0.3378	0.3046	0.3760

Source: Created by the authors.

While we cannot reject the hypothesis that these fund-specific effects are the same, and thus prove our hypothesis (H4) false—we believe that there is some indicative value.

Overall, results of our study are satisfactory and two of four hypotheses are confirmed:

H1: *EU Funding does promote Latvian company tendency to export more.*

H3: *More experienced managers funnel a higher proportion of EU funding into exporting.*

Conclusions

We set out to test the effect of EU funding on the Latvian exporting sector—do the programs expand it? Do they limit it? We find that the ESIF financing system is, in fact, a boon to the Latvian economy and it is proven that it increases recipient companies' tendency to export by approximately 25%. We feel that the significance as well as the magnitude of this estimator is immensely valuable to the government institutions responsible for implementation of the program. The previous sections lead us to believe that by considering management experience and size as their allocation criteria. A

very rough estimate is that the gain from such a move could be upward of 17.9 EUR in exports for each EUR of allocated capital. Additionally, even though there are minimum requirements to apply for financing, the impact could also be improved by specifically targeting companies with turnover below 1 million. While we cannot be certain about the true extent of the added benefit, we suggest studying the segment more to determine it.

Furthermore, we disaggregate the effect between small and large enterprises, experienced and inexperienced management, and ERDF and EAFRD funding effects. We find that, while small companies do have a higher estimator, the difference between the two estimators is insignificant, therefore, we cannot say with confidence that smaller companies are more prone to use the funding for exports. We find that experienced management does, in fact, invest more of the received funding into export activity, and the difference between the estimators is significantly non-zero. We argue that this may be due to the managers having better contacts or business prowess, however, the channels by which experienced managers increase their exports will remain unknown until qualitative studies are conducted on their characteristics. We expected EAFRD to have a more pronounced effect on export propensity, an expectation that partially came true—while the fund did have a higher beta coefficient, the difference between the two funds' estimators is insignificantly non-zero, therefore, we cannot say with full confidence that either fund impacts export propensity more.

As we outline in the final sections of our paper, we believe that the results of our research can be used to form more effective funding allocation systems. That is, if exporting and characteristics of the activity are included in the fund's investment objectives. As we have shown, there are none that invest directly into exporting, however, regional development and some of its sub-goals align with the effects of export activity quite well.

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MACROECONOMIC EFFECTS OF THE ASSET PURCHASE PROGRAMME: STRUCTURAL BAYESIAN VAR APPROACH

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Abstract. To prevent the Eurozone economy from entering a deflationary spiral and to achieve its main goal – maintaining price stability – the European Central Bank (ECB) announced the Asset Purchase Programme (APP) on January 22, 2015. The purchases of public and private securities started in March 2015 and are intended to be carried out until December 2017 or until the inflationary path is consistent with the inflation target.

The aim of this paper is to evaluate the macroeconomic effects of the APP on the euro area output and price level and determine the channels through which the asset purchases are transmitted to the real economy. The empirical evidence on the macroeconomic effects of the APP is provided by Wieladek and Garcia Pascual (2016) and Zlobins (2016). These papers identify the QE shock from the asset purchase announcement variable and as a reduction in the long-term interest rate spread respectively. This paper expands the literature by identifying the QE shock from the quantity variable, i.e., securities held by the Eurosystem.

In order to assess the macroeconomic effects of the APP, we estimate a structural Bayesian vector autoregression (VAR) with normal-Wishart prior. The model is then used to obtain impulse response functions to the QE shock which is identified from the quantity variable by using sign and zero restrictions. The results from the structural Bayesian VAR model suggest that the APP has had a significant positive impact both on output and price level. The evidence suggests that the APP was transmitted to the real economy through the portfolio rebalancing, signaling, credit easing and exchange rate channels, while the uncertainty channel had no significant effect.

Key words: *Asset Purchase Programme, Bayesian VAR, Eurozone, quantitative easing, sign restrictions*.

JEL code: C54, E47, E58.

Introduction

Following the Great Recession, short-term interest rates in advanced economies quickly approached their lower bounds and were no longer effective in influencing long-term interest rates and ultimately in stimulating output and increasing inflation sufficiently to meet the inflation target. Central banks switched to unconventional monetary policy measures such as quantitative easing to steer long-term interest rates downwards and revive inflationary pressures in the economy.

In order to prevent the Eurozone economy from entering a deflationary spiral and to achieve its main goal – maintaining price stability – the European Central Bank announced the Asset Purchase Programme on January 22, 2015. The purchases of public and private securities started in March 2015 and are intended to be carried out until December 2017 or until the inflationary path is consistent with the inflation target. The programme amounted to €60 billion of monthly purchases in its first year of operation, however in March 2016 it was decided to expand the programme to €80 billion of monthly purchases from April onwards to compensate for the additional economic shocks which the euro area has experienced. However, by the end of 2016, the outlook became more favourable and in December the ECB voted to reduce monthly purchases to €60 billion again from March 2017 onwards.

The aim of this paper is to evaluate the macroeconomic effects of the APP on the euro area output and price level and determine the channels through which the asset purchases are transmitted to the real economy. The empirical evidence on the macroeconomic effects of the APP is provided by Wieladek and Garcia Pascual (2016) and Zlobins (2016). These papers model the QE shock from the asset purchase announcement variable and as a reduction in the long-term interest rate spread respectively. This paper expands the literature by identifying the QE shock from the quantity variable, i.e., securities held by the Eurosystem.

To assess the macroeconomic effects of the APP, we estimate a structural Bayesian vector autoregression with normal-Wishart prior. The model is similar in spirit to Weale and Wieladek (2016) and Wieladek and Garcia Pascual (2016), however we choose to incorporate proper rather than non-informative prior to minimize the risk of overfitting due to relatively short time series. To reduce the risk that the subjectively specified prior is too tight, thus dominating the information from the sample, hyper-parameters are treated as additional parameters to be estimated from the data. The values for the hyper-parameters are derived using the procedure developed by Giannone et al. (2015) to maximize the marginal likelihood of the model. The model is then used to obtain impulse response functions to the QE shock which is identified from the quantity variable by using sign and zero restrictions. The sign restriction approach allows theoretically grounded impulse responses to the identified shocks to be obtained, but to let the data speak, we implement these restrictions only on impact. To determine which channels play a role in transmitting the effects of asset purchases to aggregate demand and price level, additional variables describing the portfolio rebalancing, signaling, credit easing, uncertainty and exchange rate channels are added to the model one by one. This modeling approach is based on the assumption that if the channel transmits the effects of quantitative easing, then its impulse response to the asset purchase shock is statistically significant.

1. Econometric Framework

Most studies, which estimate the macroeconomic effects of the QE in a VAR framework, utilize a structural VAR model where asset purchase shock is identified by implementing sign and zero restrictions on impulse response functions to evaluate the macroeconomic impact of the QE. In this study, the author employs a structural Bayesian VAR in the spirit of Weale and Wieladek (2016) and Wieladek and Garcia Pascual (2016) to assess the effects on economic activity and price level from quantitative easing shock in the euro area. When Bayesian methods are used to estimate a VAR model, the parameters are treated as random variables and *a priori* information is used to limit the parameter space. Bayesian shrinkage is an appropriate tool to overcome the overfitting problem due to relatively short time series (Canova (2007)). Banbura, Giannone, and Reichlin (2010) show that if the data has a collinearity, which is true for the macroeconomic datasets, then relevant sample information is not lost when overfitting is resolved by means of Bayesian inference. The author estimates the following VAR(p) model:

$$y_t = a_c + \sum_{j=1}^{p} A_j y_{t-j} + e_t \qquad e_t \sim N(0, \Sigma) \quad (3.1)$$

where a_c is a vector of constants, A_j is an $m \times m$ array of coefficients, y_t for $t = 1, ..., T$ is an $m \times 1$ vector of m variables and e_t is an $m \times 1$ vector of residuals with variance-covariance matrix Σ. The issue with impulse response functions from unrestricted VAR models is that the shocks $e_{c,t}$ are correlated, thus any responses to the shocks have no economic meaning. The solution is to use a structural VAR model where the shocks are orthogonalized:

$$D_0 y_t = a_c + \sum_{j=1}^{p} D_j y_{t-j} + \varepsilon_t \qquad \varepsilon_t \sim N(0, \Gamma) \quad (3.2)$$

The shocks in 3.2 are given structural economic sense by making the residual variance-covariance matrix Γ diagonal. We use the approach developed by Arias et al. (2014) to infer about Γ using sign and zero restrictions. This approach is based on finding a matrix $D = D_0^{-1}$ that produces structural impulse response functions $\bar{\psi}_0, \ldots, \bar{\psi}_n$ which satisfy the restrictions from a specified identification scheme. A summary of the identification scheme we use to measure the structural QE shock is provided in Table 1.

Table 1

Identification scheme

Variable / Shock	Output	Price Level	Securities Held by the Eurosystem	10-year Bond Yields	Equity Prices
Aggregate Demand	+	+	0		
Aggregate Supply	+	-	0		
QE	+	+	+	-	+

The asset purchase shock is identified by restricting the holdings of securities to increase. As Figure 1 illustrates, the Eurosystem holdings of securities have increased by approximately 11 percentage points relative to nominal GDP since the launch of the APP in March 2015.

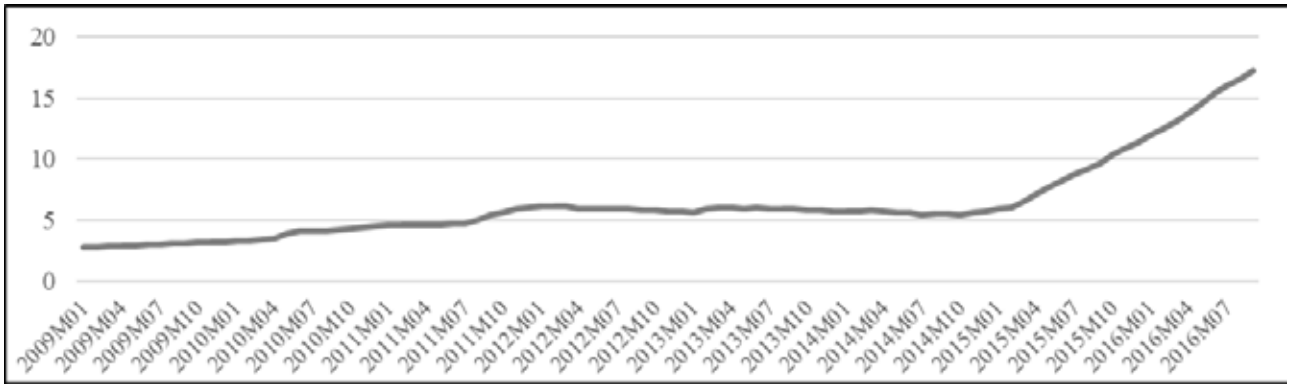

Fig. 1. **Securities held by the Eurosystem/annualized 2014Q4 nominal GDP (%)**

As a result of the central bank asset purchases, we assume that long-term interest rates will decline. This restriction is motivated by the evidence from Vayonas and Vila (2009) which shows that, because of financial frictions, quantitative easing can reduce the term premia of long-term bonds. Additionally, Bernanke et al. (2004) argues that when a central bank performs asset purchases, it signals that inflation and output are far from their desired levels, meaning that short-term interest rates will stay low for a prolonged period, driving down long-term interest rates as well. Because of lower government bond yields, we believe that investors will try to compensate the fall in the return of their portfolios by rebalancing them to higher yielding assets, e.g., equities. Due to higher demand, we restrict equity prices to rise following the QE shock. Finally, following Baumeister and Benati (2010) and Kapetanios et al. (2012), we choose to place restrictions on output and prices, but to let the data speak, we implement all restrictions only on impact. Thereafter, the response of the variables to the QE shock is decided by the data. Furthermore, we also identify aggregate demand and aggregate supply shock so that disturbances related to business cycle fluctuations are not confused with quantitative easing.

Table 2

Dataset description and transformations

Block	Variable	Description	Transformation	Data source
Standard model	Industrial Production	Volume index of production for Mining and quarrying; manufacturing; electricity, gas, steam and air conditioning supply. 2010 = 100.	100 × ln	Eurostat
	HICP	All-items HICP. 2015 = 100.	100 × ln, base year changed to 2010.	Eurostat
	Securities held by the Eurosystem/GDP	Securities of euro area residents denominated in euro held by the Eurosystem scaled by annualized 2014 Q4 nominal GDP	100 × ln	Author's calculations based on the ECB and Eurostat data
	10-year bond yields	EMU convergence criterion bond yields	Levels	Eurostat
	Equity prices	Dow Jones Euro Stoxx 50 Price Index	100 × ln	ECB
Portfolio rebalancing	20-year bond yields	AAA rated euro area central government zero-coupon yield curve spot rate	Levels	Eurostat
	30-year bond yields	AAA rated euro area central government zero-coupon yield curve spot rate	Levels	Eurostat
Signaling	One year forward rate spread	Spread between one year forward rate and EONIA	Levels	ECB
Credit easing	Corporate interest rate	Cost of borrowing for corporations	Levels	ECB
	Household interest rate	Cost of borrowing for households for house purchase	Levels	ECB
Uncertainty	VSTOXX	Dow Jones Euro Stoxx 50 Volatility Index	100 × ln	STOXX Ltd.
	CISS	Composite Indicator of Systemic Stress	Levels	ECB
Exchange rate	EUR/USD	Monthly average value of the euro against the US dollar	100 × ln	Eurostat
	NEER	Nominal effective exchange rate vis-a-vis the EER-19 group of trading partners (AU, CA, DK, HK, JP, NO, SG, KR, SE, CH, GB, US, BG, CZ, HU, PL, RO, HR and CN) against the Euro	100 × ln	ECB
Robustness	Real GDP	Monthly data of Real GDP index is obtained by performing Chow-Lin temporal disaggregation procedure using industrial production as an indicator series	100 × ln	Author's calculations based on the Eurostat data
	Core HICP	Overall HICP excluding energy, food, alcohol and tobacco. 2015 = 100.	100 × ln, base year changed to 2010.	Eurostat
	EONIA	Money market interest rate	Levels	Eurostat

The standard model consists of 5 monthly variables: output, price level, long-term interest rates, equity prices and securities held by the Eurosystem. As can be observed from Table 2, the variables enter the model in form of log-levels. As Sims, Stock and Watson (1990) demonstrate, such a specification allows cointegrating relationships between the variables to be captured and gives consistent parameter estimates even when unit roots are present. Besides that, expressing the variables as natural logarithms allows the results to be interpreted as elasticities, enabling us to estimate the total impact of the APP by scaling the impulse response functions. As for the sample period, the author estimates the model with data covering the period from January 2009 to September 2016. The decision to estimate the model over the

period since the onset of the Great Recession is motivated by the fact that, in this period, central bank balance sheet operations became the main policy instrument (Gambacorta et al. (2012)). The lag order is set to 2 via lag selection criteria.

2. Macroeconomic impact of the APP

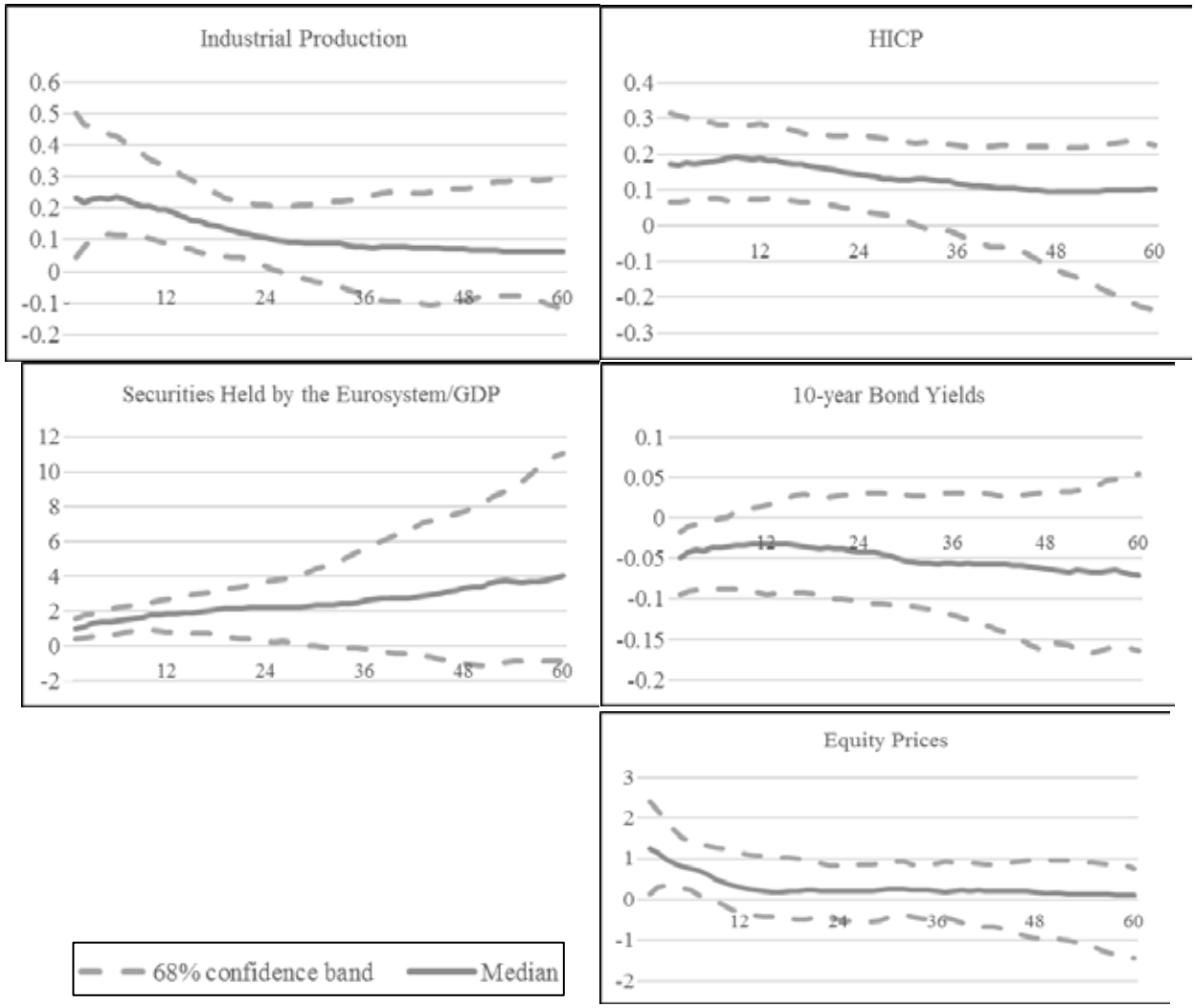

Fig. 2. **Results for the standard model**

Figure 2 shows the impulse response functions of the variables included in the standard model in response to a 1% asset purchase shock as a fraction of the annualized 2014Q4 nominal GDP. Impulse response functions are generated from 10100 Gibbs sampler iterations with the first 10000 discarded as burn-in. The vertical axis is expressed in percent, while the horizontal axis shows the number of months since the shock. The impulse response function of the Industrial Production shows that the maximum impact occurs six months after the QE shock and increases output by 0.24%. Considering that the Eurosystem asset holdings have increased by 11 percentage points since the start of asset purchases in March 2015, we can scale the peak response of the Industrial Production to conclude that, without the APP, the output would have been ~2.6% lower. However, the main reason for launching the APP was to counter the fall in price level and maintain price stability in the Eurozone. Thus, the primary interest for monetary policy makers in the euro area is the effect of the programme on price level. The impulse response function of the HICP demonstrates that the asset purchase shock worth 1% of nominal GDP raises price level by 0.19%. Thus, we can conclude that, without quantitative easing, the euro area price level would have fallen by ~2.1%. Turning to the impulse response functions of long-term interest

rates and equity prices, we estimate that 10-year bond yields would have been 50 basis points higher without the APP, while the Euro Stoxx 50 index would have been approximately 13% lower. The findings on the impact on long-term interest rates are in line with the evidence found in Altavilla et al. (2015) which suggests that the APP lowered long-term bond yields by 30–50 basis points at 10-year maturity. In turn, the estimates of the impact on equity prices are very similar to Wieladek and Garcia Pascual (2016), also showing that equity prices increase by approximately 1% in response to 1% asset purchase announcement shock as a fraction of annualized 2014Q4 nominal GDP.

