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**CONTEMPORARY ISSUES IN
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AND MANAGEMENT**

**Editor
Verica Babić**



**FACULTY OF ECONOMICS
UNIVERSITY OF KRAGUJEVAC**

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AND MANAGEMENT**

Edited by

Verica Babić, Ph.D.

**FACULTY OF ECONOMICS
UNIVERSITY OF KRAGUJEVAC
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PREFACE

The Proceedings is the result of the fifth biennial International Scientific Conference on *Contemporary Issues in Economics, Business and Management* (EBM 2018), organized by the Faculty of Economics – University of Kragujevac, on 9th and 10th of November, 2018. The Conference provided an opportunity for all those interested in various fields of economics, business and management to discuss their research and to exchange ideas. This year, we brought together about 120 young and experienced researchers, PhD students, post-doctoral researchers, academicians, and professionals from business, government and non-governmental institutions, from ten different countries, i.e. Republic of Serbia, Poland, Russia, Spain, Germany, Slovenia, Japan, Croatia, Republic of Bosnia and Herzegovina, Hungary. The Conference EBM 2018 included plenary session and five parallel sessions. As distinguished researchers in the appropriate fields of economics and management, the keynote speakers at the Conference were as follows: Darko Tipurić, Boris Begović and Vadim Kufenko.

Taking into account complexity and diversity of contemporary issues in economics, business economics and management, the Proceedings of the Conference consist of following sections: *Key Issues in Management and Marketing, Globalization and Regionalization, Accounting and Business Finance and Applied Informatics and Quantitative Methods in Economics and Management*.

First section dedicated to *Key issues in management and marketing*, encompasses the papers highlighting different relevant topics and areas of research, such as knowledge management and its application to diverse organizations, organizational design and learning and their implications for knowledge management, internal and external mechanisms of corporate governance, factors and drivers of innovation management and entrepreneurship, as well.

Taking into account contemporary research models and results of empirical studies, the second section dealing with *Key issues in management and marketing* involves the papers in which various aspects of human resource management, corporate social responsibility, digital marketing as well as Industry 4.0 were considered. Particular attention was given to protection of data in the area of mobile commerce.

The section *Globalization and regionalization* is focused on considering the key economic challenges in the Republic of Serbia and the Western Balkans region, such as: economic development, macroeconomic stability, stability of financial system, state and perspectives on financial market development, competitiveness, innovativeness and efficiency of economic policy. The importance of reconsidering the current macroeconomic paradigms aimed to achieve sustainable economic development is particularly emphasized.

Papers within the section *Accounting and business finance* are generally dedicated to diverse aspects of contemporary financial management of modern corporations, and particularly to the role of managerial accounting instrumentarium in modern business environment, as well as on the importance of alternative approaches to budgeting, such as zero-based budgeting and rolling budgeting.

In the section dedicated to *Applied Informatics and Quantitative Methods in Economics and Management*, the papers consider application of modern informatics and quantitative methods, models and techniques, such as text clustering methods, evolutionary algorithms for complex optimization problems, artificial neural networks for determination of technology acceptance model parameters, DEA method, contemporary approaches to digitalization in managing the cadastral data based on blockchain methodology, as well as the application of modern information systems.

A high number of participants at the Conference are a good indicator that the Conference EBM 2018 offers a great opportunity for scholarly exchange and networking. All the papers have been reviewed and we hope that these Proceedings provide valuable knowledge for academics, professionals and students. Therefore, we would like to thank to all authors who have contributed to the success of the conference in our common response to the above challenges.

Editor

Verica Babić

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**KEY ISSUES IN MANAGEMENT
AND MARKETING 1**