To check the robustness and compare the results with the findings from Wieladek and Garcia Pascual (2016), we replace Industrial Production with Real GDP, and HICP with Core HICP.

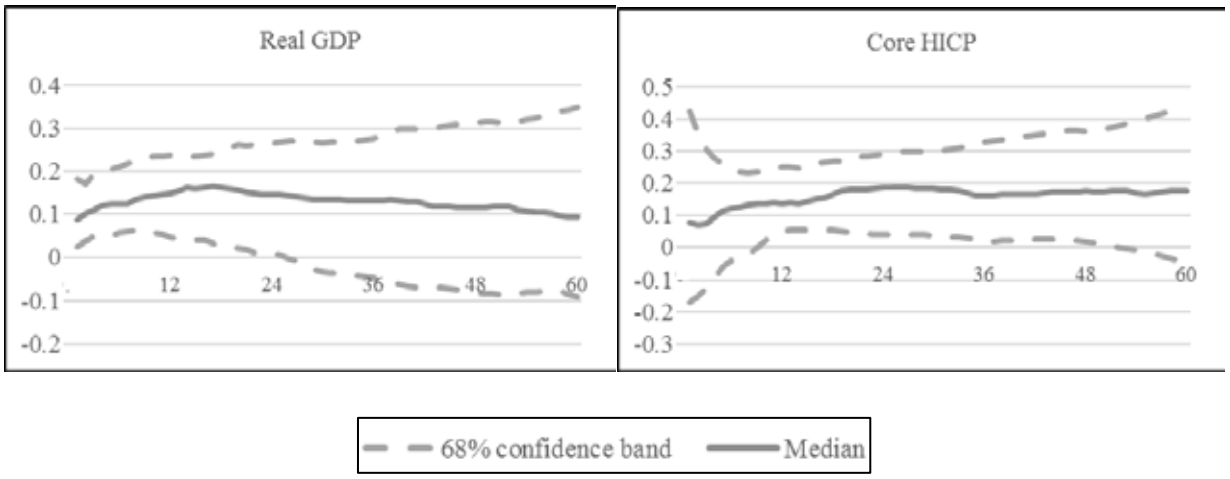

Fig. 3. **Results for the model with alternative output and price level measures**

Figure 3 demonstrates that the results from the standard model remain robust when alternative measures of output and price level are used. The impulse response function of the Real GDP shows that the level of output increases by 0.165% following a 1% increase in the Eurosystem asset holdings relative to nominal GDP. By scaling the impulse response function, it yields that the Real GDP would have been 1.82% lower in the absence of asset purchases. Likewise, when we use Core HICP as a price level indicator, the estimated impact of the QE on price level is identical – Core HICP rises by 0.19% in response to 1% asset purchase shock in terms of annualized 2014Q4 nominal GDP.

In order to examine whether our identification scheme is correct and we indeed measure the structural QE shock, we replace the scheme where QE shock is identified from a quantity variable with a more traditional scheme where asset purchase shock is identified as a reduction in the long-term bond spread. The summary of the alternative identification scheme is provided in Table 3. To identify QE shock as a compression in the long-term interest rate spread, we drop the quantity variable and include the short-term interest rate. This also prompts us to identify a conventional monetary policy shock so that disturbances in the long-term interest rate spread related to conventional monetary policy actions are not confused with quantitative easing

Table 3

Alternative identification scheme

Variable / **Shock**	Output	Price Level	10-Year Bond Yields	EONIA	Equity Prices
Aggregate Demand	+	+	+		
Aggregate Supply	+	-	+		
Monetary Policy	+	+	-	-	
QE	+	+	-	0	+

Next, we recover the structural asset purchase shock by restricting the long-term interest rate to decline and the short-term interest rate to stay unchanged to reflect the zero lower bound environment. All restrictions are imposed on impact only, exactly as per the first scheme.

Figure 4 shows the impulse response functions of the variables in response to asset purchase shock, identified as a 5-basis-point reduction in the long-term interest rate spread. The impulse response function of the Industrial Production is almost identical to the one obtained by using the standard identification scheme. Considering that the results from the standard model indicate that the APP lowered long-term bond yields by 50 basis points, we can scale the results from the model with the alternative identification scheme to conclude that the Industrial Production would have been approximately 2.5% lower without such a programme, which is an almost identical estimate to the one from the standard model. Turning to price level, the impulse response function of the HICP is also very similar in shape to the one from the standard identification scheme; however, the estimated magnitude of the impact is slightly smaller – price level would have been 1.2% lower without QE. This demonstrates that modeling the QE shock as a compression in the long-term interest rate spread only allows effects transmitted through the portfolio rebalancing channel to be captured. However, the next section suggests that the APP is also operating through other channels, not just portfolio rebalancing.

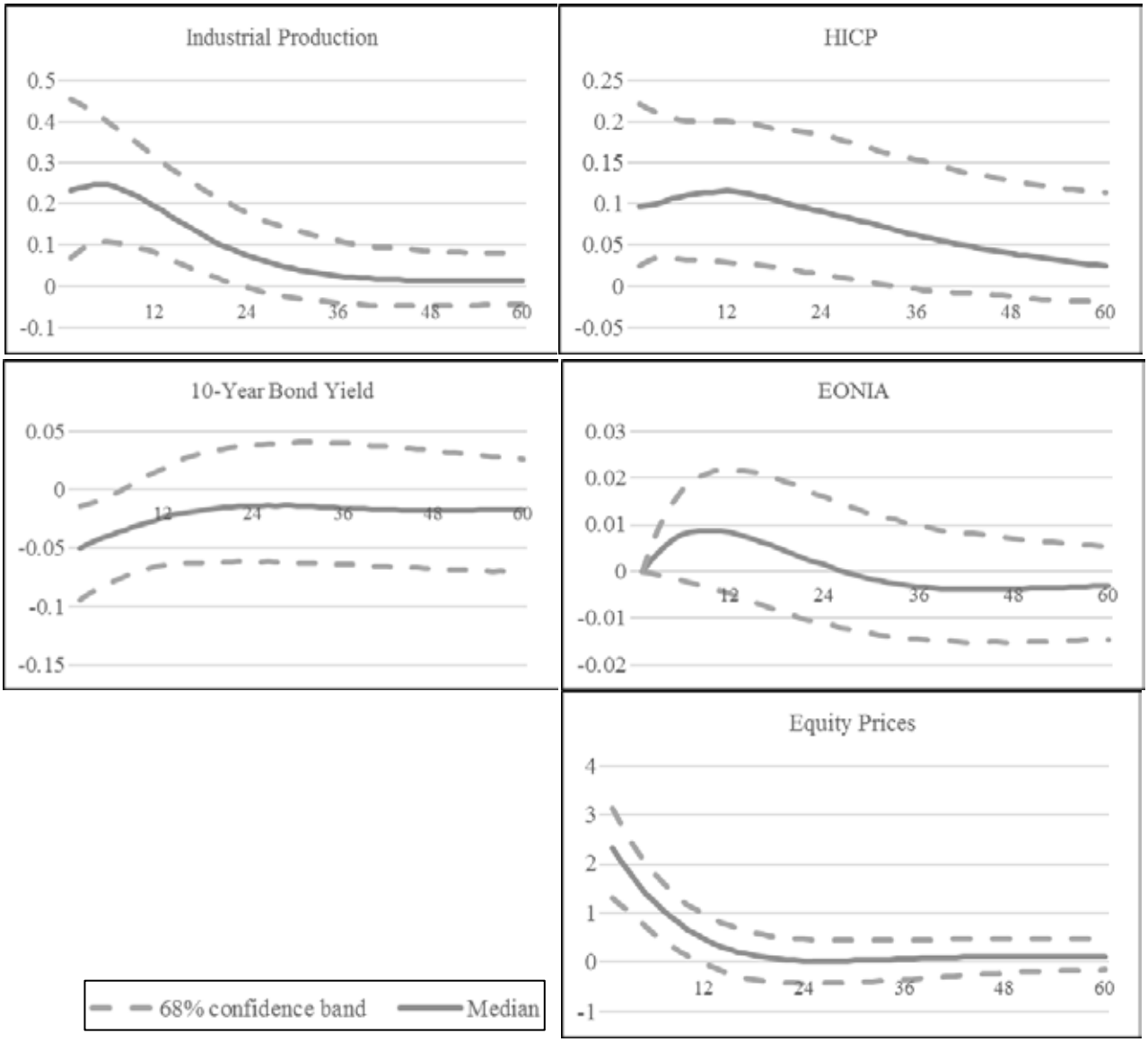

Fig. 4. **Results for the model with the alternative identification scheme**

3. Transmission Mechanism

The theory of quantitative easing has outlined several transmission channels; most notably, portfolio rebalancing and signaling. But it has also been found that asset purchases lower the value of the exchange rate, reduce uncertainty in financial markets and ease borrowing conditions. We start by analysing the portfolio rebalancing channel. To test for the existence of this channel, we add 20- and 30-year bond yields to the standard model. Theoretically, the asset purchases by the central bank should provoke investors to buy longer-term, higher-risk assets to compensate for the fall in the return of their portfolios. Thus, 20- and 30-year government bond yields should decline following the QE shock. Figure 5 does indeed show that portfolio rebalancing is active in the case of the APP as long-term interest rates decline and the reaction is statistically significant.

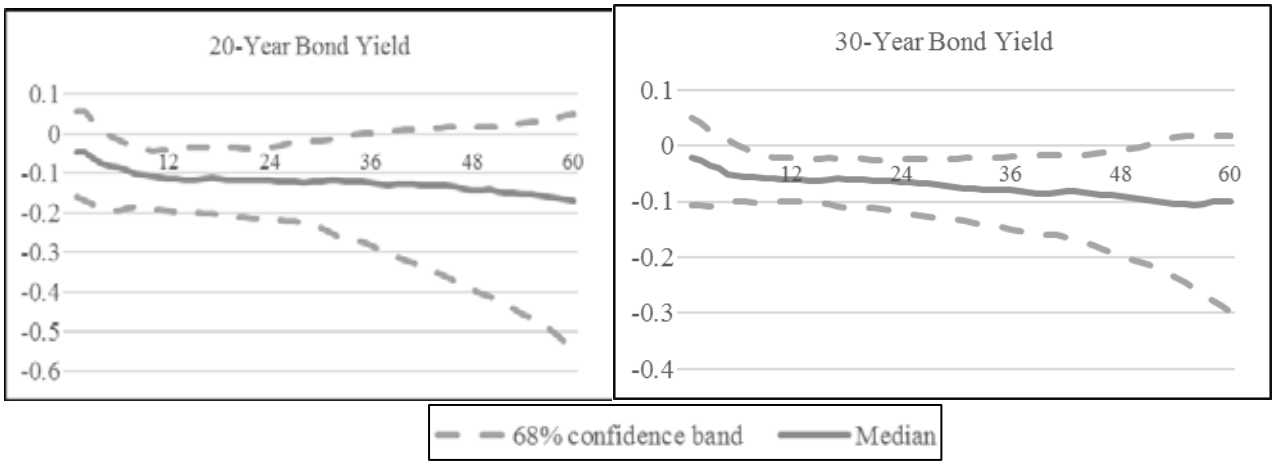

Fig. 5. **Results for the portfolio rebalancing channel**

The evidence from the model with the alternative identification scheme indicates that this might be the most important transmission channel because the estimates are very close to the results from the standard model with the more agnostic identification scheme.

We now turn to the signaling channel, which suggests that, when a central bank switches to unconventional monetary policy measures, it signals that inflation and output are far from their desired levels, meaning that short-term interest rates will stay low for a prolonged period. If this channel operates, then the forward curve should shift downwards because financial markets are expecting lower short-term interest rates. However, as Wieladek and Garcia Pascual (2016) note, forward interest rates would also decline if the spot rate went down, but it would not indicate the existence of a signaling channel. Therefore, we take the spread between the one-year forward rate, which shows the expected short-term interest rate one year ahead, and the spot short-term interest rate, which is proxied by EONIA.

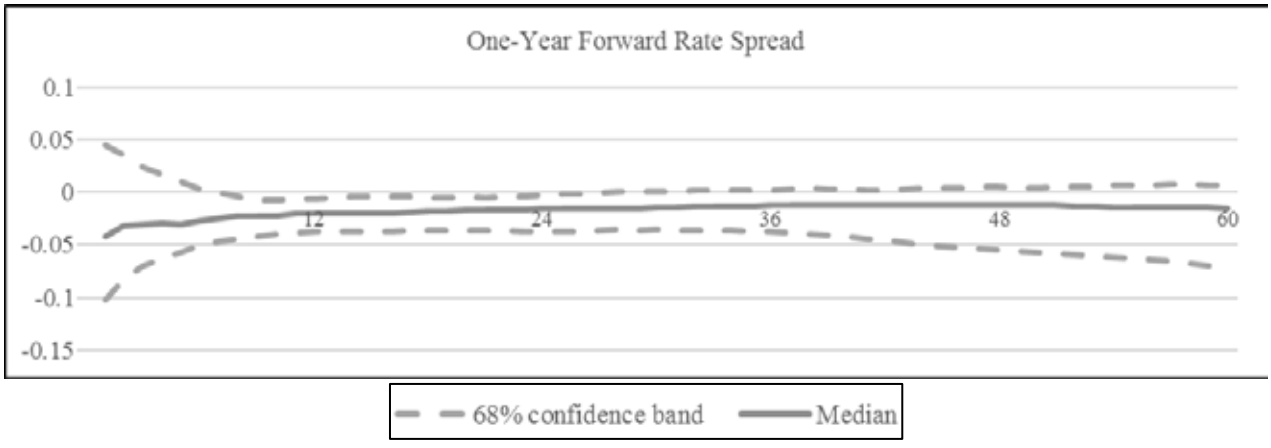

Fig. 6. **Results for the signaling channel**

The impulse response function of the one-year forward rate spread in Figure 6 shows that the APP did lower the short-term interest rate expectations, however the impact, while statistically significant, seems to be rather small.

In a similar manner to the signaling channel, the uncertainty channel of quantitative easing also works by shaping the expectations of financial market participants. By embarking on asset purchases, the central bank demonstrates that it is deploying all measures to bring price level and output closer to their targets. As the uncertainty about the macroeconomic outlook decreases, volatility in the financial markets also subsides. Weale and Wieladek (2016) show that the US and UK quantitative easing policies had a significant effect on the real economy by reducing the uncertainty. The impulse response functions of the Euro Stoxx 50 volatility index and the Composite Indicator of Systemic Stress reported in Figure 7 show that the response has the expected sign, however it is statistically insignificant throughout the horizon. We believe that the uncertainty channel does not operate in the euro area because the financial stress levels are low during the implementation of the APP in comparison with the time when the US and the UK implemented their asset purchase programmes. It is worth noting here that the literature, which focuses on assessing the effectiveness of QE in these economies, emphasizes that asset purchases are more effective when the financial stress is high (for example, see Haldane et al. 2016). However, when comparing our estimates with Baumeister and Benati (2010), Kapetanios et al. (2012) and Weale and Wieladek (2016), we conclude that the QE in the euro area is as effective as in the US and the UK. It suggests that quantitative easing is not as state-dependent as previously reported in the literature. Altavilla et al. (2015) arrive at similar conclusions when evaluating the impact of the APP on financial markets, stating that, while low levels of stress in the financial markets have indeed weakened certain transmission channels, other channels become more prominent. Our evidence demonstrates that this is also the case with the real effects of asset purchases.

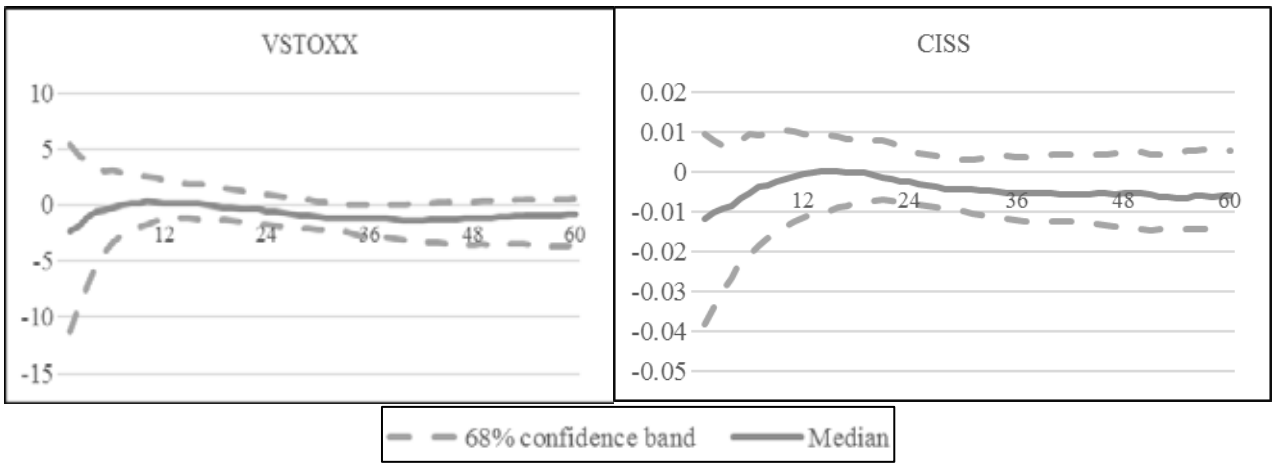

Fig. 7. **Results for the uncertainty channel**

Next, we examine the APP impact on credit easing. The theory of quantitative easing argues that asset purchases should lower borrowing costs because new deposits are created in the process and the banking system receives extra liquidity. Testing for the presence of this channel is particularly important in the euro area, because, as its financial system is mainly bank-based, the effectiveness of the transmission is related to the ability of banking system to pass on monetary impulses to the real economy (Praet, 2016). The results for the credit easing channel, presented in Figure 8, show that the banking system did indeed transmit the effects of the APP, as interest rates for both households and enterprises decline after the QE shock. At the same time, the effect seems rather muted as borrowing costs decline by about 40–50 basis points. This might reflect that the scope for further reduction in borrowing costs by the APP was limited due to already low money market interest rates and additional liquidity provided by TLTRO.

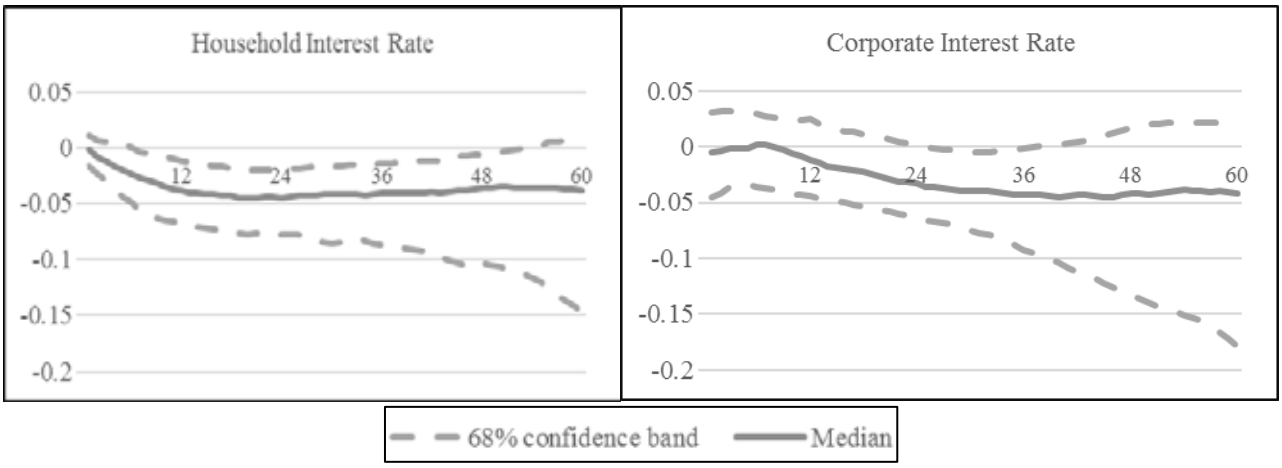

Fig. 8. **Results for the credit easing channel**

Finally, quantitative easing should lower the value of a currency due to capital outflow as the domestic yields decline relative to foreign assets. A lower exchange rate stimulates the economy, as export competitiveness increases and imports decline due to higher prices for foreign goods. The results reported in Figure 9 show that both the EUR/USD exchange rate and the nominal effective exchange rate significantly depreciate in response to the APP. The peak impact occurs in the first months after the shock when the euro depreciates by approximately 10% relative to the US dollar, while the NEER displays a somewhat smaller but still very significant effect at ~7%. These results, taken together with the impulse response functions from the standard model and the model with the alternative identification scheme that implies the existence of the portfolio rebalancing channel, urge us to think that the lower exchange rate did not lead to export-driven growth because the estimated impact on output in both schemes is almost identical. However, the higher estimated impact on price level from the standard model suggests that price level was boosted by higher import prices due to depreciation of the euro.