KNOWLEDGE MANAGEMENT IN ORGANIZATIONS – CASE OF SLOVENIA

Zlatko Nedelko¹, Marina Latukha², Maria Volkova³, Vojko Potočan⁴

Abstract: *The main purpose of this paper is to outline current level of knowledge management utilization in organizations in Slovenia and worldwide. In organizations, which operate in nowadays knowledge society, knowledge has become one of the key drivers of organizational success. In that context organizations put a lot of attention to the management of knowledge in order to acquire, use and disseminate knowledge. Literature offers plethora of theoretical discussions about various aspects of knowledge management in organizations, while the empirical examinations about knowledge management utilization in organizations are limited. The distinguishing feature of our paper is that utilization of knowledge management tool is considered in the context of other commonly used management tools in organizations. Keeping in the research most commonly used management tools in organizations, gives us holistic insight into knowledge management tool utilization in organizations. In this paper the focus is on current utilization of knowledge management tool in organizations, since the extent of knowledge management tool utilization significantly influence on the amount of available and gathered knowledge, which is then available in the organization for further dissemination. The paper first emphasizes the role and importance of knowledge management in nowadays organizations. Next the focus is on knowledge management utilization, where first is outlined management tools utilization worldwide. In the empirical part, management tools utilization in Slovenia is outlined. An overview of the researches of management tools, including knowledge management, reveals that knowledge management is not among top used management tools worldwide and well-developed areas, like North America and well-developed parts of Europe, while knowledge management is higher ranked in emerging economies from Central and East Europe (i.e. case of Slovenia) than other areas, like North America, Latin America, well-developed part of Europe. Results from our calculations, based on 342 responses from employees in Slovenian organizations, reveal that knowledge management is not among most used management tools in Slovenian organizations. In aggregated sample of manufacturing and service organizations is knowledge management ranked 7th, in manufacturing organizations 3rd, while in service organizations 8th. The final section of the paper outlines some starting points for discussion and practical implications for manufacturing and service organizations, as well as emphasizes future research steps.*

Keywords: *Management tools, organizations, knowledge management, Slovenia, international comparison.*

JEL Classification: *M 00, M 10, M 19*

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INTRODUCTION

Knowledge has been important for many decades, not only in organizational settings. In the last couple of decades, the crucial importance of knowledge for organizations and their success has been clearly emphasized through the adoption of learning organization and emergence of knowledge society (Carayannis & Grigoroudis, 2016).

In current environment the management of knowledge is crucial to success of organizations (Bruton et al., 2007; Daft, 2015). Employees have become most valuable asset in organizations and an important source of organizations' competitive advantage (Ashton & Morton, 2005). In that frame organizations must assure that they attract best available employees and continuously develop their employees. In such circumstances knowledge management – and its key activities of acquisition, storage and dissemination (Becerra-Fernandez et al., 2004) – have become of crucial importance in the process of organizational learning. Thus, in nowadays knowledge society there is increased need to accumulate knowledge in organizations in order to be better prepared for contemporary challenges, with which are organizations faced every day.

In such circumstances, the role of knowledge management has become crucial for future competitiveness of organizations (Carayannis & Grigoroudis, 2016; Klafke et al., 2016; Nedelko et al., 2018). Knowledge management can be defined as continuously capture of and share of knowledge across process, geographies, business units and external relationships, as well as among employees (Van Assen et al., 2009).

Ample literature about knowledge emphasizes crucial importance of knowledge and knowledge management in nowadays organizations, operating in knowledge society. Despite abundant literature available, little is known about actual utilization of knowledge management in organizations. Building upon research stream about management tools utilization in organizations (Rigby, 2001; Dabic et al., 2013; Nedelko et al., 2015; Rigby & Bilodeau, 2015), will enable us to determine current level of knowledge management in organization, where knowledge management can be considered as management tool. Mentioned studies report about knowledge management utilization, but the literature does not offer an answer how knowledge management is used in organizations operating in manufacturing and service industries.

With this paper we contribute to the existing literature at least following. First, this paper provides an overview of knowledge management utilization in organizations worldwide, while also considering in the analysis other commonly used management tools in organizations. With such research, a comprehensive picture about knowledge management utilization will be obtained. Second, the paper present utilization of management tools, including knowledge management, in Slovenian manufacturing as well as service organizations, which will offer more accurate picture about utilization of knowledge management in organizations, which operate in different industries. Finally, the paper provides several practices implications and starting points for further discussions.

LITERATURE REVIEW

In this section we outline key theoretical cognitions about knowledge management and starting points for considering knowledge management as a management tool. In the second part we outlined results from studies about management tools utilization, with focus on knowledge management utilization.