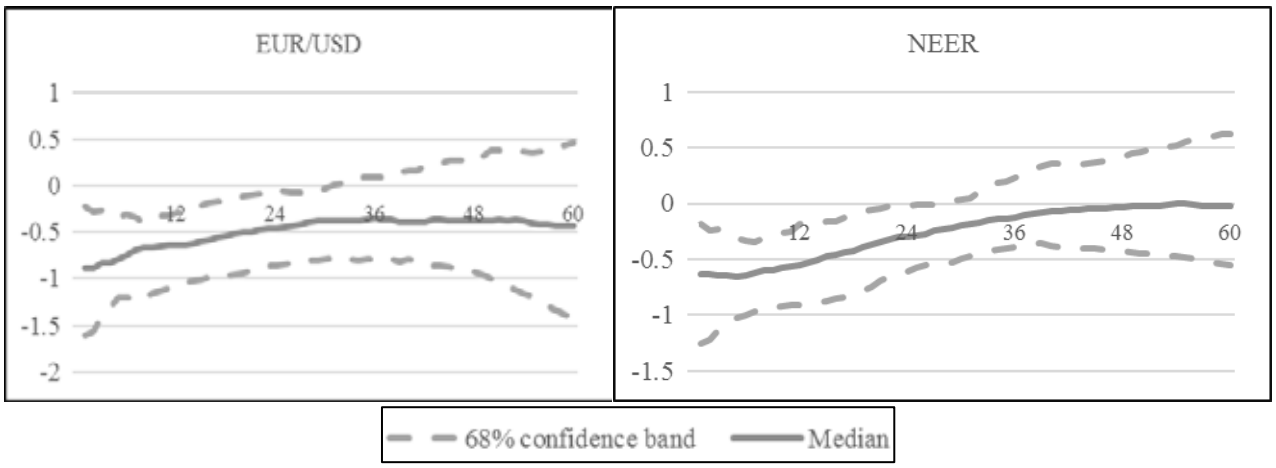

Fig. 9. **Results for the exchange rate channel**

Conclusions

Our findings suggest that the APP has had a significant positive impact on the euro area economy, as we estimate that output and price level would have been 1.8–2.6% and 2.1% lower respectively in the absence of asset purchases. The results show that the programme is mainly transmitted to the real economy through the portfolio rebalancing and exchange rate channels, while the signaling and credit easing channels also display smaller but still statistically significant responses, aiding the transmission. However, we do not find that the uncertainty channel is present, in contrast to the US and UK asset purchase programmes. We argue that this is due to low levels of financial stress during the implementation

of the APP. In addition, we show that quantitative easing can be an effective measure for increasing output and price level even when financial stress is low. This contradicts the literature which states that asset purchases can only be effective when financial market volatility is high. Our results complement the findings of Altavilla et al. (2015) on the APP impact on financial markets, showing that, while low financial stress has indeed weakened certain transmission channels, other channels become more prominent. We show that this is also true for the macroeconomic impact of the APP.

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ENRICHMENT OF FULL TEXT RESOURCES BY ADDING USER-DEFINED ANNOTATIONS

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Abstract. There is an ever growing amount of text documents created and made available online. Efficient analysis of information stored in these documents can have great benefits to any organisation that holds a substantial amount of text documents: both digital and analogue. Using computerised methods such as data mining, natural language processing and full text search one can recognize patterns and regularities that would not be obvious otherwise.

One method of improving text analysis is adding structured annotations to text documents. Previous research has primarily concentrated on automatic recognition of named entities for fixed number of annotation classes. Although this provides quick identification of typical elements such as Persons, Organizations, Places, Dates and Numbers it also has its drawbacks. In many cases a manual reviewing of automatically generated annotations is still necessary and there is only a limited number of annotation classes available.

In our research we use a different approach by letting data operators define any annotation classes that are necessary for their particular task and by introducing an Entity database that helps data operators to uniquely identify objects mentioned in text documents and to record any additional information about these objects. Besides typical object reference annotations we also propose structural and composite annotations.

We also propose an annotation storage format based on well-established W3C standards that will improve data interchangeability between different systems.

Key words: *data collection and analysis, digital economy, text annotation, text enrichment, Linked Data,*

JEL code: C88

Introduction

Most institutions nowadays have migrated their circulation of paper documents to digital environment. Digital text documents are often stored in indexed databases for obvious reasons: documents can be organized, searched and accessed in a shared environment. However, digital documents also provide access to data mining and digital humanities text processing methods that allow discovery of information patterns and extraction of new knowledge that would be impossible to recognize by simply analysing individual text documents.

One of the ways to improve document analysis is to identify facts and objects mentioned in the documents. There has been substantial amount of previous research done into Named Entity Recognition solutions that mark up objects of pre-specified type in natural language text documents (Atdağ, S., Vincent Labatut, 2013). Most of the current tools can be trained to recognize from 3 to 10 typical types of objects: Persons, Organizations, Places, Dates, etc. However, users may need to mark up additional types of objects that are specific to a particular collection of text documents. A biology researcher, for example, might be interested to mark up mentions of Plants, Insects, Mammals and Fish in their biology research documents. Additionally, it is often necessary to uniquely identify the objects mentioned regardless of the literal

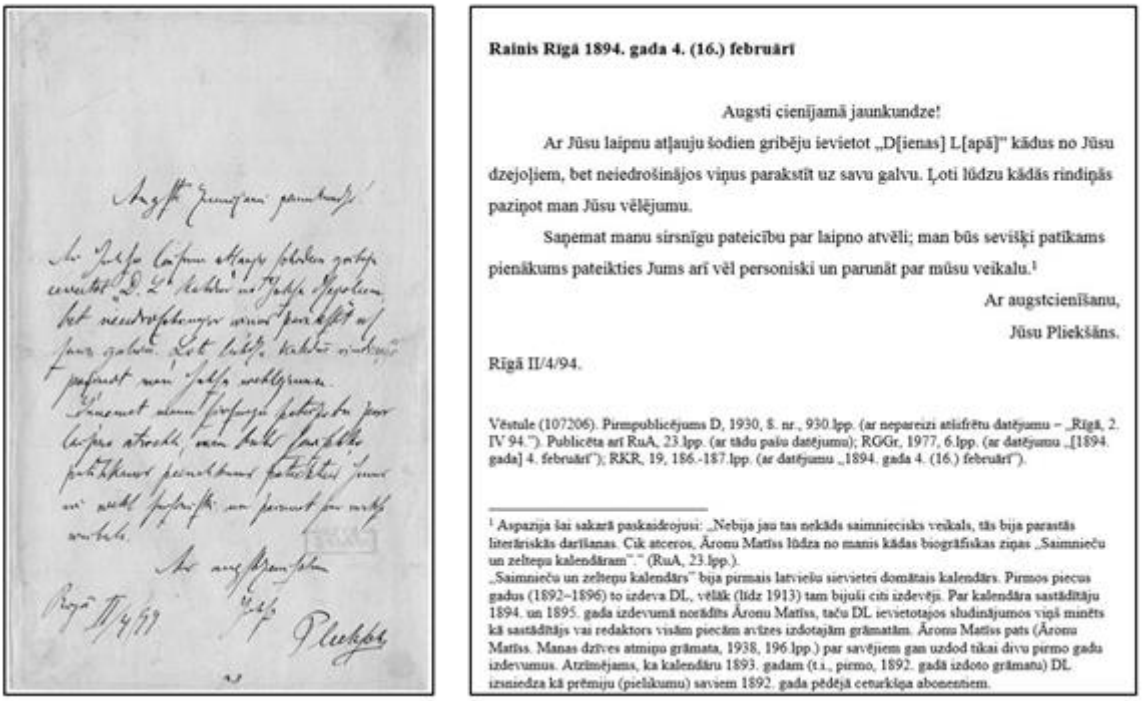
form used to refer to them in the text. For example, names of a tree in English and in Latin might still reference the same exact plant.

Our research aims to create a universal text annotation solution that lets users create their own annotation classes and uniquely identify objects by referencing entities in a central Entity database. As a proof-of-concept we have selected two datasets – two full-text document collections from cultural heritage field provided by National Library of Latvia – and identified annotation requirements for these datasets. A web-based annotation tool is under development that will support these annotation requirements in a shared environment. We also propose a possible data format for storing annotations based on the W3C Web Annotation Data Model (W3C, 2017).

Text Annotation Requirements

The research was initiated by analysing two datasets at the National Library of Latvia (NLL):

1. Correspondence (letters) from late 19th century between two of the most famous Latvian poets: Rainis and Aspazija. Letters were available both as images (scanned hand-written text) and as digitally born transcripts with additional comments by literature experts (Fig 1).



Rainis Rīgā 1894. gada 4. (16.) februārī

Augsti cienījamā jaunkundze!

Ar Jūsu laipnu atļauju šodien gribēju ievietot „D[ienas] L[apā]" kādus no Jūsu dzejoļiem, bet neiedrošinājos viņus parakstīt uz savu galvu. Ļoti lūdzu kādās rindiņās paziņot man Jūsu vēlējumu.

Saņemat manu sirsnīgu pateicību par laipno atvēli; man būs sevišķi patīkams pienākums pateikties Jums arī vēl personiski un parunāt par mūsu veikalu.[1]

Ar augstcienīšanu,

Jūsu Pliekšāns.

Rīgā II/4/94.

Vēstule (107206). Pirmpublicējums D, 1930, 8. nr., 930.lpp. (ar nepareizi atšifrētu datējumu – „Rīgā, 2. IV 94."). Publicēta arī RuA, 23.lpp. (ar tādu pašu datējumu); RGGr, 1977, 6.lpp. (ar datējumu „[1894. gada] 4. februārī"); RKR, 19, 186.-187.lpp. (ar datējumu „1894. gada 4. (16.) februārī").

[1] Aspazija šai sakarā paskaidrojusi: „Nebija jau tas nekāds saimniecisks veikals, tās bija parastās literāriskās darīšanas. Cik atceros, Āronu Matīss lūdza no manis kādas biogrāfiskas ziņas „Saimnieču un zeltepu kalendāram"." (RuA, 23.lpp.).
„Saimnieču un zeltepu kalendārs" bija pirmais latviešu sievietei domātais kalendārs. Pirmos piecus gadus (1892–1896) to izdeva DL, vēlāk (līdz 1913) tam bijuši citi izdevēji. Par kalendāra sastādītāju 1894. un 1895. gada izdevumā norādīts Āronu Matīss, taču DL ievietotajos sludinājumos viņš minēts kā sastādītājs vai redaktors visām piecām avīzes izdotajām grāmatām. Āronu Matīss pats (Āronu Matīss. Manas dzīves atmiņu grāmata, 1938, 196.lpp.) par savējiem gan uzdod tikai divu pirmo gadu izdevumus. Atzīmējams, ka kalendāru 1893. gadam (t.s., pirmo, 1892. gadā izdoto grāmatu) DL. izsniedza kā prēmiju (pielikumu) savsem 1892. gada pēdējā ceturkšņa abonentiem.

Fig 1 **Same letter available as an image (left) and as a digitally-born transcript with expert comments (right).**

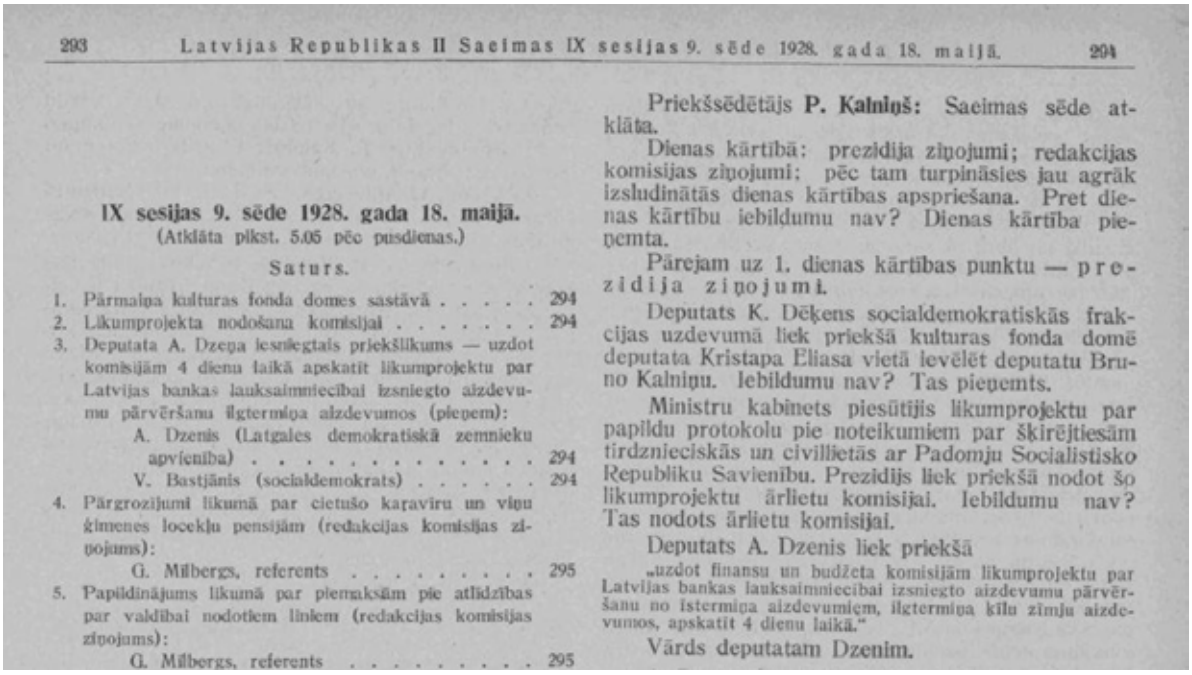
These letters contain many references to persons, places, dates, literary works and other entities. Most of these can be uniquely identified and linked to authoritative data. The letters have already been extensively analysed as individual documents, but not as a whole document collection. This presents a possibility to discover new, previously unknown facts about both the poets themselves and about other objects mentioned.

A pilot project – Linked Digital Collection "Rainis and Aspazija 150" – was created as a first step towards exploring how this material could be enriched and explored using text annotations. Poets' correspondence was annotated with

references to the entities mentioned in the letters resulting in a network of links between these entities and letters (Bojārs, 2016). The pilot project can be found online at http://runa.lnb.lv [*].

The pilot project highlighted issues with current annotation approaches and tools, and acted as valuable input for the text annotation requirements described in this paper.

2. Parliamentary transcripts document the first four parliamentary terms in Latvian history (1922-1934). Transcripts were available at NLL as paper documents (Fig 2), that were scanned and OCRed (National Library of Latvia, 2017). OCR was performed at a relatively high quality with at least 95% characters recognized correctly, although some errors and some out-dated orthography still exists in the documents. Transcripts are organized in such a way that each parliamentary session is represented in a separate chapter that begins with a table of contents for that particular session and is then followed by the session transcript. Each speaker is usually identified by name followed by party affiliation or role in that particular case. Transcripts also include mentions of activities like interjections or remarks. Transcripts are particularly rich in mentions of persons, places, legal acts, organizations, etc.



293 Latvijas Republikas II Saeimas IX sesijas 9. sēde 1928. gada 18. maijā. 294

IX sesijas 9. sēde 1928. gada 18. maijā.
(Atklāta plkst. 5.05 pēc pusdienas.)

Saturs.

Priekšsēdētājs **P. Kalniņš:** Saeimas sēde atklāta.

Dienas kārtībā: prezidija ziņojumi; redakcijas komisijas ziņojumi; pēc tam turpināsies jau agrāk izsludinātās dienas kārtības apspriešana. Pret dienas kārtību iebildumu nav? Dienas kārtība pieņemta.

Pārejam uz 1. dienas kārtības punktu — prezidija ziņojumi.

Deputats K. Dēķens socialdemokratiskās frakcijas uzdevumā liek priekšā kulturas fonda domē deputata Kristapa Eliasa vietā ievēlēt deputatu Bruno Kalniņu. Iebildumu nav? Tas pieņemts.

Ministru kabinets piesūtījis likumprojektu par papildu protokolu pie noteikumiem par šķirējtiesām tirdzniecīskās un civillietās ar Padomju Socialistisko Republiku Savienību. Prezidijs liek priekšā nodot šo likumprojektu ārlietu komisijai. Iebildumu nav? Tas nodots ārlietu komisijai.

Deputats A. Dzenis liek priekšā

„uzdot finansu un budžeta komisijām likumprojektu par Latvijas bankas lauksaimniecībai izsniegto aizdevumu pārvēršanu no īstermiņa aizdevumiem, ilgtermiņa kīlu zīmju aizdevumos, apskatīt 4 dienu laikā."

Vārds deputatam Dzenim.

Fig 2 **Part of parliamentary transcript with table of contents (left) and actual transcript (right).**

1. Requirements of text document annotation process

Both datasets were analysed to identify what kind of annotations would create most added value to the already existing text and what functionality could then be created beyond simple keyword search. The following requirements of the annotation process and a hypothetical annotation tool were identified:

- *Standard annotation classes must be available*. One might consider all standard NER classes like Persons, Places, Organizations, Dates, etc. Availability of built-in annotation classes means that their recognition might be automated later using existing NER tools (Manning, C. D., et. al., 2014).
- *Users must be able to define new annotation classes.* Besides the standard NER classes it is often necessary to identify non-standard objects like, for example, Committees or Parties in parliamentary transcripts.

[*] For example, annotated version of the letter mentioned above can be found at http://runa.lnb.lv/60316/.

- *Annotations can have additional technical metadata*. It might be important to identify, who and when created the annotation, what's the visibility of the annotation, etc.
- *Annotations can have properties.* Because the same object can be mentioned in the text many times in different contexts, it can be important to identify the context for each annotation in its properties. For example, the same person might be representing two different parties in the entire collection of parliamentary transcripts. The party affiliation in this case might be considered property of Person annotation class.
- *Several users can create annotations in the same document.* The larger the collection of text documents, the greater a probability that several users will be involved in an annotation process. This in turn means that actions of different users must be monitored so that not to create contradictory annotations.
- *There can be private and public annotations.* A user might want to add their own annotations that are not necessarily required for the general purpose of annotating the particular text collection.
- *Annotations can be multi-lingual.* Although usually the text that is annotated is written in one language a translated form of the identified object might be added to the annotation to make the text more usable in several different languages.
- *All elements of the annotation should be identified with a URI.* The annotation itself, the annotation class and the object mentioned all must be identified with a globally unique URI, which is one of key requirements to make the data available as Linked Open Data.
- *Annotations must be represented in a visually distinguishable form.* To ease the review process of annotated text annotations of different classes should be easily visually distinguished. A typical solution is to assign different colours to different annotation classes.
- *Annotations should be identified by linking them to globally unique entities.* One way to achieve this would be to create an Entity database that would store all unique entities that are mentioned in the texts.
- *Annotations can be imported/exported.* Although annotations can be implemented by storing all of their technical parameters in a database, for data interchange purposes, there should also be an open format to store, import and export annotations.
- *Annotations should have an addressing mechanism that is resilient to changes in the text.* Some texts can still be corrected even after the annotation process has already begun: misspelled words can be corrected, missing words might be added or parts of the text – deleted. In every case positions of all annotations in the text must be recalculated to still point to correct positions.
- *Annotations can consist of references to other annotations*. A typical example here would be an annotation of a class Vacation that would point to one Person annotation and two Date annotations (start and finish of a vacation).
- *Annotations can have trustworthiness probabilities.* A user might sometimes be unsure whether he has correctly identified the object, the annotation class or even the text boundaries of the annotation. Such probabilities have already been suggested in Text Encoding Initiative format (TEI Consortium, 2016).

In our research we identified several other requirements, but mentioned above are the ones that could influence the general architecture of the annotation tools.

Description of proposed annotation model and Entity database

Based on requirements from the previous chapter we propose the following general model of an annotation (Fig 3).

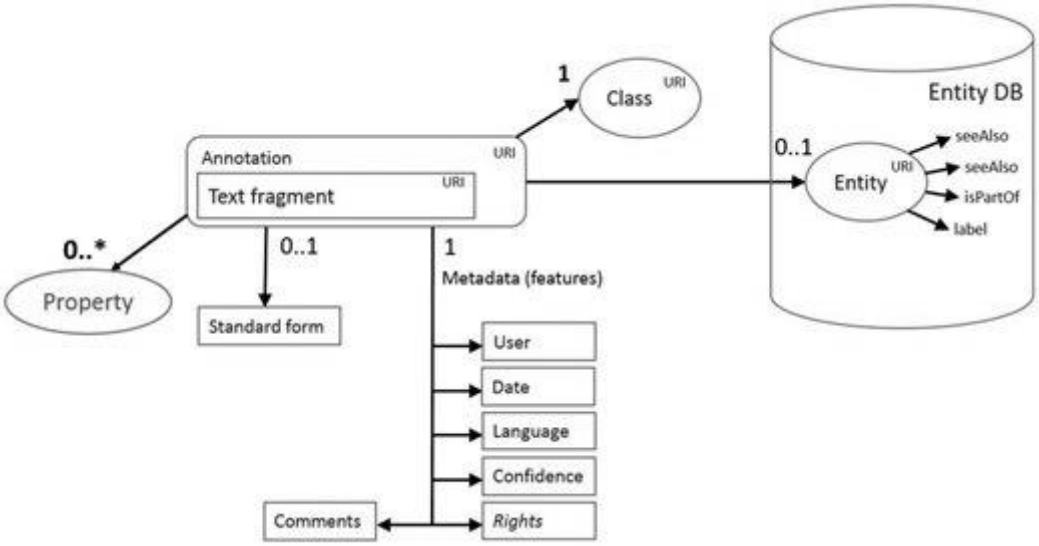


Fig 3 **A schema of a single annotation with a link to Entity database.**

A standard annotation thus consists of a text fragment associated with an annotation class, has several technical metadata and can be linked to a globally unique entity in an Entity database. Normally annotations will be linked to exactly one entity, however, there might be cases when objects can't be identified with 100% certainty. In that case annotation might omit a link to an entity until it is properly identified.

Entity database itself is not just a simple collection of entities, but can contain links between entities and entities can be organized in a hierarchical structure. For example, there might be a link between two Person class objects if the corresponding people are married. Likewise, there can be a hierarchical structure between different Place class objects if one place is entirely within another one (e. g., city and country).

We also propose to distinguish between *annotation class* and *entity class*. *Entity class* should usually be more general. For example, typical entity classes might be: Person, Place, Organization, etc. *Annotation classes* can be specific to every use case and can represent a higher level of detail. For a document collection that contains references to a lot of different writers one might consider creating annotation classes for Poets, Fiction writers, Non-fiction writers, which would all reference entities of class Person in Entity database. Thus annotation class would usually reference a more general entity class. However, there can be cases where annotation class does not reference any one particular entity class. For example, annotation class Creator might reference both a Person class and an Organization class entities.

Finally we propose to have three types of annotations:

- **Object annotations**. Most of the annotations would be of this type and they describe an object or a fact that in most cases will be represented by a single entity in Entity database.
- **Structural annotations**. Sometimes it is important to mark up a fragment of a text document that has a special meaning within a context of that document. There might be quotes, comments, remarks, direct speeches, etc., that don't have a corresponding entity, but could improve post-processing of a text, by showing that, for example, an object is mentioned in a specific part of a document.

- **Composite annotations**. A combination of several annotations can sometimes be an annotation itself. For example, an annotation of class Business trip might reference an annotations of classes: Person, Date and Place.

Annotation Format

After a text document collection has been annotated information about annotations could be shared with other third party systems. In order to achieve this an annotation representation format must be established. The format should concern both syntax and semantics. Because annotation information is more likely to be shared on the Web, syntax should be XML, JSON, plain text or some other widely recognized and open format.

None of existing data structure formats cover every aspect of semantics of our proposed annotation model. However, we consider a format proposed by W3C Web Annotation Group (W3C Recommendation, 2017). This format uses JSON for syntax and is extensible so that we could include annotation features originally lacking in Web Annotation Data Model (WADM).

The following sample text includes a mention of one Person object (annotation {1}) and two Organization objects (annotations {2} and {3}).

> Priekšsēdētājs **Fr. Vesmanis**{1}: Saeimas{2} sēde atklāta. Dienas kārtībā: prezidija ziņojumi; redakcijas komisijas ziņojums; likums par cietušo karavīru un viņu ģimenes locekļu pensijām, 3. lasījums; likums par politisko apsardzi, 3. lasījums; Latvijas mākslas akadēmijas{3} satversme, 3. lasījums; preses likums, 3. lasījums. Tālāk turpināsies agrāk izziņotā, vēl neizspriestā dienas kārtība, papildināta ar likumu par jūras krastu aizsardzības līdzekļu iegādi un likumu ar kara klausības likuma 35. panta 2. punkta pārgrozījumu.

In this example all objects can be uniquely identified and linked to corresponding entities. For example, "Fr. Veismanis" mentioned in annotation {1} is a Person - *Frīdrihs Vesmanis (15.04.1875-07.12.1941.)*, which can be further identified by linking to an entry in VIAF database (OCLC, 2016). The WADM representation of this annotation would be:

```
{
  "@context": "http://www.w3.org/ns/anno.jsonld",
  "id": "http://lndb.lv/SS/doc_s01/anno01",
  "type": ["Annotation","ObjectAnnotation"],
  "annotation_class": "Person",
  "body": {
    "type": "SpecificResource",
    "source": "http://lndb.lv/entity/Fridrihs_Vesmanis",
    "purpose": "identifying"
  },
  "target": {
    "source": "http://lndb.lv/SS/doc_s01",
    "selector": {
      "type": "TextPositionSelector",
      "start": 15,
```

```
        "end": 27
      }
    }
}
```

Here *target* element describes the annotation itself and text fragment that was marked up, while *body* element describes the entity this annotation links to.

Notice that text fragment in target element is identified by starting and ending positions as character counts from the beginning of the text. This poses a risk of keeping annotations pointing to the correct position in text if changes to text are allowed. One solution would be to monitor every change done to the text and recalculating annotation positions after every change. However, it is not always clear how to maintain the exact extent of the annotation. For example, if the changes are done within annotation itself and some characters are added or deleted. It's not clear whether the length of annotation should also be changed. Other option is to use several independent addressing mechanisms and if one fails, others might still point to correct positions. Besides using character counts to identify extent of annotation, WADM also supports position identification by using prefix and suffix of the annotation – text fragments right before and after annotation in question.

The following extensions can be suggested to WADM format in order to support annotation requirements specified in this research:

- Element *type* should have one or more values of which one must be "Annotation". We propose to add and use additional values: "ObjectAnnotation", "StructuralAnnotation" and "CompositeAnnotation".
- Several *selector* elements within a *target* element should be used so that if one becomes corrupted, other types of selectors would still point to the correct position in the text.
- A new element *annotationClass* should be introduced to represent the annotation classes of the marked up text.
- Composite annotations should refer to the nested annotations within a *body* element, by introducing a new element *attributes* as shown below:

```
{
  "id": "http://lndb.lv/SS/doc_s02/anno_complex01",
  "type": ["Annotation", "CompositeAnnotation"],
  "annotation_class": "Vacation",
  "body": {
    "type": "CompositeAnnotationBody",
    "attributes" : {
       "person": "http://lndb.lv/SS/doc_s02/anno01",
       "date_start": "http://lndb.lv/SS/doc_s02/anno02",
       "date_end": "http://lndb.lv/SS/doc_s02/anno03"
    },
    "purpose": "describing"
} …
```

- Element *attributes* within element *body* could also be used for object annotations and structural annotations to provide some additional information about the annotation.
- Element *probability* should be added with three possible uses: a.) if used at the root level, *probability* represents the confidence level of whether the correct annotation class has been chosen; b.) if used within *body* element, *probability* represents whether annotation has been linked to the correct entity; c.) if used within *target* element, *probability* represents whether the correct text fragment has been marked up.

Other improvements to WADM might become necessary as more text documents would be analysed.

Conclusions

We have provided a set of requirements and a general model for a universal text annotation system that would let users annotate text documents using their own annotation classes. This is an extension of existing Named Entity Recognition solutions that typically only have built-in annotation classes and concentrate on automatic entity recognition. A central role in this research is played by Entity database that lets not only to mark up text, but also uniquely identify objects and facts mentioned in the text.

Annotations can be of three types: object, structural and composite, where structural annotations contain a part of text with specific meaning in the context of the whole document and composite annotations can refer to several other annotations creating a new annotation.

Although the requirements and annotation model was created by analysing text document collections with cultural or historical meaning, the proposed solution is universal enough to be used in almost every other field that deals with text documents: science papers, articles in news portals, technical documentation, court proceedings, etc.

Currently a web based annotation tool is under development that will support the annotation model proposed in this research. Two data sets will be uploaded, annotated and analysed using this tool. Our aim is to demonstrate new possibilities of analysing text documents that are only available after careful annotation.

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USING DATA MINING TECHNOLOGY FOR STUDENT DATA ANALYSIS

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Abstract. The collected large amount of the student data in educational information systems is the informational basis for using of data mining technologies in the education sector. Thanks to predictive modelling, the data mining technologies can help the university to find out the students who are deemed to be prone to dropout. This will make the more favorable conditions for having the more focused work with students in order to keep them in the university lists and identify the factors which make students decide to leave the university.

The aim of this research is to create a model for predicting the dropout of students because of problems with academic performance based on the collected data for each student using methods of data mining technologies.

The subject of the study is university student's performance. The collected sample contains data about students, which study in university within different study programs, graduated from university or dropped out from university. The data have been collected over the period from 2011 to 2016. The collected data regard the student's study history: the student level of previous education, student average point for previous education, the region and the type of school that the student have graduated from, the study programs in university, the student average grade in university, the type of studies in university: full or part-time as well as other information.

In paper there is discussed the application of different classification algorithms in order to create the student's dropout predictive model.

Key words: *Analytics, Data Mining, Education Data Mining*, *Predictive Modelling*

JEL code: M15, M53.

Introduction

Competition is growing among higher education institutions. On the one hand, it is due to a large number of higher education institutions, on the other hand, it can be explained by a decrease in the population and, in particular, the proportion of young people aged 18-35. Therefore, nowadays for each education institution, the task of reducing the number of students with poor academic performance and students who dropped out for other reasons, is more relevant than ever. Early identification of students with a large potential risk of falling out can help to develop and implement the preventive measures to delay the students in advance. Currently, retention of students is one of the indicators of the quality work and reducing the number of the expelled students from budgetary places is one of the key tasks for an educational institution.

The task of retaining students is not new, and different studies are devoted to this. As early as 1975, Vincent Tinto analyzed different factors influencing the student's decision to leave the school (Tinto Vincent, 1975).

At present, in each educational institution there are used various information systems where the student's educational activities are recorded. As a result, a large amount of data has been accumulated in the educational information systems,

which makes it possible to apply data mining technologies in the field of education. In the scientific literature, this approach was called Education Data Mining (EDM).

Formulating the Problem

The aim of the research is to create a model for predicting the dropout of students using the methods of data mining technologies as well as to analyze the approaches to the use of predictive analytics techniques for student data analysis. The model is based on student historical data that is accumulated in *Student Record System* of University. The dropout predictive model can help to identify students who are prone to dropout due to their poor academic performance. It can improve the quality of monitoring students and allows to carry out the more focused work with students prone to drop out, and it can influence the reduction in the number of students who have decided to leave the university or are expelled from the university because of their poor academic performance.

Related Work

The task of predicting dropout is one of the areas where the Education Data Mining technology can be applied. The main areas of EDM application are: "*data analysis, data visualization; predicting student performance; grouping students; enrolment management*" (Namratha & Sharma, 2016).

The task of predicting student performance includes forecasting of student knowledge and students‘ marks in various academic subjects. To solve this task the following techniques and models are applied: "*neural networks, Bayesian networks, rule based systems, regression, and correlation analysis"* (Namratha & Sharma, 2016).

The task of grouping students involves the creation of groups of students based on students' "*customized features and personal characteristics*" (Namratha & Sharma, 2016). For grouping the students the classification and clustering algorithms are used, which are "*hierarchical agglomerative clustering, K-means and model-based clustering"* (Namratha & Sharma, 2016).

The task of enrollment management includes a set of activities aimed at increasing the number of students wishing to study at a particular educational institution. As a rule, it is the development of the marketing policy of admission of students and the retention program as well as consideration of providing the financial support for students, various scholarship allowances, the reduction of tuition fees, etc. (Namratha & Sharma, 2016).

In the research (Zhang, Oussena, Clark, & Kim, 2010) characterize 9 data sources for EDM : "*Student Record System; Online Learning System; Library System; Reading list as library system subsystem; Online Resource System; Programme Specification; Module Study Guide; Course Marketing System and Online Test System".*

(Ventura & Romero, 2016) combined the sources for EDM into the following 3 groups: "*data accumulated as a result of traditional education process, data from E-learning systems, and from learning management systems*."

(Shahiri, Husain, & Rashid, 2015) reviewed scientific publication and identified the important attributes that have been frequently used in predicting students' performance. There are: "*internal assessment*, *cumulative grade point average, students demographic, extra-curricular activities, high school background, social interaction network and psychometric factors*" (Shahiri, Husain, & Rashid, 2015).

In (Burgos et al., 2017) as the initial data there was used the information about the performance of each student in the various training courses from Moodle system. In the study (Zhang et al., 2010) uses data from various information systems that characterize student "*degree of academic and social integration*". As the more significant for dropout are indicated: "*average mark*, *online learning systems information, award, library information"*.

The study (Ventura & Romero, 2016) provides the following classification of the methods used Data Mining in Education there are: "p*rediction, clustering, relationship mining, distillation of data for human judgment, discovery"*.

The predictive model can be created on the basis of methods of classification, regression and clustering. This depends on the basis of the types of patterns of the initial data which the model has been built on (Ventura & Romero, 2016).

From the three, main data mining tasks: classification, regression and clustering (Shahiri, Husain, & Rashid, 2015), the noted classification as the most popular task to student performance prediction for the solution of which the researchers use the following algorithms: "*Decision tree, Artificial Neural Networks, Naive Bayes, K-Nearest Neighbor and Support Vector Machine"* (Shahiri, Husain, & Rashid, 2015).

In (Burgos et al., 2017) to create a predictive model for predicting and preventing dropout, the author used the logistic regression algorithm to classify new students into two classes: "dropout" or "non-dropout". For the model, the student marks have been used as independent variables. Two values: "dropout" and "non-dropout" have been used as dependent variable. (Burgos et al., 2017).

In (Zhang et al., 2010) the study of three algorithms of the model of student dropout creation have been used, which are: "*Naive Bayes, Support Vector Machine and Decision Tree"*. The model created on the basis of the Naive Bayes showed better forecasting accuracy (89.5%) as compared to the models built on the basis of other algorithms (Zhang et al., 2010).

In the study (Abu-Oda & El-Halees, 2015) these methods *Decision Tree*, *Naive Bayes* have been applied to create the two prediction models of students dropout. The analyzing sample have contained the students mark in each study course from the computer science. The authors succeeded in determining the courses on which results have a significant effect on predicting dropout. The created models have shown high accuracy of prediction 98.14% and 96.86% respectively (Abu-Oda & El-Halees, 2015).

Data Source and Predictive Model Creation

In the research two data mining tools have been used to create the model, and they are: predictive analytics platform - IBM SPSS Modeler and a cloud service Microsoft Azure Machine Learning with Microsoft Azure Machine Learning Studio - the special development tool for predictive modelling.

Within the research there have been analyzed the data from *Student Record System* of University which contain historical information about student enrollment, student study performance and activities in university as well as information about student previous education.

The initial collected sample contained the data on 5000 students, who study at the faculty of business, management and economics at the University within different study programs (*Economics, Financial Management, Business Administration, International Economics and Commercial Diplomacy*, *E-business and Logistics Management Systems*) and graduated from the university or were dropped out therefrom over the period of 2011–2016. After examination and preparation of the data, excluding the records with missing values, there was obtained the sample data containing 3487 records from which 643 records were about the students who dropped out due to their poor academic performance. Each record contained the following attributes for each student:

- the student level of previous education,
- the student average point for previous education,
- region, types and level of school that the student graduated from,
- study programs in university,
- student average grade in university,
- type of studies in university: full or part-time,
- gender,

- government-financed or self-finance,
- financial discount,
- whether the student lives in a hotel.

The predicted (dependent) variable "dropout" was assigned the values: "*yes*" – which means that the student dropped out because of poor academic performance, and "*no*" - student dropped out for the other reasons which are not specified and are not considered in this research. The analysis of the scientific literature shows that the classification is the most popular task of predicting students' performance. The predicted variable «dropout» has two values consequently, to solve the binary classification task, the following modelling algorithms are used: *Decision Tree, Neural Networks, Naive Bayesian, K-nearest Neighbor, Support Vector Machine, Logistics Regression*.

Model creation in Azure Machine Learning

As it is specified in Microsoft documentation, Microsoft Azure Machine Learning studio supports nine modelling algorithms for binary classification. They are *Two-class SVM, Two-class averaged perceptron, Two-class logistic regression, Two-class Bayes point machine, Two-class decision forest, Two-class boosted decision tree, Two-class decision jungle, Two-class locally deep SVM, Two-class neural network* (Microsoft Azure documentation, Machine Learning Modules).

In this study 9 models were created on the basis of the nine above-listed modeling algorithms. The above described 10 attributes which describe a student were used as independent variables. A comparative analysis of the predictive performance of the created models is presented in Table 1 and Fig. 1, Fig. 2, Fig. 3.

Table 1

Binary Classification Evaluation Results

Modelling algorithm	Accuracy	Recall	Precision	AUC	F1 score
Two-class SVM	0.824	0.046	0.714	0.690	0.086
Two-class averaged perceptron	0.828	0.124	0.614	0.757	0.206
Two-class logistic regression	0.831	0.083	0.818	0.757	0.150
Two-class Bayes point machine	0.824	0.041	0.750	0.733	0.078
Two-class decision forest	0.813	0.216	0.461	0.702	0.294
Two-class boosted decision tree	0.797	0.413	0.435	0.720	0.424
Two-class decision jungle	0.827	0.206	0.556	0.753	0.301
Two-class locally deep SVM	0.803	0.243	0.421	0.664	0.308
Two-class neural network	0.821	0.202	0.512	0.697	0.289

Source: author's calculations based on Azure Machine Learning Studio Evaluation Metrics of tested models

The models were evaluated according to the five metrics provided with the Microsoft Azure Machine Learning tool in order to evaluate models based on the binary classification (Microsoft Azure documentation, Evaluate performance, 2017). There are:

Accuracy is the proportion of correctly classified cases. ***Recall*** and ***Precision*** are calculated as:

$$Recall = \frac{TP}{TP+FN} \quad (1)$$ (Microsoft Azure documentation, Evaluate performance, 2017),

$$Precision = \frac{TP}{TP+FP} \quad (2)$$ (Microsoft Azure documentation, Evaluate performance, 2017),

where TP is the positive correctly classified cases, FN is the negative incorrectly classified cases and FP is the positive incorrectly classified cases. (Microsoft Azure documentation, Evaluate performance, 2017)

F1 Score is calculated as:

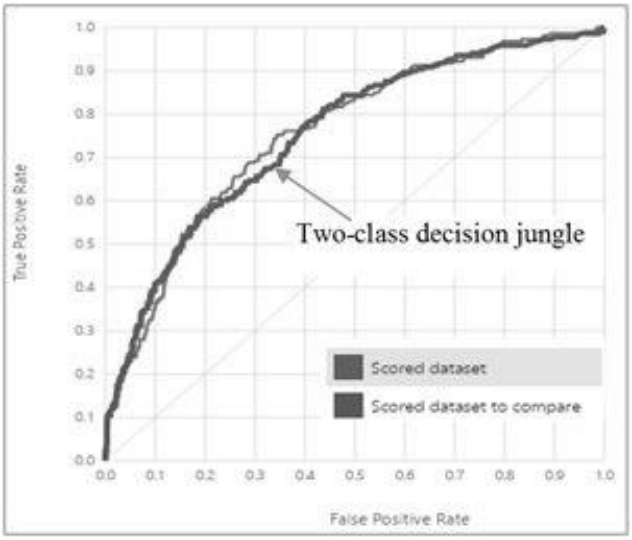
$$F1\ Score = \frac{2(Precision*Recall)}{Precision+Recall} \quad (3);$$ (Microsoft Azure documentation, Evaluate performance, 2017)

The ***Receiver Operating Curve*** (***ROC***) the rate of true positives to false positives cases (Microsoft Azure documentation, Evaluate performance, 2017);

The **Area Under Curve** (***AUC***) refers to "the amount of area under the ROC" (Microsoft Azure documentation, Evaluate performance, 2017).