Knowledge management

In nowadays organizations, which operate in knowledge society, knowledge management has become one of the key success factors (Bhosale & Kant, 2016; Hernández-García et al., 2016; Klafke et al., 2016; Nedelko et al., 2018). The knowledge management has long history, like

knowledge notation, saving and using, appeared three thousand years ago, when the cuneiform was starting to use. Despite the long history of the practices of knowledge management, the knowledge management theoretical issues have been intensively examined for last three decades (Raudeliūnienė & Radvilaitė, 2014; Klafke et al., 2016).

Based on the definitions of various researches in the field of knowledge management, like Becerra-Fernandez et al. (2004), Chen et al. (2005), Ruževičius (2005), Probst et al. (2006), Kebede (2010), we can summarize following (Nedelko et al., 2018): (1) some researchers emphasized the human resources in the definitions of knowledge management (“intellectual capital”, person abilities management, accent of learning importance and conception “life-long learning” in organization); (2) while other have outlined the importance of the strategic management of knowledge management (effective knowledge management depends on the unit of human factor, technologies and methods and it’s coordination).

The knowledge management is purposeful and systematic management of knowledge processes, methods and means, using versatile knowledge potential, seeking the purpose, solving problems and making effective decisions. The scientists have emphasized that knowledge management, as a discipline, is not limited to the perception “tacit – explicit”. The knowledge management is not management of just individual knowledge. It is a management and based activities of business organization, focused on unique ability, connected with realization of knowledge potential for needs of organization, as well for satisfaction of customers’ demands (Nedelko et al., 2018).

The knowledge management processes are investigating differently. Some scientists are offering four knowledge management processes, and others are offering extended cycle of knowledge management. For example, Becerra-Fernandez et al. (2004) distinguish the complex spectrum of knowledge management components, determining effective knowledge management decisions, as a knowledge management processes and sub-processes, systems, mechanisms and technologies, infrastructure. The knowledge management processes are describing as processes which help to find out, identify, share, apply the knowledge and these processes are divided into new knowledge finding, existing knowledge identification, sharing, knowledge applying processes (Becerra-Fernandez et al., 2004; Becerra-Fernandez & Sabherwal, 2010). Submitted processes and sub-processes by (Becerra-Fernandez et al., 2004) were distinguished integrating the results of such scientists as Nonaka and Takeuchi (1995) (four ways to manage the knowledge – socialization, externalization, internalization, combination) and Nahapiet and Ghoshal (1998) (changing, management, routine). Probst et al. (2006) are offering integrated knowledge management system for managing knowledge resources and based under knowledge management processes: knowledge goals’ determination, knowledge identification, acquisition, development, knowledge sharing and distribution, use, preservation, measurement. Alavi and Denford (2011) have carried four knowledge management processes: knowledge creation, knowledge saving and searching, knowledge transmission and sharing, knowledge use.

Knowledge management as management tool

Organizations use plethora of management tools to support and optimize their working, behavior and performance (Van Assen et al., 2009; Daft, 2015). In that frame organizations use tools to support (1) processes optimization, like business process reengineering, change management programs, (2) relations with their customers, using customer relationship management, customer segmentation, and consumer ethnography, (3) and in other many other areas, like collaboration working, sharing services, etc. Coupled with the requirements of knowledge society (Carayannis & Grigoroudis, 2016), organizations put a lot of effort also on knowledge management in organizations (Bhosale & Kant, 2016; Hernández-García et al., 2016; Klafke et al., 2016; Nedelko et al., 2018).

Researchers have declared knowledge management as a separate theoretic conception and as one of the newest management paradigms (Sutherland & Canwell, 2004; Van Assen et al., 2009). Building upon this, we can consider knowledge management as one of the many tools, which organizations use to support their operations (Potocan et al., 2012; Dabic et al., 2013; Nedelko et al., 2017).

Studies, which consider several or many management tools at once, are very seldom in the literature. For instance, well known is study, which examined 25 most commonly used management tools in organizations worldwide (Rigby, 2001; Rigby & Bilodeau, 2015). They cover many countries (in 2003 the number was 60 countries), over a long period of time (it has been going on since 1993), and included a large number of management tools – the inquiry discusses 25 chosen management tools. Another stream, building upon Rigby's and peers approach, gathered around prof.dr. Vojko Potočan have expanded the number of tools in the survey – more than 30 tools and have focused on transformational economies – i.e. former transition economies in Europe (Dabic et al., 2013; Nedelko et al., 2015; Nedelko & Potočan, 2016).