The comparative analysis of created models showed that the models based on "*Two-class logistic regression*" (0.831), "*Two-class averaged perceptron*" (0.828) and "*Two-class decision jungle*" (0.827) algorithms had the best accuracy, which is above 0.83. At the same time, the model based on "*Two-class decision jungle*" algorithm has a higher F1 score (0.301).

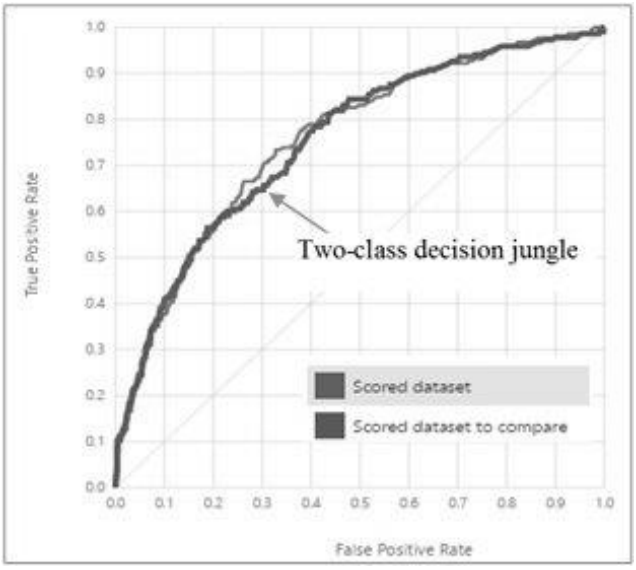
The following charts (Fig. 1., Fig. 2., Fig. 3.) displays the results from models testing using the Machine Learning algorithms "*the averaged perceptron*", "*logistic regression*", "*decision jungle*", which happen to be the most accurate among the nine models.



Source: author's calculations based on Azure Machine Learning Studio tool

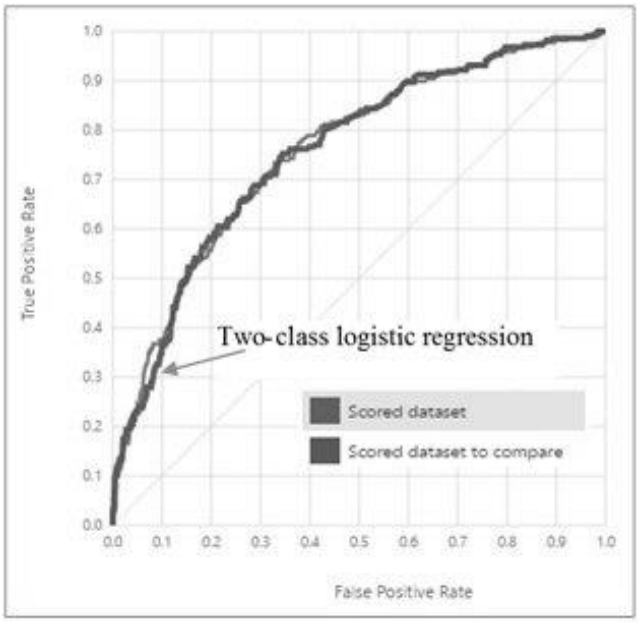
Fig. 1. **The Receiver Operating Curves for models created by using Two-class decision jungle and Two-class logistic regression algorithm**

On the chart (Fig. 1.), the curve "*scored dataset to compare*" is the ROC curve for the Two-Class Logistic regression model, on the chart (Fig. 2.) the curve "*scored dataset to compare*" is the ROC curve for the Two-class averaged perceptron, the curve "*scored dataset*" is the curve for the Two-Class Decision Jungle model. The models have similar performance. The area under the curve (AUC) for the decision jungle model is 0.753, for the logistic regression model is 0.757 and for the averaged perceptron is 0.757 too (Fig. 3).



Source: author's calculations based on Azure Machine Learning Studio tool

Fig. 2. **The Receiver Operating Curves for models created by using Two-class decision jungle and Two-class averaged perceptron**



Source: author's calculations based on Azure Machine Learning Studio tool

Fig. 3. **The Receiver Operating Curves for models created by using Two-class logistic regression and Two-class averaged perceptron**

Due to the use of cloud technology, the better dropout prediction models can be used as web service for the use in applications for the student data to identify students who are prone to dropout because of poor academic performance. That simplifies the access to the created model as well as the usage and retraining of the models.

Model Creation in IBM SPSS Modeler

IBM SPSS Modeler supports the different nodes of modeling algorithms and methods of *Classification, Association* and *Segmentation*. To create a "dropout predicting" model in IBM SPSS Modeler there were used separate nodes

containing one particular modelling algorithm as well as the "*Auto Classifier*" node, which allows the use of various modelling algorithms. For each models, the parameters, evaluation criteria and a number of the models to be created were determined. The models were evaluated on the basis of two samples which are the training set and the test set. To evaluate and compare the models, there were used the following metrics provided by IBM SPSS Modeler and they are "*Overall accuracy*", "*Area under the ROC curve*", "*Profit (Cumulative)*", "*Lift (Cumulative)*", "*Number of input fields used*" (IBM SPSS Modeler 17 Modeling Nodes).

In this study, 12 IBM SPSS Modeler machine learning models have been tested to create predictive dropout model (Fig 4.).

The models based on *C5*, the *CHAID* and the *Quest* modelling algorithms were shown the best overall accuracy (Fig. 4). Those algorithms generates decision trees and the model based on C5 algorithms has the best overall accuracy result (82.145). The models based on *CHAID* algorithm shows the best result in the metric - "*Area under curve*" that it is 0.741.

The "*Auto Classifier*" node was used to create the models, and this made it possible to create an ensemble model from several modelling algorithms. IBM SPSS Modeler documentation shows that through combining the algorithms the higher prediction accuracy can be achieved. (IBM Knowledge Center 2017). In this study the ensemble model did not show the best accuracy results.

Model	Build Time (mins)	Max Profit	Max Profit Occurs in (%)	Lift(Top 30%)	Overall Accuracy (%)	No. Fields Used	Area Under Curve
C5 1	< 1	96.515	7	1.932	82.145	3	0.692
CHAID 1	< 1	67.143	3	1.837	80.855	5	0.741
Quest 1	< 1	-43.007	1	1	80.72	12	0.5

Source: author's calculations based on IBM SPSS Modeler tool

Fig. 4. **Created models evaluation metrics in IBM SPSS Modeler**

Table 2

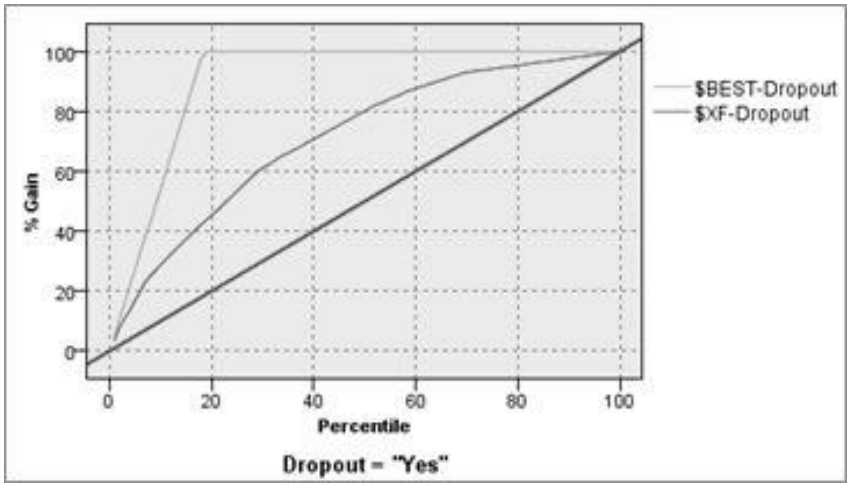
Result for output field Dropout

Modelling algorithm	**Correct**	**Wrong**
C5 1	82.97%	17.03%
CHAID 1	82.16%	17.84%
Quest 1	81.56%	18.44%
Auto Classifier (3 better models: C5, CHAID, Quest)	82.56%	17.44%

Source: author's calculations based on IBM SPSS Modeler Evaluation Metrics of tested models

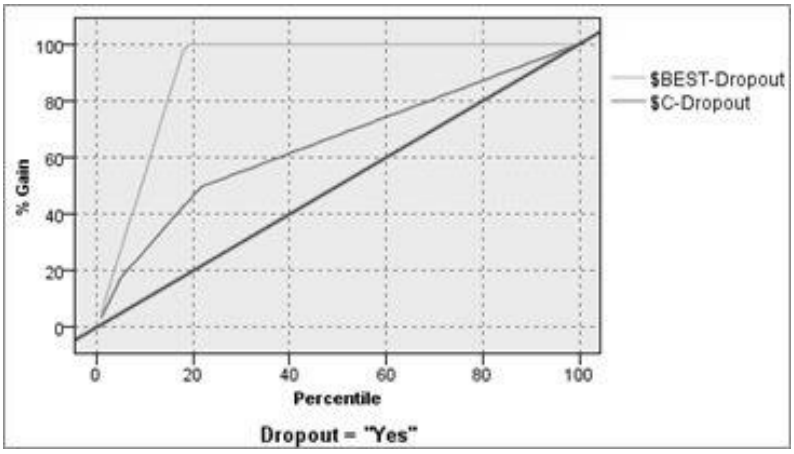
In the research the Gains chart was applied to models comparing. *Gains* chart shows the ratio of the overall number of students from "*Droupout*" category to total number of students (Fig. 5, Fig. 6, Fig. 7).

The Gains charts (Fig. 5, Fig. 6, Fig. 7) display the evaluation for the calculated prediction model by using *Auto Classifier node, C5 modelling algorithm, CHAID modelling algorithm* respectively, in comparison with an ideal (the best) model and with baseline (diagonal line - the possible outcome of the forecast if the model is not used at all).



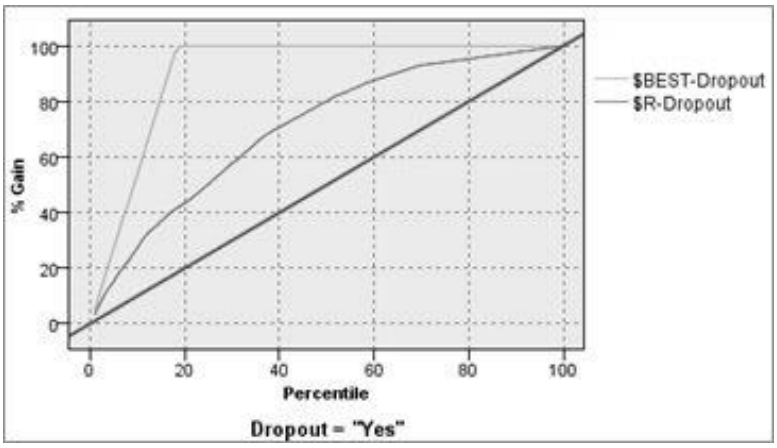
Source: author's calculations based on IBM SPSS Modeler tool

Fig. 5. **The Gains chart for model created by 3 modelling algorithms by using *Auto Classifier* node**



Source: author's calculations based on IBM SPSS Modeler tool

Fig. 6. **The Gains chart for model created by C5 modelling algorithm**



Source: author's calculations based on IBM SPSS Modeler tool

Fig.7. **The Gains chart for model created by CHAID modelling algorithm**

According to the Gains charts characteristics, the best result was shown by the models based on ensemble (*3 better models: C5, CHAID, Quest*) and CHAID modelling algorithm.

Conclusions and Recommendations

1. The Microsoft Machine Learning environment the best results shows the models that have been calculated by using following algorithms: *Two-class averaged perceptron, Two-class logistic regression, Two-class decision jungle*.
2. IBM SPSS Modeler environment best result showed models with separated algorithms *C5; CHAID; Quest* and ensemble model from 3 modelling algorithms.
3. The student dropout predictive models that have been created by Microsoft Machine Learning tools are easy to use as web service to dropout prediction.

In order to improve models of the original sample should be accompanied by data that describe student learning assessment at the university. The reasons for the student's dropped out should be specified. At developing the models there should be taken into account the factors derived from students' survey result to clarify the reason for student drop out.

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CHANGES AND INNOVATIONS IN THE METHODS OF LITHUANIA'S STUDENT ENTREPRENEURSHIP DEVELOPMENT

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Abstract. The article analyses the methods applied to student entrepreneurship development, their variety and innovative application approaches. The authors in the study define and present the conceptions of entrepreneurship and entrepreneurship development, as well as methods applied to entrepreneurship development, which are grouped into active and passive ones. Also, in research, the evaluation results of entrepreneurship development methods of Lithuanian students are summarised. The research aims to identify what methods of entrepreneurship development that have been implemented are the most important for students. In order to receive required information for a study, the survey method was employed. During the study, the questionnaires were distributed directly to students and alsosent by e-mails asking them to fill in the presented questionnaire. There were accumulated 420 questionnaires received from higher education institutions of Lithuania, i.e., from college and university students studying in Management or Administration studies. Having evaluated the results, it was concluded that active methods of entrepreneurship development are more valuablethan the passive ones. The authors came to a conclusion that in developing the features of entrepreneurship all methods are necessary and important, however, only when used in a general complex of development methods, i.e., not excluding unused methods too.

Keywords: *entrepreneurship, entrepreneurship development, innovations, methods.*

JEL code: L26

Introduction

Although, in foreign literature various articles on entrepreneurship have been published for more than two decades, in Lithuania this subject, however, has been considered only recently. Currently, a subject of entrepreneurship is very popular in various researchconducted by Lithuanian scientists: not only in the field of management, but also in educology, economics, political and other fields of science. Entrepreneurship is considered as a catalyst for economicgrowth, competitiveness, spread of innovations, and thus popularity and relevancy of this subject is obvious.

Relevance and level of investigation.An increasing consideration to problems of entrepreneurship development is felt both in foreign and Lithuanian scientific publications. Lithuanian authors, such as J. Valuckienė, S. Ruškus, J.Balčiūnas (2004), J. Žvinklys and E.V.Vabalas (2006), I. Zaleskienė, I. Žadeikaitė I. (2008), O. Stripeikis (2008), have analysed various theoretical and practical aspects of entrepreneurship.

Foreign scholars analyseentrepreneurship in various aspects. They discuss theconcept of entrepreneurship (Drucker, 1985; Hisrich, Timmons, 2003; Kirby, 2003), distinguish characteristics and features of an enterprising individual that need to be developed (Utsch and Rauch, 2000; Cromie, 2000; Henry et al., 2003), revealthe content of abilities featured inan enterprising individual (McCarthy, 2000; Raffo et al., 2000) as well as abilities necessary to establish a company or occupation in an organisation (Galloway et al., 2005).

Although many studies analysethe phenomenon of entrepreneurship and its expression, however, it is noticed that more and more consideration is given to a search and analysis of methods for entrepreneurship development. Studies

performed by G. Strazdienė (2006), L. Paulioniene (2007), Ch. Norrman et al. (2014), S.Robinson et al. (2016) and other researches may serve as examples.Innovations in entrepreneurship teaching and training methods have been analysed in literature for the last decade. R. Klapper (2010) in her study underlined that network analysis tools such as repertory grids should find their place in the training programmes. Ch. Norrmann et al. (2014) discussed four innovative types of entrepreneurship learning activities: "flipped classroom", "experiential learning exercises", "sharp live cases", and "theory-based practical exercises". S. Robinson et al. (2016) made a conclusion that entrepreneurship education needs to involve students as co-creators of the classroom in order to promote ownership of the learning process. Foreign scholars analyse entrepreneurship as a process stating that this process and entrepreneurship development must be closely related, and thusa holistic approach and consistency must be maintained.

Research on student entrepreneurship development methods presupposes **the research problem** – which methods are to be applied to entrepreneurship education of studentsin order the entrepreneurship development process to be more efficient; moreover, there is necessary to make assessment and identify what changes and innovations in entrepreneurship development methods promote moststudents' intentions to start their own businesses.To achieve the set research problem, the following questions have been formulated: What does promotean individual's intentions to start own business? What changes in entrepreneurship development are relevant in terms of encouraging Lithuanian students' intentions to start their own business? What changes and innovations would promote student entrepreneurship development at higher education schools in Lithuania?

The object of research: entrepreneurship development methods.

The aim of research: to identify what methods of entrepreneurship development are the most important for students.

The tasks of research: 1) to define concepts of entrepreneurship and entrepreneurship methods used in entrepreneurship development; 2) to summarise the study results of entrepreneurship development methods relevant to Lithuanian students.

Researchmethods. The methods used for scientific investigation were comparative analysis of scientific literature, critical analysis, systematisation, and generalisation. In order to receive the required information for a study, the survey method was applied, whereas for the research, a questionnaire survey was used. The survey was conducted by means of a standardised questionnaire, distributed to respondents by e-mail. The majority of the questionnaire items were closed-ended, and the Likert assessment scale was applied. For data processing, the SPSS 15.0 software package was applied, asthe principal advantage of the SPSS software package is a large choice of contemporary statistical analysis methods, a diversity of visualisation tools for the outcomes of data analysis (data tables, charts, distribution curves), and easily manageable interactive interface (Pukėnas, 2011). To properly present the formatted research outcomes, the obtained data were processed both by SPSS 15.0 and MS Excel, which enabled a comprehensive analysis of the data and their presentation in various charts and tables: all that helped us to better reflect the research outcomes, their trends, and to understand them.

1. Definition of Entrepreneurship. Entrepreneurship Development Methods

In this study, the authors considerthe following conception of entrepreneurship: entrepreneurship is a thinking manner of an individual, his/her personal features and competences, allowing to apply the acquired knowledge in life, i.e., specific capabilities allowing not only to organise own business or other activity, but also to make decisions and take responsibility for the performed actions as well.

Entrepreneurship development covers knowledge, development of skills, facilities and personal features, corresponding age and level of perception of an individual. An individual is introduced with ideas, providing also theoretical and practical knowledge. Entrepreneurship development is an activity. A desirable result will be received only

after a proper input of efforts, i.e., an individual will manage to plan his/her carrier, she/he will reach more success in business and other activity, will not be influenced by pseudo-entrepreneurs and anti-entrepreneurs.

Entrepreneurship is related to personal characteristics of an individual and their expression in practice. The application of features common for entrepreneurs into practice depends on the development of an individual.

In order to develop entrepreneurship of an individual it is necessary to understand how entrepreneurs are studying (Minniti and Bygrave, 2001), to consider their studying needs paying attention to personal features of an entrepreneur and business development (Rae and Carswell, 2000). The authors D. Rae and M. Carswell (2000) suggest developing capabilities, necessary for discovering and exploitation, by studying. An individual accepts behaviour of an entrepreneur within a studying process.

Foreign authors in scientific literature analyse the efficiency issues of entrepreneurship development programmes, however, there are no entrepreneurship development programs created in Lithuania. Entrepreneurship development is included as a studying object only in the study programs of Management and Public Administration.An issue of entrepreneurship development in Lithuania may be analysed not in terms of entrepreneurship development programs, but only in terms of limited separate methods that stimulate entrepreneurship. Garavanand O'Cinneide (1994) suggest that “active” rather than “passive” pedagogical methods are more appropriate for nurturing entrepreneurial attributes. As shown in Table 1, scholars in scientific publications distinguish entrepreneurial training methods dividing them into passive and active ones.

Table 1

Entrepreneurship development methods

Group of Methods	Methods	Authors
Active methods	Real-life cases Virtual cases Role plays Problem solving Business plan evaluation Behavioural exercises Computer simulations Interviews with entrepreneurs Coaching	Fayolle, Gailly (2008).
	Learning by doing	Gibb (1993; 1996)
	Learning from failure	Shepherd (2004)
	Business plan	Hills (1988); Johannissonet al.(1998)
	Problem-based learning	Kolvereid (1996)
	Role plays Management simulations Brainstorming Team projects Participative discussion sessions	Rae (2000); Fiet(2001); Carayanniset al.(2003)
	Experiential learning Business mentoring	
Passive methods	Case studies Lectures Readings	CollinsonandQuinn (2002); Davies et al.(2002); LadzaniandvanVuuren(2002)
	Lectures Handouts Required readings Programmed instruction Content-oriented examinations	GaravanandO'Cinneide (1994)

Source: created by the authors.

Reflective teaching techniques help participants to acquire knowledge about the mechanics of running a business, but they ignore the complexities of the environments in which entrepreneurs actually operate. Active pedagogy requires the instructor to facilitate, not control, the learning process. The differences in the teaching styles that the above mentioned

scholars have deemed appropriate for entrepreneurial attributes development, as opposed to management skills development.The traditional lecture format with all its predictability may not be the most effective method. Traditional approaches to teaching may, in fact, inhibit the development of the requisite entrepreneurial attitudes and skills. Therefore, the active role of the student in the learning process is very important (Kirby, 2002).

Innovations in the methods of entrepreneurship teaching and learning include the need to support students by helping them to engage into entrepreneurship learning process. Innovating in entrepreneurship training requires various approaches, different from traditional teaching. EuropeanCommission (2008) highlights a need for more interactive learning approaches where the teacher acts rather as a moderator than a traditional lecturer, where multi-disciplinary approaches to entrepreneurship teaching are adopted and where, among others, specific business skills and knowledge of how to start a company and run it are successfully transmitted. The authors (Robinson, Neergaard, Tanggaard, Krueger, 2016, p.661) find that "it is sometimes advantageous to invoke and combine different learning theories and approaches in order to promote entrepreneurial awareness and mindset; it is also necessary to move away from entrepreneurship education as being teacher led to being more student-centered and focused on experiential and existential lifelong learning practices".The purpose of this study is not only to evaluate the entrepreneurship development methods applied to students, but also to clarify which methods are more efficient while developing students' entrepreneurship features, values, perception and skills.

2. Assessment of Entrepreneurship Development Methods: Research Results of Lithuanian Students

Respondents of the study are students of higher education institutions in Lithuania, i.e., college and university students studying in Management or Administration studies. The scope of the study – 420 respondents and they have distributed as follows: 78.23% of the respondents are women and 21.77% – men; 70.74 % of the respondents are students of universities and the remaining 29.26% – students studying at colleges.

Therefore, to receive required information for the study, the survey method was employed. During the study, the questionnaires were distributed directly to students and alsosent themby e-mails askingto fill in the presented questionnaire. In total, there were accumulated 426 questionnaires. Analysing the received questionnaires, it was concluded that 6 questionnaires were not suitable for further analysis. The period of questioning was three months. To estimatethe applied methods to entrepreneurship development of students fromhigher educational institutions in Lithuania, a statistical data was processed and analysed using the statistical data analysis package SPSS 15.0. Moreover, the ***average evaluation interpretation*** was calculated, as well as **correlation analysis performed.**

Methods applied to students' entrepreneurship development athigher education institutions of Lithuania are distinguished depending on the intensity of individual's involvement into practical activity withinthe entrepreneurship development program. Therefore, the methods are grouped into active and passive ones. The efficiency of a chosen method for developing individual's entrepreneurship is valued in accordance with its importancein developing such features of entrepreneurship asindividual achievement, preparation to risk, self-control and self-confidence. For instance, passive entrepreneurship methods include such features as reading of books, lectures, consultations, dialogues, creation and discussion of articles, application of interdisciplinary knowledge. Yet active methods cover preparation of business plans, visits to business companies, job in a business company, computer modelling, role-playing, analysis of cases, training, brainstorming, team projects, problem solving and critical thinking. A Likert scale was selected to evaluate and range entrepreneurship development methods. The range is between 1 and 5.

Table 2

The most suitable methods to develop an individual's feature of achievement

Methods	N	Average	St. deviation	METHODS
Reading of books	418	3.70	0.83	Passive
Lectures	418	3.90	0.73	Passive
Preparation of business plans	418	4.02	1.66	Active
Visits to business companies	418	4.07	0.80	Active
Consultations	418	4.17	0.70	Passive
Job in a business company	417	4.44	0.70	Active
Dialogues	416	3.79	0.82	Passive
Computer modelling	417	3.56	0.83	Active
Role-playing	417	3.56	0.86	Active
Analysis of cases	417	3.81	0.83	Active
Creation and discussion of articles	417	3.68	0.83	Passive
Training	415	3.68	0.91	Active
Brainstorming	416	3.66	0.89	Active
Team projects	415	4.05	0.78	Active
Problem solving	417	4.21	0.76	Active
Critical thinking	410	4.22	0.80	Active
Application of interdisciplinary knowledge	415	3.91	0.74	Passive

Source: authors' calculations based on research data.

As can be seen in Table 2, the passive methods, significant to develop the achievement feature, are the following: consultations, lectures and application of interdisciplinary knowledge. The mentioned methods have been evaluated from 4.17 to 3.9 points. However, the active methods are: job in a business company, critical thinking and problem solving. Thus, the received results show that active methods are more significant in entrepreneurship development as their values differ from 4.4 to 4.21 points.

Table 3

The most suitable methodsto develop an individual's feature of preparation to risk

Methods	N	Average	St. deviation	METHODS
Reading of books	416	3.07	1.02	Passive
Lectures	417	3.35	0.92	Passive
Preparation of business plans	416	3,70	0.88	Active
Visits to business companies	417	3.91	0.86	Active
Consultations	415	3.96	0.76	Passive
Job in a business company	417	4.12	0.85	Active
Dialogues	415	3.68	0.90	Passive
Computer modelling	416	3.34	2.40	Active
Role-playing	416	3.57	1.05	Active
Analysis of cases	414	3.98	0.87	Active
Creation and discussion of articles	414	3.42	0.92	Passive
Training	412	3.65	0.98	Active
Brainstorming	414	3.60	1.02	Active
Team projects	417	3.80	0.91	Active
Problem solving	416	4.13	0.85	Active
Critical thinking	416	4.18	0.87	Active
Application of interdisciplinary knowledge	415	3.64	0.92	Passive

Source: the authors' calculations based on research data.

In the field of passive methods,a feature of preparation to risk may be appointed to such activities as consultations, dialogues, application of interdisciplinary knowledge, and their values differ from 3.96 to 3.64 points. Job in a business company, critical thinking and problem solving are distinguished in the field of active methods. Their values vary between 4.18 and 4.12 points.

Table 4

The most suitable methods to develop an individual's feature of self-control

Methods	N	Average	St. deviation	METHODS
Reading of books	418	3.65	0.98	Passive
Lectures	418	3.49	0.91	Passive
Preparation of business plans	416	3.31	1.03	Active
Visits to business companies	414	3.51	1.01	Active
Consultations	418	3.89	0.81	Passive
Job in a business company	417	3.84	0.88	Active
Dialogues	417	3.80	0.87	Passive
Computer modelling	417	3.05	1.11	Active
Role-playing	416	3.62	1.02	Active
Analysis of cases	414	3.74	0.93	Active
Creation and discussion of articles	418	3.58	0.96	Passive
Training	412	3.63	1.00	Active
Brainstorming	416	3.65	0.97	Active
Team projects	415	3.71	0.92	Active
Problem solving	418	4.04	0.85	Active
Critical thinking	417	4.02	0.89	Active
Application of interdisciplinary knowledge	416	3.51	0.95	Passive

Source: theauthors' calculations based on research data.

The passive methods that are significant in developing self-control are the following: reading of books, consultations and dialogues. Their values vary from 3.89 to 3.65 points. Problem solving, critical thinking and job in a business company are distinguished in the field of active methods, as the values differ from 4.04 to 3.84 points.

Table 5

The most suitable methodsto develop an individual's feature of self-confidence

Methods	N	Average	St. deviation	METHODS
Reading of books	414	3.49	1.05	Passive
Lectures	406	3.53	0.96	Passive
Preparation of business plans	410	3.47	0.99	Active
Visits to business companies	412	3.80	0.92	Active
Consultations	410	3.97	0.82	Passive
Job in a business company	413	4.08	0.86	Active
Dialogues	412	3.95	0.88	Passive
Computer modelling	411	3.00	1.07	Active
Role-playing	413	3.69	0.95	Active
Analysis of cases	410	3.72	0.92	Active
Creation and discussion of articles	411	3.88	0.99	Passive
Training	410	3.76	1.00	Active
Brainstorming	410	3.68	0.97	Active
Team projects	413	3.94	0.92	Active
Problem solving	411	4.11	0.81	Active
Critical thinking	413	4.05	0.91	Active
Application of interdisciplinary knowledge	411	3.59	0.94	Passive

Source: the authors' calculations based on research data.

As could be expected, the passive methods that are significant to develop a featureof self-confidence appearedas follows: consultations, dialogues, creation and discussion of articles. Their values vary between 3.97 and 3.88 points. Problem solving, critical thinking and job in a business company may be distinguished in the field of active methods astheir values differ between 4.11 and 4.05 points. In order to achieve a comprehensive analysis of entrepreneurship development methods, the authors tried to establish links betweenthe methods and certain elements, defined in the concept of entrepreneurship, thatfoster entrepreneurship development. Below in the paper, there are presented statistical

connections of active and passive methods with personal features, skills, values and conception of entrepreneurship that have been analysed in the study.

When analysing correlation between entrepreneurship development and features important to entrepreneurship, personal features are divided into proactivity and creativity groups. In the same way, skills are grouped into conceptual, technical and communicational groups. However, values are grouped in accordance with valuable orientation, such as seek for useful competitiveness in the market, self-satisfaction with the executed activity, solving of community problems, seek forhigher income, acknowledgment in society, business maintenance and maintenance of positive attitude to business.

Furthermore, the conception of entrepreneurship is differentiated in accordance with the students'perception of entrepreneurship, i.e.,the perception of entrepreneurshipas a practical activity, a set of personal features or as the unknown phenomenon.

In this study, the authorsestablisheda correlation of entrepreneurship development methods with conceptual, technical and communicational skills.

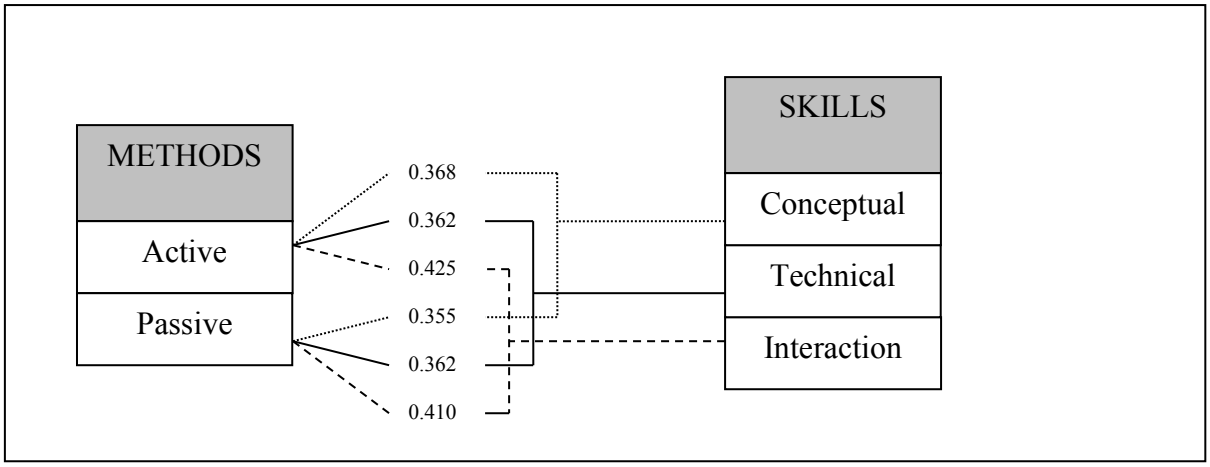

Fig. 1. **Correlation between entrepreneurship development methods and skills**

The received values between development methods and skills are higher in comparison with development methods and features. Thus, the assumption was made that it is necessary to search for new methods in order to develop skills of proactivity and creativity.

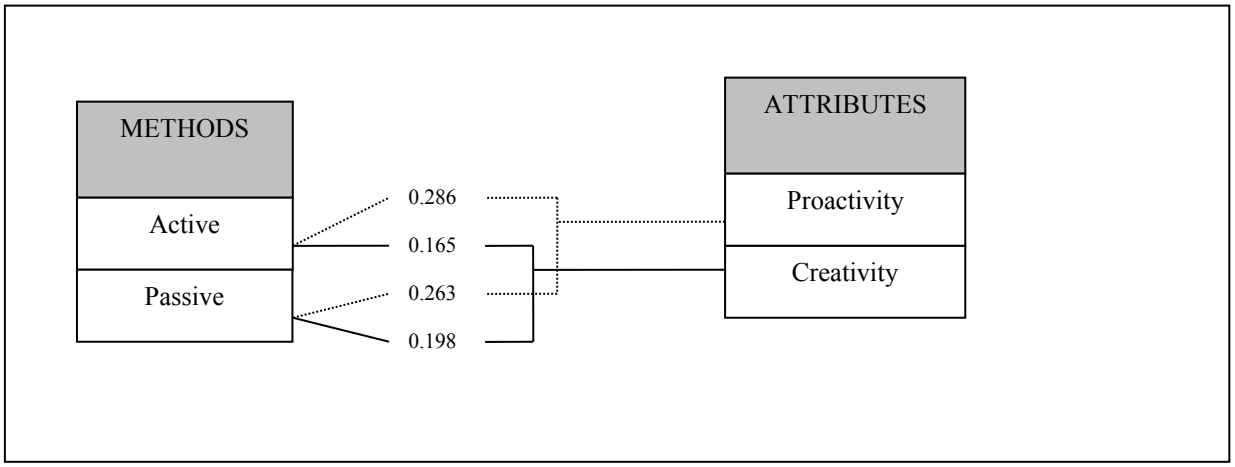

Fig. 2. **Correlation between entrepreneurship development methods and attributes**

Source: theauthors' calculations based on research data.

Entrepreneurship development methods correlate with the distinguishedattributes that are important for entrepreneurship, mainly, such as proactivity and creativity.

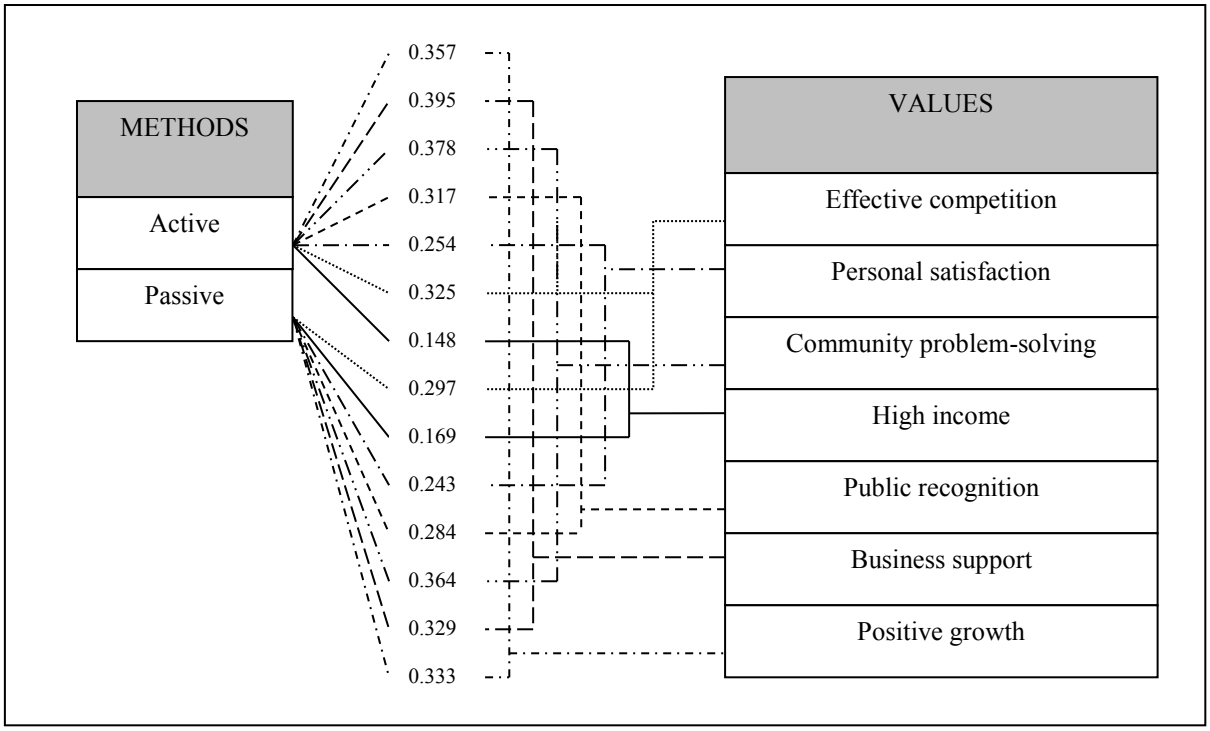

Fig. 3. **Correlation between entrepreneurship development methods and values**

In Figure 3, there are presented dimensions of values that have been distinguished in the study. It has been found that both active and passive methods correlate with all dimensions of the distinguished values.

Turning to entrepreneurship, so it is understood as a practical activity, as a feature and as the unknown phenomenon. Thus, the aim of the authors in the study was to set statistical links between the mentioned entrepreneurship dimensions, and the active as well as the passive entrepreneurship development methods.

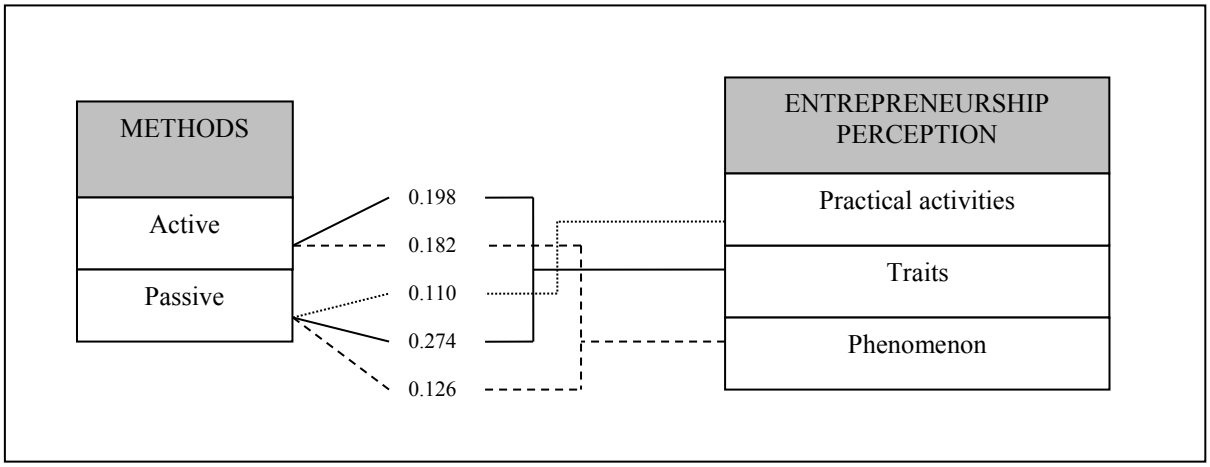

Fig. 4. **Correlation between entrepreneurship development methods and entrepreneurship perception**

It has been found that passive methods are statistically significant in regard with all three dimensions of the entrepreneurship conception. Whereas, in the analysis of correlative links of active entrepreneurship development methods and dimensions of the entrepreneurship concept, statistically significant links have been recorded only between two dimensions of the entrepreneurship conception. For instance, active entrepreneurship development methods correlate with the entrepreneurship conception that is perceived as a personal feature and the phenomenon. In addition, after the evaluation of the results, it has been concluded that active methods of entrepreneurship development are more valued in comparison with the passive ones. Besides, the authors came to a conclusion that in developing the features of entrepreneurship all methods are necessary and important, however, only when used in a general complex of development methods, i.e., not excluding unused methods too.