Management tools and knowledge management utilization worldwide

In this section we outline the results about management tools utilization worldwide, while also considering the knowledge management, as a management tool. Results are summarized in Table 1.

Table 1. Management tools usage in selected worldwide areas and in Slovenia^a

Management tool	Global (2010)	North America	European Union (15)	Asia-Pacific	Latin America	Slovenia
1. Benchmarking	1	3	1	4	3	2
2. Strategic Planning	2	2	3	2	1(t)	8
3. Mission and Vision Statements	3	4	5(t)	3	1(t)	6 (t)
4. Customer Relationship Management	4	1	2	1	6	6 (t)
5. Outsourcing	5	6	5(t)	5	4	1
6. Balanced Scorecard	6	12(t)	8(t)	10(t)	5	9
7. Core Competencies	7(t)	5	8(t)	6	10(t)	3
8. Change management processes	7(t)	9	4	8(t)	9	10
9. Strategic Alliances	9	7	7	8(t)	8	17
10. Customer Segmentation	10	15(t)	12	10(t)	7	11
<i>Social media programs</i>	<i>19</i>	<i>8</i>	<i>17(t)</i>	<i>22</i>	<i>21</i>	<i>16</i>
<i>Total quality management</i>	<i>12</i>	<i>10</i>	<i>15</i>	<i>12</i>	<i>12(t)</i>	<i>5</i>
<i>Supply chain management</i>	<i>11</i>	<i>15(t)</i>	<i>8(t)</i>	<i>14</i>	<i>12(t)</i>	<i>15</i>
<i>Knowledge management</i>	<i>12</i>	<i>17</i>	<i>11</i>	<i>7</i>	<i>15</i>	<i>4</i>

^a Note: Data for Global average (GL) 2010, North America (NA) 2010, European Union 15 (EU) (2010), Asia Pacific (AP) (2010), and Latin America (LA) (2010) are calculated upon results from management tools research (Rigby & Bilodeau, 2009; Rigby, 2011; Rigby & Bilodeau, 2011). Ranks for Slovenia are calculated upon mean values (Dabic et al., 2013). Abbreviation t stands for tight result.

Above outlined results reveal that knowledge management is not in the forefront of usage in North and Latin America, as well as in EU – 15 countries (Rigby, 2011; Rigby & Bilodeau, 2011; Potocan et al., 2012; Dabic et al., 2013; Nedelko & Potocan, 2013). Turning to the other results, they reveal that knowledge management is comparatively most used in former transition economy, namely Slovenia.

Based on above outlined literature review, which emphasized importance of knowledge management in organizations and outlined gaps of this paper, we focus our attention in empirical part of the paper on the examination of knowledge management utilization in Slovenian organization, with focus on distinguishing between manufacturing and service organizations.

METHODOLOGY

Survey among employees in Slovenian organizations was done in 2014. Based on random sampling, we sent a link to an online survey to 2 000 email addresses of employees. E-mail addresses were obtained from official companies' websites. A maximum five emails per organization were sent. We received 357 answers, resulting in 17.85 percent response rate. In analysis were included 342 answers, after elimination of those with more than 5 percent of missing answers and possible indices of pattern answering.

In order to empirically examine utilization of knowledge management in organizations, we used a survey instrument about management tools utilization, including 25 tools (Potocan et al., 2012). The survey consists of three parts, where in first part one are questions related to average uses of practices, in second part questions related to the implementation and future use of practices, and in the third part are demographic data about respondents and organizations.

For measuring utilization of management tools, respondents rated each practice using a Likert-type scale ranging from "I know and use practice" (1) to "I don't know and don't use practice" (3). Among organizational factors, organizational size was measured on a Likert type scale, where respondents had the option from "micro" to "large" organization. Employee position was also measured on a Likert type scale, where respondents had options from "non-supervisory staff" to "top management". While for industry and department respondents choose one answer, from several quoted. Personal factors were measured with selection of gender and filling in age and working years. Employee education was measured on a Likert type scale, where respondents had options from "primary school" to "Ph.D."

In terms of sample characteristics respondents are, on average, 40.31 years old, have on average 16.80 years of working experiences, and works with current organization on average for 9.31 years. The sample used in this research includes 48.2 percent males and 51.8 percent females. In terms of higher education achieved, 7.0 percent have finished secondary school, 59.5 percent have highschool or university degree, while 33.5 has a master's degree. In terms of the current position of respondents in their organizations, 58.5 percent is supervisory staff (of which 10.5 percent is lower, 27.2 percent middle, and 18.1 percent top managers) and 41.5 percent are non-supervisory staff. In terms of departments, 10.7 percent respondents worked in R&D department, 25.0 percent in basic (production or service) processes, 9.2 percent in accounting, 10.1 percent in marketing, 33.6 supervisory position in different departments, and 11.6 in other departments (e.g., human resource, law). Regarding the organizational size, 10.0 percent were organizations, having less than 10 employees, 12.9 percent have between 10 and 49 employees, 32.9 percent have between 50 and 249 employees, and 44.1 percent have more than 250 employees. In terms of the economic sector, 1.5 percent organizations operated in industries in the primary sector, 22.8 percent in industrial organizations in the secondary sector, 58.6 percent in tertiary sector – i.e. in services, and 17.2 percent in quaternary sector (e.g. non-governmental, charity organizations, non-profit organizations).

RESULTS AND DISCUSSION

In order to holistically examine utilization of knowledge management, we outline its utilization in frame of 25 most commonly used management tools in Slovenian organizations. Results are presented as mean values and ranks for aggregated sample, as well as for manufacturing and service organizations in Slovenia. Results are summarized in Table 2.

Turning to our field research of management tools utilization, it is evident that knowledge management in among top ten management tools used. More precisely, in manufacturing organizations is ranked third, while in service organizations eight. High level of knowledge management utilization in former transition economies – which are still lagging behind well-

developed western economies (Nedelko & Potočan, 2016) – may reflect high need of these transforming economies to obtain additional knowledge and/or reduce the shortage of current level of knowledge, comparing to the well developed economies.

Table 2. Management tools utilization in Slovenian organizations

Management tool	All ^a	Rank ^b	Manufacturing ^c	Rank ^d	Services ^e	Rank ^f
Benchmarking	1.69	1.	1.44	1.	1.76	3.
Outsourcing	1.71	2.	1.55	2.	1.75	2.
Knowledge Management	1.90	7.	1.55	3.	2.01	8.
Core Competencies	1.78	4.	1.58	4.	1.84	5.
Total Quality Management	1.93	8.	1.61	5.	2.02	9.
Strategic Planning	1.84	5.	1.62	6.	1.91	6.
Mission and Vision Statements	1.71	3.	1.62	7.	1.74	1.
Balanced Scorecard	2.19	11.	1.86	8.	2.29	11.
Customer Relationship Management	1.84	6.	1.88	9.	1.84	4.
Supply Chain Management	2.24	12.	1.92	10.	2.33	13.
Customer Segmentation	1.96	9.	1.94	11.	1.97	7.
Business Process Reengineering	2.17	10.	1.94	12.	2.25	10.
Scenario and Contingency Planning	2.30	15.	1.95	13.	2.41	15.
Mergers and Acquisitions	2.24	13.	1.95	14.	2.32	12.
Corporate Blogs	2.38	16.	2.05	15.	2.49	17.
Strategic Alliances	2.39	17.	2.09	16.	2.47	16.
Loyalty Management	2.29	14.	2.12	17.	2.35	14.
Six Sigma	2.55	22.	2.18	18.	2.66	23.
Shared Service Centers	2.46	18.	2.22	19.	2.53	18.
Growth Strategies Practices	2.47	19.	2.23	20.	2.54	19.
Collaborative Innovation	2.50	20.	2.29	21.	2.55	20.
Lean Operations	2.65	24.	2.40	22.	2.73	24.
Offshoring	2.58	23.	2.44	23.	2.63	22.
Radio Frequency Identification	2.67	25.	2.45	24.	2.73	25.
Consumer Ethnography	2.55	21.	2.52	25.	2.56	21.