Finally, a model of student's entrepreneurship development is as follows. It was discovered that intentions to establish own business are activated by encouraging students' potential and eagerness. In terms of starting own business, it is important to develop a characteristic of proactivity and creativity, to encourage positive proportion(attitude) of time devoted to family and friends, and to develop skills of entrepreneurship. This implies that training of technical and communicational skills, formation of favourable attitude of family and friends to own business establishment, develops**a feature of proactivity**. Whereas, **afeature of creativity** is developed by training technical skills.**Values** of students oriented to entrepreneurship must be developed by applying methods of *mentality development, practical activity and information supply*that certainly help to train communicational, conceptual and technical skills. Moreover, application of *modelling–imitation* methods (modelling using computer, role-playing) are the most purposeful in developing students' **technical** entrepreneurship skills. The methods of *practical activity* (visits to business companies, consultations, work in a business company) and *development of mentality* (critical thinking, problem solving, application of interdisciplinary knowledge) are used in developing**communicational** skills of entrepreneurship. Also, the methods of *mentality development* are applied seeking to develop **conceptual** skills of entrepreneurship.

Conclusions

Having analysed the research results, the authors have come to the following conclusions:

1) In scientific literature there is presented a considerable scope of attitudes on the very subject of entrepreneurship, and a great variety of methodson entrepreneurship development, which in our study are divided into two groups, namely, passive and active methods. It appeared that active methods of entrepreneurship development are valued as more significant in developing students' features of entrepreneurship. For example, job in a business company, critical thinking and problem solvinghave been distinguished in the field of active methods. Whereas, passive methods comprise the following activities: discussions, consultations, lectures and application of interdisciplinary knowledge.

2) Moreover, in the study there has been set a correlation between entrepreneurship development methods and individual's characteristics thatlead to entrepreneurship. The correlation is stronger between entrepreneurship development methods and formed skills, and values of an enterprising individual. However, a weaker correlation was observed between development methods and features of an enterprising individual and the conception of entrepreneurship. Thus, it is important to find a more accurate definition of entrepreneurship perception seeking to use entrepreneurship development methods more efficiently. While developing students' entrepreneurship it is of utmost significance toform necessary competences by fostering students' perception, skills and knowledge, positive attitude and motivation to start own business. Furthermore, training of entrepreneurship skills and provided knowledge determine a framework of individual's creative potential, which an individual may use in search for new possibilities to establish own business. As for perception of entrepreneurship in the context of "being" an entrepreneur and an entrepreneur who is "making", so here can be observed a dual way of entrepreneurship development. Acquired knowledge and skills are more significant for business "making", whereas"being" an entrepreneur is related with an attitude to own business and internal motivation of an individual. However, acquired knowledge and training of skills alone will not create assumptions for the individual to overcome internal barriers of fear and pessimistic moods while realising potential intentions to start own business. Therefore, while training entrepreneurship competences it is necessary to spread and foster the individual'soptimistic attitude towards own business establishment.

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CHANGES OF ETHNIC COMPOSITION IN THE BALTICS

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Abstract. The aim of the current paper is to present demographic changes in the three Baltic States and to analyse the developments of titular ethnicities (ethnic Estonians, Latvians and Lithuanians) and ethnic minorities. Our empirical analysis is based on data of Population censuses and current registration in the Baltic States, Eurostat database and information on government views and policies from the UN World Population Policies database. Statistical analysis is performed using descriptive statistics, time series indicators, ethnic diversity indexes and graphical methods.

The ethnic structure for the Baltics on the whole is calculated and analysed. After regained political independence the number of population of titular ethnicities has decreased, but at a slower rate than average and their proportion has increased. Even now ethnic minorities constitute one-fourth of the total in the Baltic population.

The Baltic States have one of the highest population loss rates in the world. The excess of deaths over births and emigration is prevailing in international migration processes, particularly in Lithuania and Latvia. Very low fertility rate and emigration of younger people advanced population ageing of Slavs and other minorities groups. The age structure of ethnic minorities in each state is older than structure of titular ethnicities.

The scenarios of depopulation prevail in population projections in the Baltic States. The share of ethnic Estonians, Latvians and Lithuanians in all the three states most likely will increase, particularly in Latvia and Estonia, because of their relatively higher fertility and vitality (life expectancy), and higher part of returning home nationals.

Keywords: *depopulation, ethnic composition, ethnic minority, titular ethnicity*

JEL code: J15, Z13

Introduction

The Baltic States have historically formed traditions in the field of analysis of ethnodemographic development (especially in Estonia and Latvia). In all censuses carried out in the Baltics since the end of the 19th century, including the 2000-2001 and 2011 censuses, respondents were asked to name their ethnic identity and/or their mother tongue. This gave a basic information for study of ethnic breakdown and its dynamics, and characteristics of numerically largest ethnic groups in these countries for a longer period. Although each of the Baltic State has had a different history, they have experienced a broadly similar fate from the 18th century when they were absorbed into the Russian empire. These countries were politically independent only for two decades in the 1920s and 1930s and have regained political independence since beginning of the 1990s.

Like other countries in the former Soviet Union, the Baltic States underwent major social and demographic change. Transformation from planned to marked economy since the early 1990s was accompanied by a rapid decline of population, including in working ages, due to low population reproduction and large-scale emigration of both the titular ethnicities and minorities. This study is one of the first studies to analyze the dynamics of ethnic composition of the Baltics on the whole.

Dynamics of the Size and Composition of Major Ethnoses

The dynamics of the population numbers and ethnic structures in every country since 1989 are indicated in Table 1. During the Soviet period the proportions of the titular ethnicities had a tendency to decrease in Latvia and Estonia. In Lithuania, fertility and natural increase rates of Lithuanians were comparatively high, and the immigration of Slavs did not cause obvious changes in their ratios. However, starting with beginning of the 1990s the population of Estonians, Latvians

Table 1

Changes in the ethnic composition in the Baltic States: 1989-2016 (in thousands and %)

	In thousands			Percentage		
	1989	**2011**	**2016**	**1989**	**2011**	**2016**
Estonia - total	**1566**	**1295***	**1 316**	**100**	**100**	**100**
Estonians	963.3	902.5*	905.8	61.5	69.7*	68.8
Russians	474.8	326.2	330.3	30.3	25.2	25.1
Ukrainians	48.3	22.6	23.3	3.1	1.8	1.8
Belarussians	27.7	12.6	12.2	1.8	1.0	0.9
Finns	16.6	7.6	7.7	1.1	0.6	0.6
Jews	4.6	2.0	2.0	0.3	0.2	0.2
Others and unknown	30.4	21.0	34.6	1.9	1.5	2.6
Latvia - total	**2667**	**2075**	**1 969**	**100**	**100**	**100**
Latvians	1388	1256	1 216	52.0	60.5	61.8
Russians	905.5	556.4	504.4	34.0	26.8	25.6
Belarussians	119.7	73.8	66.0	4.5	3.6	3.4
Ukrainians	92.1	49.1	44.6	3.5	2.4	2.3
Poles	60.4	47.2	41.5	2.3	2.3	2.1
Lithuanians	34.6	26.9	23.9	1.3	1.3	1.2
Jews	22.9	6.5	5.0	0.9	0.3	0.3
Romanies	7.0	6.6	5.3	0.3	0.3	0.3
Others and unknown	36.6	52.4	61.9	1.4	2.5	3.1
Lithuania - total	**3675**	**3043**	**2 889**	**100**	**100**	**100**
Lithuanians	2924	2561	2 513	79.6	84.1	87.0
Poles	258.0	200.3	161.8	7.0	6.6	5.6
Russians	344.5	176.9	135.8	9.4	5.8	4.7
Belarussians	63.2	36.2	34.7	1.7	1.2	1.2
Ukrainians	44.8	16.4	17.3	1.2	0.5	0.6
Jews	12.4	3.1	2.9	0.3	0.10	0.1
Latvians	4.2	2.0	2.9	0.11	0.07	0.1
Others and unknown	23.4	47.2	20.2	0.6	1.6	0.7

Source: National statistical offices. (CSB, 2017; Statistics Lithuania, 2017; Statistics Estonia, 2017)
* Without estimated number of non-enumerated residents (approximately 28,000 persons). This means that estimated target population would be more than 1,300,000). Approximately one half of the non-numerated residents are ethnic Estonians-about 14 thousand (Tiit E.M., 2012).

and Lithuanians decreased slightly but population of non-titular ethnicities dropped sharply. Thus, the proportion of ethnic minorities had systematically decreased as a result of natural movement, emigration and assimilation. The calculation of special ethnic diversity indexes (the more diverse the ethnic composition of a territory, the higher the value of the index) at the national level shows that during the period of independence every Baltic State has become ethnically less diverse. Still, in Latvia there is one of the most diverse ethnic composition in Europe (index 0.54 in 1959, 0.61 in 1989 and 0.54 in 2011). In Lithuania where the proportion of Lithuanians exceeds 85% the value of the index dropped below 0.30. (see Figure1).

According to calculations of Hungarian scholar Ádám Németh, today Latvian society is the fourth most ethnically diverse in Europe after Montenegro, Bosnia and Herzegovina, and Switzerland. In 2011, only 39% of Latvian municipalities could been considered ethnically relatively homogeneous, where slightly more than one-tenth of Latvia's population lived. (Németh, 2013).

The collapse of the Soviet Union and the regaining of political independence in Estonia, Latvia and Lithuania cardinally changed social and economic conditions, the directions and intensity of migration and natural movement of population. The Baltic States from countries of immigration became countries of emigration. During the Soviet period three Baltic republics were ahead other European countries concerning high relative net migration. According to the newest data of the national statistical offices, about 600 thousand foreign-born residents or 1/10 of the total population lived in the Baltics in mid-2010s (Eurostat, 2015). Almost half of them lived in Latvia (see more paragraph "Foreign-born population").

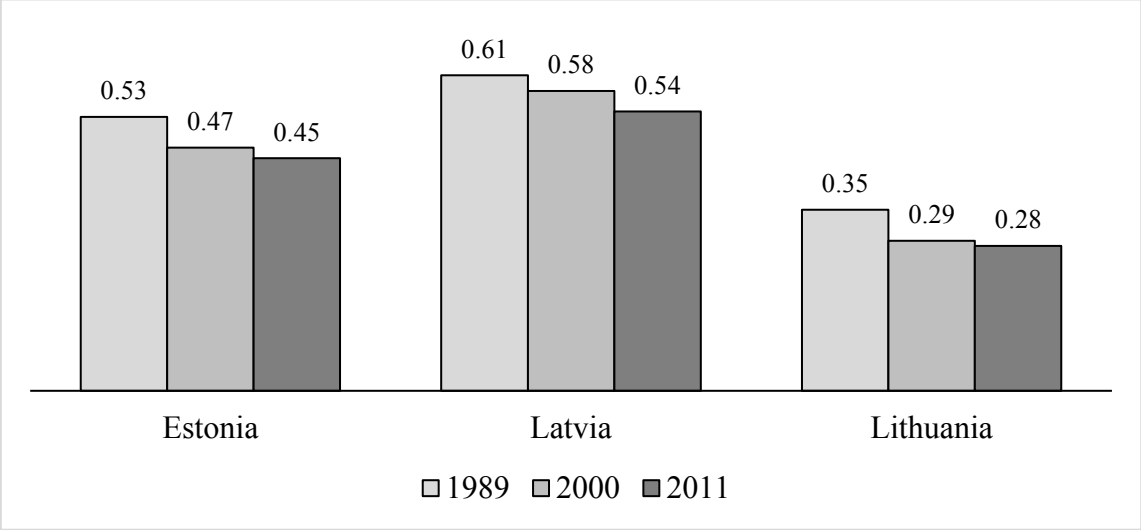


Figure 1. **The Ethnic Diversity Indexes* in the Baltic States in 1989-2011**

(Source: Calculation of the authors based on censuses data of national statistical offices)

** The indexes were calculated using formula* $I = 1 - \sum_{i=1}^{n} p_i^2$

where p_i denote proportion of every ethnic group within the total population

The main migration inflows which were characteristic to the Soviet period turned into main outflows. The level of emigration and repatriation to their homelands reached peak in 1992, when the former Soviet military forces and their family members left the Baltic region. After the accession to the EU in 2004 emigration from the Baltics even increased more substantially, especially when an economic decline began in 2008-2010. The scope of emigration from Lithuania and Latvia still is very high.

Another distinctive feature of the demographic development of the Baltic countries in the 1980s was fertility increase. The mortality stagnation had reached an alarming stage, and natural growth was low, especially for the titular ethnicities. The Slavic peoples with fertility rates below replacement level gained a solid natural increase because of a younger age structure (as a result of the influx of predominately younger immigrants).

Around the turn of the millennium, contrary to the Soviet period, natural movement balance is distinctly negative, more explicitly in Latvia and Lithuania. The excess of deaths over births has been since 1991, and in relative terms the greatest natural population losses are among minorities which are ageing faster than ethnic Estonians, Latvians and Lithuanians.

The publication of results of the 2000-2011 round censuses makes it possible to analyse the dynamics of ethnic structure and patterns of the titular ethnicities and ethnic minorities during the last 25 years (Table 2).

A characteristic feature of the ethnodemographic development after regained independence is the decrease of the population (depopulation) both the titular ethnicities and minorities. The total number of population in the Baltics decreased from 7.93 million in 1990 to 6.22 in 2016, or by 22%. Thus, the Baltic States have the fastest decline of population in the Baltic Sea Region (Zvidriņš P. and A.Bērziņš, 2014) and one of the highest population loss in the world. According to the 1989 and 2011 censuses, the population of three titular ethnoses has decreased from 5.32 million to 4.75 million, or by 11% but the population of different minorities has decreased more substantially (by 37%). At the beginning of 2016, in the Baltics lived almost 2.6 million ethnic Lithuanians, 1.2 million ethnic Latvians and about 900 thousand ethnic Estonians.

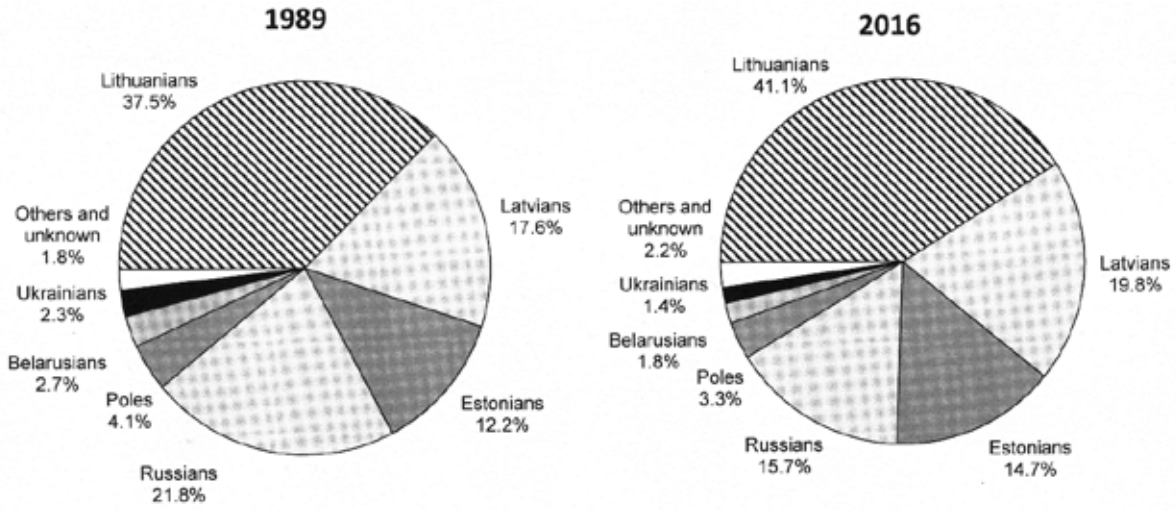
Table 2

Ethnic composition in the Baltics in 1989-2016 (in thousands and %)

Ethnicity	1989	2000	2011	2016	Change 2016/1989	% Change 2016/1989
Lithuanians	2 961	2 943	2 590	2 539	-422	-14
Latvians	1 395	1 376	1 260	1 221	-174	-12
Estonians	967	933	905	908	-59	-6
Russians	1 725	1 274	1 060	970	-755	-44
Poles	321	297	249	205	-116	-36
Belarussians	211	157	123	113	-98	-46
Ukrainians	185	115	88	85	-100	-54
Jews	40	17	12	10	-30	-75
Finns	17	12	8	8	-9	-53
Romanies	10	11	9	7	-3	-30
Tatars	14	9	7	7	-7	-50
Germans	9	9	7	7	-2	-22
Others and unknown	51	79	96	94	43	84
Total	**7 906**	**7 232**	**6 414**	**6 174**	**-1 732**	**-22**

Source: National statistical offices. Calculation of the authors

As a result of ethnically selective migration movements and cardinal changes in nature of population reproduction in the past 25 years, the proportion of minorities' population in all three states has decreased while proportion of titular ethnicities has increased (Figure 2). However, the share of titular ethnicities is much lower than before World War II and in Estonia even slightly lower than in 1959.



(Source: National statistical offices. Calculation of the authors)

Figure 2. **Ethnic composition in the Baltics in 1989 and 2016**

The share of population for minorities which formed one-third of total population in the Baltics in 1989 has decreased to one-fourth with a clear tendency to further drop. However, the proportion of minorities is still high in comparison with many other countries, particularly in Latvia (38% in 2016, in capital city Riga 54%).

Characteristics of The Minorities

The largest ethnic minority by size in every Baltic State is Russians. Their total number within intercensuses period (1989-2011) decreased by one-third (almost by 660,000) and during the first decade of this century - by one-fifth (by about 200,000). However, their numerical strength is still, impressive. The number of Russians (1.0 million in 2016) is only slightly less than the number of Latvians and exceeds the number of Estonians living in the Baltics. More than a half of the Russians residing in the region live in Latvia (504 thousand), 330 thousand in Estonia and about 135 thousand in Lithuania.

The Russians, similarly as Slavic population on the whole, are relatively weakly integrated in the societies therefore much attention in each republic is devoted to build up a common political identity for people living in these countries. This issue still is one of the most pressing, especially in Latvia.

The second largest minority by size is Poles. Their number is about slightly more than 200 thousand and have a tendency to decrease. The great majority (79%) of them reside in Lithuania, about 41 thousand in Latvia and only about 1,700 in Estonia. A relatively high proportion of Poles live in Vilnius and in the Šalcininkai municipality.

The Belarussians are the third largest ethnic minority (more than 110 thousand). In Latvia the Belarussians are even the second largest minority, and in Eastern Latvia (Latgale) they have their local national roots. The majority of them are Russian speakers. They have a negative net migration and natural decrease. Besides, the Belarussian community has decreased due to assimilative processes.

The Ukrainians are the fourth largest minority (86 thousand) and the seventh ethnic group by size in the Baltics. Half of them are residents of Latvia. The Ukrainians are a younger ethnic group and have slightly integrated in the Baltics. Approximately half of them speak mostly Russian and, similar to the Belarussians, about 90% of families are ethnically mixed. The age structure of Ukrainians is relatively young, therefore their depopulation began a little later and it is not as profound when compared to other minorities. They are relatively well educated. Ukrainians living in the Baltic States

were denied Ukrainian citizenship by their officials, and therefore their repatriation to the Ukraine was more marked than of other Slavic ethnicities to their home countries. For that reason the number of Ukrainians who have obtained citizenship in the Baltics is very low.