^a Mean values for utilization of management tools for all 342 cases.

^b Ranks for management tools utilization regarding mean values of all 342 cases.

^c Mean values for management tools utilization for employees who are based in organizations operating in organizations in the industry (i.e. secondary sector).

^d Ranks for management tools utilization based on mean values for organizations operating in the industry.

^e Mean values for management tools utilization for employees who are based in organizations operating in various services (i.e. tertiary and quaternary sector).

^f Ranks of management tools utilization based on mean values for organizations operating in various services.

Source: Authors'

Also comparing new field study in Slovenia and the one from existing (Dabic et al., 2013), reveals that utilization of knowledge management is ranked for aggregated sample of manufacturing and service organizations lower than in previous study, while in manufacturing organizations is higher ranked. This reveals that manufacturing organizations need to manage knowledge in order to be successful in nowadays fierce competition. For instance, one of the main reasons for high concern for managing knowledge stems from tight association of

Slovenian manufacturing organizations with organizations operating in well developed market economies – i.e. suppliers in frame of supply chains.

CONCLUSIONS AND RECOMMENDATIONS

We can summarize that knowledge management is more commonly used in Slovenian organizations, than in compared worldwide samples. This could be attributed to the “lagging behind” most developed economies and the need to acquire, store and disseminate knowledge in order to competitiveness of organizations, as well as strong integration of Slovenian manufacturing organizations into global supply chains.

Results from our field study can be beneficial for organizations, since they reveal actual state of knowledge management utilization, as well as other management tools. Especially, they can be useful for service organizations, since overall utilization of management tools is lower than in manufacturing organizations, as well as knowledge management tool utilization is significantly less used than in manufacturing organizations. This gives service organizations plethora of options to further capitalize on improved knowledge management in order to improve their operations, processes and performance. These results could also be a clear sign to multinational organizations, which have or will establish operation in Slovenia, that there is a great tendency to reduce the gap towards well-developed economies, also through the intensive knowledge management.

The importance of managing and gathering knowledge will be magnified also, due to the characteristics of newcomers in organizations. The newcomers in organizations – i.e. the millennial generation – have different significantly different characteristics from those already working in organizations (Ng et al., 2010). For instance, millennial generation is much more prone to change organizations in relatively short time. Thus, it is very important to establish an excellent knowledge management system, which will help organizations to gather all available knowledge and have it available for other employees, as well as newcomers.

A further research should examine also the linkages between utilization of considered management tools with knowledge management tool utilization. This will reveal how also other commonly used management tools support management of knowledge in organizations.

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REMEMBER NOT TO FORGET: IMPORTANCE OF BALANCING ORGANIZATIONAL REMEMBRING AND FORGETTING

Ana Aleksić Mirić¹

Abstract: *Organizational learning and knowledge management research and practice have gone through a remarkable transformation in the last thirty years. A review carried out by Crossan & Guatto (1996) shows that in the 1960s only 3 papers on organizational learning were published, whereas during the 1970s, the 1980s and the mid-1990s, there were as many as 64. In the course of the 2000s, interest in the field of knowledge management is becoming increasingly important (Zollo, Reuer & Singh, 2002). Lyles (2014) states that between 2001 and 2010, ISI/Web of Knowledge journals published 1,926 papers that included "knowledge creation" and "organization" among the key words. As a result, a significant body of knowledge was generated and different disciplinary perspectives were developed: we know much about the nature of organizational learning, different types of learning and learning mechanisms, the learning process itself, etc. However, something seems to be missing from the current discussions on organizational knowledge: the existing research is predominantly focused on learning per se, but real-life practice teaches us that companies don't just learn; they also forget (Holan, Phillips, & Lawrence, 2004; Holan & Phillips, 2003; Hedberg, 1995).*

The easiest way to understand the process of organizational forgetting is to compare it to individuals – intentionally or unintentionally, people forget, usually some issues they regard as less important or unimportant, but, eventually, they sometimes forget even very important things. Organizations also go through the process of forgetting. They forget intentionally or unintentionally, and consequently lose knowledge. An intentional process of organizational forgetting happens often in situations when organizations must unlearn old patterns and previously acquired knowledge to acquire new knowledge and skills (Nystrom & Starbuck, 1984). This comes through the process of intentional organizational "unlearning" (Hedberg, 1995; Starbuck, 1996) and requires both behavioral and cognitive changes and that organizations change their ways of doing business and their understanding of the organization and its ways of functioning in the given environment. The loss of knowledge in organizations in this case comes from a purposefully led action of rejecting outdated ways of doing business. On the other hand, organizational forgetting might also come as an unintentional loss of organizational knowledge, which might happen, for instance, as the effect of some crisis (computer memory crash, loss of documents or systems, unintentional loss of certain repositories, or unintentional loss of knowledge held by individuals). In this case, forgetting comes as an unintentional event which eventually confronts organization with the effects of the resources lost in the process. Forgetting occurs as a result of losing a particular resource in the organizational knowledge base. There are common cases, for example, in the process of organizational downsizing, when, for various reasons, loss of organizational knowledge occurs. Macro challenges inspired by globalization and tremendous development of information technology have changed the world we knew, patterns of organizing, and standards of performance. Organizations have faced the challenge of fast learning. However, far less attention is given to developing organizational capacities to unlearn. In this paper we will discuss organizational forgetting, its practices and importance for healthy business growth.

Keywords: *organizational knowledge, organizational remembrance, organizational learning, organizational forgetting*

JEL Classification: *M10, M12, M19*

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INTRODUCTION

Organizational learning and knowledge management research and practice have gone through a remarkable transformation in the last thirty years. We have progressed significantly from the time when nothing or very little was known about organizations as learning systems. When, in the 1970s, Peter Drucker began to talk about organizations of the future as informatized organizations in which knowledge is a key economic resource, dominant and perhaps the only source of competitive advantages, many have called it into question. Today, fifty years later, our business world is built on the premise that what you know and, if you do not know, if you know who knows, is the key to business success.

Organizations and management theory have progressed from the time when nothing was written about organizations as learning systems, then through modest knowledge generation, to the explosion of academic interest in knowledge and learning. A review carried out by Crossan & Guatto (1996) shows that in the 1960s only 3 papers on organizational learning were published, while during the 1970s, the 1980s and the mid-1990s, there were as many as 64. In the course of 2000s, interest in the field of knowledge management is becoming increasingly important (Zollo, Reuer & Singh, 2002). Lyles (2014) states that between 2001 and 2010, ISI / Web of Knowledge journals published 1926 papers that included “knowledge creation” and “organization” among the key words. As a result, significant body of knowledge is generated, and different disciplinary perspectives are developed: we know a lot about the nature of organizational learning, different types of learning and learning mechanisms, learning process itself etc. However, something seems to be missing in the current discussions on organizational knowledge: the existing research is predominantly focused on learning *per se*, but real-life practice teaches us that *companies don't just learn; they also forget!* (Holan, Phillips, Lawrence, 2004; Holan, Phillips, 2003, Hedberg, 1995).

Macro challenges inspired by globalization and tremendous development of information technology have changed the world we knew, patterns of organizing and standards of performance. Organizations have faced the challenge of fast learning, as the fastness of learning determined their survival; the learning within organization needed to be at least as equal as the level of external changes, if not greater, in order to enable organizational survival. Companies have invested a lot in our recent past to develop organizational capabilities, structures, systems and processes that will enable them to learn fast. However, something seems to be missing in the current discussions on organizational knowledge and learning: the existing research is predominantly focused on learning *per se*, but real-life practice teaches us that *companies don't just learn; they also forget*. In this paper we seek to understand what organizational forgetting is, how it is related to organization's knowledge base and how can organizations develop capacities to unlearn what is not relevant and systematically built organizational mechanisms that will help them forget past behavioural practices and ways of doing things.

ORGANIZATIONAL KNOWLEDGE, KNOWLEDGE TYPES AND KNOWLEDGE REPOSITORIES

Organizational knowledge is the result of the process of learning, as well as the basis for further learning. Burton et al (Burton, Obel, De Sanctis, 2006: 92) define knowledge as “*information that corresponds to a particular context*”. Knowledge is what we know; learning is the improvement of what we know.