The number of Jews in comparison with the abovementioned minorities is small (less than 10, 000) and it has decreased substantially during the last two decades. Since the regaining of political independence their number in the Baltics has decreased four times. Large part of them resides in Latvia (5.0 thousand), mainly in capital city Riga. Their fertility rate is very low and an old age structure can be observed; emigration was also extremely high. Among them the percentage of citizens is rather high.

Two other ethnic groups live in the Baltics whose numerical amount is about 8 thousand persons. These are Finns and Romanies. Large part of the Baltic Romanies live in Latvia (about 5,300) while Finns live mainly in Estonia (7,300).

Germans and Tatars are among those ethnicities in the Baltics which are losing people as a result of natural movement and emigration. About 7 thousand Germans and 6 thousand Tatars currently live in Estonia, Latvia and Lithuania. However, in the last five years number of Germans slightly increased.

Each Baltic State has a relatively small number of titular ethnicities of the neighbouring Baltic States. Lithuanians in Latvia make up the greatest number (almost 25,000) but Estonians in Lithuania account for the least number. According to estimates based on 2011 censuses data there are 32 thousand representatives of such minorities from the neighbouring countries which account for only 0.5% from the total population in the Baltics.

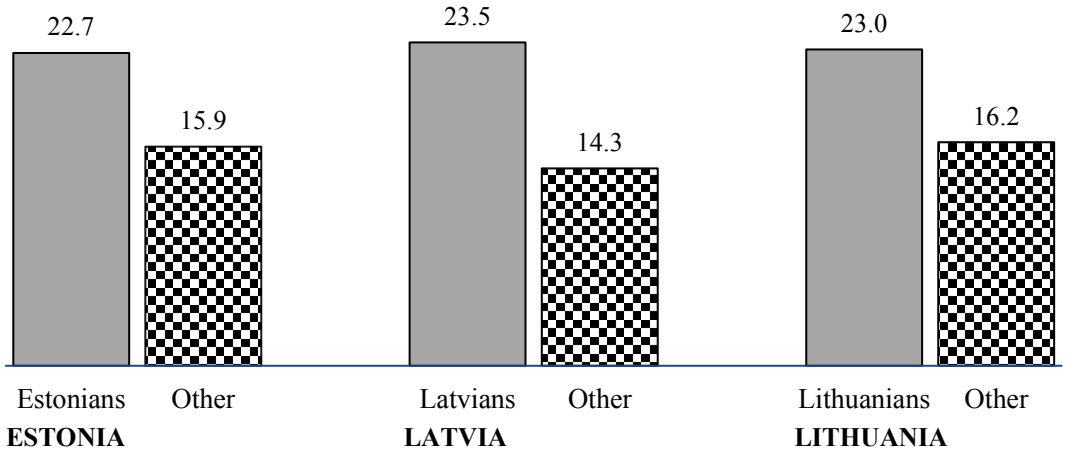
Differentiation in Ethnic Structures and Ageing of Minorities

In all the Baltic States the proportion of the titular ethnicities is rather high in the rural population, particularly in Lithuania and Estonia. In towns the proportion is smaller. It should be stressed that this aspect of studies is complex, particularly in rural areas. The types of linkage between individuals and places of residence are different in each country and changing continuously.

The proportion of non-titular ethnicities is very high in the capitals. In Riga it increased from 55% in 1959 to 63.5% in 1989 and even in 2016 it is more than a half (54%). The proportion of non-titular ethnicities in Tallinn increased from 40 to 53% between 1959 and 1989. In the period of independence the proportion had been steadily decreasing to 45% in 2011 and slightly less at present.

The situation in the capital of Lithuania (Vilnius) was different. The share of ethnic minorities had been steadily decreasing from 66% in 1959 to 49.5% in 1989. The proportion has had a tendency to decrease also in the period of independence, making 37% in 2011.

In Kaunas, the second largest city in Lithuania, the proportion of ethnic minorities is very low (about 6%). Quite different situation is in Daugavpils, the second largest city of Latvia, where only 19% of living there people are Latvians. Censuses data of 2000 and 2011 show that in all the Baltic States the average age of titular ethnicities is considerably lower than among ethnic minorities. Also, the proportion of children in every five-year age group for titular ethnicities is higher than among ethnic minorities, but proportion of old people is higher, especially in Latvia and Lithuania. Very low fertility rate and predominately emigration of younger people advanced population ageing of Slavs and other minorities groups.



Source: Calculation of the authors based on censuses data

Figure 3. **Share of age group 0-19 years among titular and other ethnicities in the Baltic States in 2011 (in percent)**

As can be seen from Figure 3, according data of the last census round, the proportion of children and youth 19 years and younger for titular ethnicity (22.7%) in Estonia was 6.8 percentage points higher than for ethnic minorities. In Latvia and Lithuania this difference was respectively 9.2 and 6.8 points. At the same time the proportion of elderly persons 65 and older among ethnicities was 0.4, 2.0 and 1.7 percentage points lower than those among minorities in respective countries. In terms of population ageing indicators minorities of Baltic States rank near the top of countries in Europe and the world. So-called ageing index measured as the relationship between the number of elderly residents and the number of children among minorities has reached extremely high level. Our analysis based on censuses data of 2011 shows that the smallest value of ageing index (65+/0-14) is for ethnic Estonians (1.05), and the highest for minorities in Latvia (1.90). The ageing index is second highest for minorities in Lithuania (1.78) and second lowest-for ethnic Latvians (1.06).

Foreign – Born Population

The Eurostat Demography Report 2015 (Eurostat, 2015) gives on overview of recent demographic trends in the European Union, including information on non-nationals and foreign-born population. The highest proportion of non-nationals on 1 January 2014 was found in Luxembourg, where they accounted for 45% of the total population, in Cyprus (18.6%), Latvia (15.2) and Estonia (14.8). In the case of Latvia and Estonia, the share of non-nationals is high due to the high number of the former Soviet Union citizens living in the these countries but they have not acquired any other citizenship. The number of recognized non-citizens in Latvia was 254 thousand and in Estonia 87 thousand but citizens of Russia 39 and 91 thousand respectively. Small number of population of Latvia and Estonia are citizens of Ukraine, Belarus and Finland.

Table 3

Main countries of birth of the foreign–born population in 2014

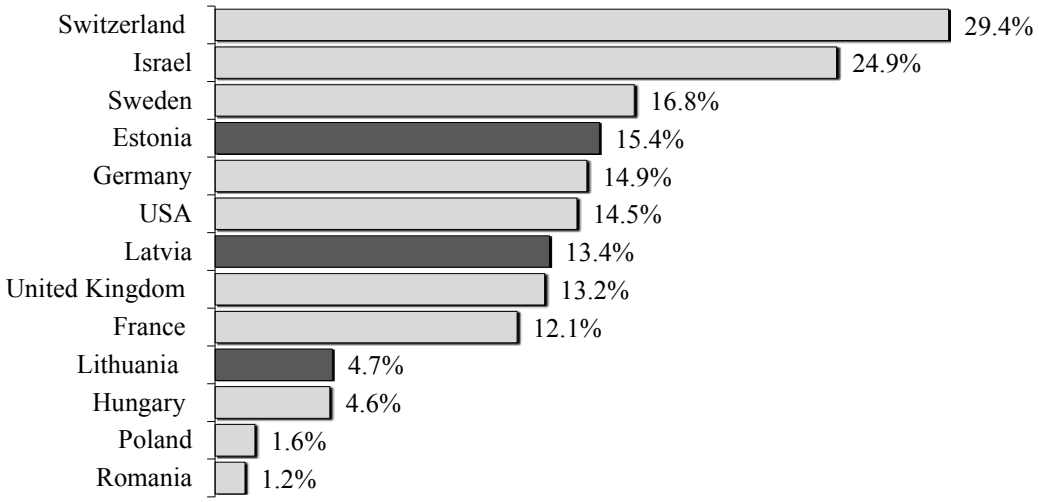
Born in	Absolute numbers (in thsd)	Percentage (%)
Estonia		
Russia	136.4	69.4
Ukraine	21.5	11.0
Belarus	11.5	5.8
Latvia	4.2	2.1
Kazakhstan	4.0	2.0
Other	19.0	9.7
Total	*196.6*	*100*
Latvia		
Russia	140.7	51.9
Belarus	50.0	18.4
Ukraine	34.7	12.8
Lithuania	17.2	6.3
Kazakhstan	6.0	2.2
Other	22.6	8.3
Total	*271.2*	*100*
Lithuania		
Russia	60.1	43.7
Belarus	35.4	25.7
Ukraine	12.4	9.0
Latvia	5.7	4.1
Kazakhstan	4.6	3.3
Other	19.3	14.1
Total	*137.5*	*100*

Source: Eurostat, 2015.

The citizenship requirements in Lithuania, due to more ethnically homogenous population were more liberal than in Latvia and Estonia. In 1989, the Lithuanian nationality law granted automatic citizenship to persons who could establish their own birth within Lithuanian territory, or that of a parent or grandparent. The 1991 treaty with Russia extended the definition of residency to persons who had immigrated to Lithuania between 1989 and 1991. After the ratification of the mentioned treaty applicants were required to meet a set of naturalization criteria, including State language testing.

In Lithuania live only about 22 thousand non-nationals, or 0,7% of total population. Approximately half of them are citizens of Russia. Citizens of other EU Member States amounted to about 4,000 persons. The proportion of non-nationals in the resident population among countries of the EU even lower is in Romania (0.4%) and Poland (0.3%).

United Nations Population Division of the Department of Economic and Social Affairs (UN DESA) provides the international community with accessible population data on migrants stock for all countries. The estimates are based on official statistics about foreign-born or foreign population. For the Baltic States estimates are presented since 1990



Source: UN DESA, 2015.

Figure 4. **Percentage of International Migrant Stock in total population in 2015**

and we have a clear tendency to decrease both absolute and relative figures in each country, more intensively in 1992 when some hundred thousands persons left the Baltic region as Russian (Soviet) army military personnel or their family numbers. According the newest data the number of international migrants in the Baltics decreased from 1.38 million in 1990 to 894 thousand in 2000 and 601 thousand in 2015. As Figure 4 indicates, migrants share of total population reached one-fourth in Estonia and Latvia in 1990 and decreased to 15.4% and 13.4% respectively in 2015 (UN DESA 2015). In Lithuania these indicators were 9.4 and 4.7%. The proportion of migrants in Estonia and Latvia is still high in comparison with many other countries of Europe.

Government Views and Policies on Population Development

All the UN conferences on Population and Development held since 1974 have emphasized monitoring the implementation of their goals and recommendations. The Cairo Conference (1994) recommended that "governments and parliamentarians, in collaboration with the international community and non-governmental organizations, should make the necessary plans in accordance with national concerns and priorities and take the actions required to measure , assess, monitor and evaluate towards meeting the goals of the present Programme of Action" (United Nations, 2004). Using information on government views and policies, the Population Divisions of the UN Secretariat prepared 12 World Population Policies reports on population and development issues in the world and in every country. Table 4 provides the answers of three governments of the Baltic States from the World Population Policies Database (United Nations, 2015).

According to the UN Inquiry among Governments in 2015 all governments in the Baltics considered their population growth to be too low and declared intentions to raise it. The persistence of low fertility was of concern. In terms of life expectancy, the governments considered their mortality and vitality levels to be unacceptable.

Migration is a fundamental component of population growth and spatial distribution therefore the World Population Policies Database covers different aspects of spatial distribution, internal and international migration and additional population variables (indicators). In 2013 (not collected for the 2015 revision), Estonian and Lithuanian governments regarded their immigration and emigration levels as satisfactory. However, government of Latvia considered level of emigration to be too high.

Negative migration persisted throughout the 1990s and in this century. Emigration is the main factor of depopulation. Analyses show that net migration was positively associated with wealth in all Baltic States (Estonian Human Development Report, 2011). Estonia first managed to improve the standard of living and attain close to the zero out–migration level in the first decade of the 21st century.

We should point out that the official data on emigration underestimated the actual situation. The truth about the size of the outflow of population and emigration rates was uncovered after the 2010-2011 censuses and analysis of received results only few years ago. According to assessments by the authors actual out migration in Latvia during the period between two censuses (2000-2011) was 5 times greater than registered figures. Due to a lack of the qualitative statistical data on international long-term emigration the discussion of these issues was almost absent from public debate or state bodies. The real outmigration at the beginning of the 21st century was much higher than published data also in Lithuania and Estonia (Stankūniene, 2009).

It was paradoxical that at the 2005-2011 UN-organized survey of governments in the Baltics officials expressed satisfaction with the emigration processes and hold to non-intervention policies. The extent of economically–motivated emigration increased into the EU labour market in the past 10 years, especially from Latvia and Lithuania. The fraction of ethnic Latvians and Lithuanians among emigrants rose in the second decade of this century. According to recent surveys, adult residents of these two countries perceive emigration as a very big threat (or even the largest threat) to the country and its people.

Table 4

Government views and policies regarding demographic variables in 2005 and 2015

	Estonia		**Latvia**		**Lithuania**	
	2005	**2015**	**2005**	**2015**	**2005**	**2015**
View on population growth	Too low	Too low*	Too low	Too low*	Too low	Too low*
Policy on growth	Raise	Raise	No intervention	Raise	Raise	Raise
View on fertility level	Too low	Too low*	Too low	Too low*	Too low	Too low*
Policy on fertility	Raise	Raise	Raise	Raise	Raise	Raise
View on life expectancy	Unacceptable	Unacceptable*	Unacceptable	Unacceptable*	Acceptable	Unacceptable*
View on immigration	Satisfactory	Satisfactory*	Satisfactory	Satisfactory*	Satisfactory	Satisfactory*
View on emigration	Satisfactory	Satisfactory	Satisfactory	Too high*	Satisfactory	Satisfactory

*2013. *Source: United Nations, 2015. World Population Policies Datasets.*

As can be seen in Table 4 and from analyses of demographic development throughout the 1990s and 2000s all three Baltic States had some similarities, including views on population development and adopted policies. In the past 10 years all Baltic States provide policies to encourage the return of citizens, policies on integration of non- nationals and founded governmental units dealing with diaspora. Return support as a measure more strongly was practised in Estonia, including paying relocation support to ethnic Estonians and Estonian citizens (Kaska, 2012) Individuals of ethnic minorities without citizenship state the smallest propensity to return.

Demographic Factors of Changes in Ethnic Composition

The main aim of the present study is to investigate changes of ethnic composition in Baltics. To reach this aim the following tasks have been set forth to: investigate the differentiation of demographic processes for titular and numerically largest minorities and reveal the role of population reproduction, international migration and partly also ethnic assimilation on the changes of ethnic structure and study specific peculiarities of largest ethnic groups.

Both natural increase and net migration were negative for all titular and major ethnic minorities during 25 years of independence.

As we can see in Table 5, the negative natural change is typical feature for all eight larger ethnoses in Latvia. Only in 2014 and 2015 it became positive for titular ethnicity. In the last 8 years natural decrease of ethnic Russians is three times higher than decrease of Latvians. Similar regularities we could find also in Estonia and Lithuania.

Table 5

Natural decrease of ethnicities in Latvia (yearly average)

Ethnicity	**1990-1999**	**2000-2007**	**2008-2013**	**2014-2015**
Latvians	-4488	-4094	-2503	154
Russians	-4153	-5516	-6418	-5129
Belarussians	-746	-1204	-1382	-1311
Ukrainians	-51	-523	-681	-694
Poles	-591	-666	-744	-638
Lithuanians	-191	-326	-424	-408
Jews	-254	-127	-104	-84
Romanies	79	104	-15	-26

Source: CSB, 2017.

The population has decreased to a different extent for specific ethnicities of every state and periods. Fertility for titular ethnicities was a little higher than for Russians or in the Baltics on the whole. For example, according to the Latvian Fertility and Family Survey data of 1995 average number of children for women in the age group 40-49 years were: for Latvians-1.91, Russians -1.61, Belarussians -1.66, Ukrainians-1.65, Lithuanians-1.79, Poles-1.75 and Jews -1.57. The fertility gap measured with standardized rates has decreased. Similar differences are typical also for Estonia and Lithuania.

One of the most analysed phenomenon is a gap in mortality and life expectancy. The standardized life expectancy for titular ethnicities is higher than for Russians and other minorities. For example, in Lithuania the difference in life expectancy at age 30 among Lithuanians and Russians was 1.8 years, while among Lithuanians and Poles-3.2 years. (Estonian Human Development Report, 2011) In Estonia, the advantage of ethnic Estonians for newborns is even larger. These differences are mostly generated by external causes of death and cardiovascular diseases. However, a small number of studies on health behaviour and vitality do not allow to reveal precise mechanisms that lead to ethnic inequalities in mortality and life expectancy (Krumins J. and D. Ponomarjova, 2016).

The available data on emigration of individuals of different ethnicities are quite ambiguous. There are a few studies on emigration intensity among titular ethnoses and minorities. The econometrist Mikhail Hazans has gathered data from surveys and carried out additional calculations on these patterns in Latvia. He concluded that in the pre-accession period (2000-2003) emigration level of ethnic minorities was higher than among ethnic Latvians. Between 2004-2008, the proportion of non-Latvians among emigrants declined. A substantial part of the minority population without Latvian citizenship was not covered by the legal provisions on free movement of labour at all while during the economic crisis

years in 2009-2010 their intensity of emigration and the proportion (especially holding Latvian citizenship) among emigrants increased (Latvia, 2011; Hazans, 2012).

Forecast Of Ethno-Demographic Situation

Development of demographic projections is among the important tasks of demography. However, projections by ethnicity have been very rare. The issue of ethnicity is very complicated in itself and it is difficult to receive accurate picture of the real ethnic structure of anyone society or country.

With regard to the future ethnic structures in the Baltics, our expectations are that the titular ethnicities and all numerically largest ethnoses will slowly decrease. This situation is likely to persist over next two-three decades. Nevertheless the authors find the Eurostat forecast drop in the Baltics to be excessively pessimistic. Thus, the latest updated projections prepared by Eurostat (base year 2015) forsee very high speed of population decline in Latvia from 1.99 million in 2015 to 1.60 million 2040 and 1.28 million in 2080. Calculations for Lithuania are even more pessimistic: projected figures are 2.13 million for 2040 and 1.66 million for 2080. Only for Estonia the forecasted decrease is slower: from 1.31 million in 2015 to 1.14 million in 2080 (Eurostat, 2017). More optimistic scenarios for Latvia and Lithuania might be obtained from forecasts by UN Population Division published in 2015 (United Nations, 2015). However, even according to this international organization projected total population the size of all three titular ethnicities and largest ethnic minorities will gradually decrease. Only for Estonians it might be a relatively slight decrease.

The share of ethnic Estonians, Latvians and Lithuanians in all the three states most likely will increase, particularly in Latvia and Estonia, because of their relatively higher fertility and vitality (life expectancy), partly their assimilation of minorities having a weak sense of ethnic identity, and higher part of returning home nationals. The proportion of Slavic population and other numerically larger non-titular ethnicities will continue to decrease gradually due to lower level of vitality, out-migration or even natural assimilation. Very high is their ageing level increasing rate of depopulation.

The number of citizens of other EU member states residing in the Baltics has risen following accession to the EU, however, their absolute numbers in every Baltic country are small. There is reason to expect further increase of such individuals as well as increase of persons with unknown ethnic identity.

Conclusions

1. The regaining of political independence in Estonia, Latvia and Lithuania in the beginning of 1990s cardinally changed the directions and intensity of population reproduction and migration.
2. The Baltic States from countries of immigration in the Soviet period became countries of emigration, especially since joining the European Union.
3. Natural movement balance is distinctly negative in all the Baltic States, and the greatest population losses are among minorities (Russians, Poles, Belarussians, Ukrainians and others).
4. The total number of titular ethnicities (ethnic Estonians, Latvians and Lithuanians) has decreased, however, their proportion has increased.
5. During the period of independence every Baltic State has become ethnically less diverse, however, Latvia is the most ethnically diverse country in the EU.
6. The scenarios of depopulation prevail in demographic projections in the Baltic States, profoundly for ethnic minorities.

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