Knowledge is strongly related to information: knowledge of any kind is structured and consisted of mutually related and logically connected groups of information. Still, not every piece of information can be recognized as knowledge, but only those that organization understands, can interpret and behave accordingly. By the end of 1990ies and the beginning of 2000 management

literature starts to recognize the three most important knowledge repositories within organizations: people, tasks and tools (Argote, Ingram, 2000). *People* repository of knowledge is represented with the members of organization, their individual knowledge and the knowledge embedded in their social network. *Tasks* represent organizational goals, aims and purposes. *Tools* include all technical components, hardware and software.

Table 1. Relations between knowledge repositories in organization

	People	Tasks	Tools
People	Social networks	It is known who performed a particular task	Who knows how to work with a particular equipment, what programmes and the like
Tasks	It is known who performed a particular task	Routines	What steps are taken to perform a particular task, what tools are used to perform a particular task
Tools	Who knows how to work with a particular equipment, what programmes and the like	What steps are taken to perform a particular task, what tools are used to perform a particular task	Compatibility of technology

Source: Author according to Argote, Ingram, 2000

Argote (1999) as well as others (e.g. Alavi, Leidner, 2001, Zander, Kogut, 1995; Winter, 1997, Anderson, 1983) recognizes that knowledge can be characterized along many dimensions. Winter (1987), for instance suggests a typology which differentiates knowledge as (1) simple and complex, (2) teachable and not teachable, and (3) observable and not observable. Winter's classification of organizational knowledge is very influential and often used by other authors, and at the same time operationalized in the work of Zander and Kogut (1995), which facilitates its application in business. Winter connects different types of knowledge to their potentials to be transferred, stating that some types of knowledge are simple, transferable, observable and independent from the context, whereas other types are rather complex, difficult to observe and transfer, integrated within a context they function in. Anderson (1983), on the other hand considers knowledge as declarative and procedural. A related dimension of knowledge is whether it is declarative or procedural (Argote, 1999 according to Singley & Anderson, 1989). Argote states that "*Declarative knowledge is knowledge about facts—what researchers have termed "know what"; Procedural knowledge is knowledge of procedures or "know-how".*" Know-how implies the accumulation of expertise and knowledge which enables for the individual to do something more efficiently and without difficulties (Kogut, Zander, 1992; von Hippel, 1998 after Birkinshaw et al., 2002).

However, the most influential typology of knowledge is the one given by Polanyi (1966) and further applied and built up by many authors. Polanyi's typology recognizes two types of knowledge: tacit and explicit. The distinction between tacit and explicit knowledge can be made by its characteristic of transferability. While explicit knowledge can be easily transferred through communication, tacit knowledge can be transferred only through application and acquired through practice (Grant, 1996:111). The implicit logic that underlies previously stated is that people usually know more than they can show, explain or say (Polanyi, 1966; Cummings, 2001: 18). Tacit knowledge is embedded within a specific context whereas explicit knowledge is open and easily achievable.

Within literature we can find different explanations for the relationship between implicit and explicit knowledge. Cook and Brown (1999) for instance explain that tacit and explicit knowledge represent two completely different constructs and that one is not the version of the other, nor that one can be easily transformed into another. Other authors build the difference between tacit and explicit knowledge on the basis of their transferability. Grant (1996) states that

while explicit knowledge can easily be transferred through communication; tacit knowledge can only be transferred through the application and acquired through practice. Nonaka (1991) explains that explicit and tacit knowledge are not necessarily mutually exclusive categories, but that conversion of one into the other is possible. In accordance with this he recognizes four modes of knowledge conversion: (1) socialization, (2) externalization, (3) combination and (4) internalization.

ORGANIZATIONAL FORGETTING – THE LOSS OF ORGANIZATIONAL KNOWLEDGE

The easiest way to understand process of organizational forgetting is to compare it to individuals – intentionally or unintentionally people forget, usually some issues they regard to be less important or unimportant but, eventually, sometimes forget even very important things. Organizations also go through the process of forgetting. Organizations also forget intentionally or unintentionally, and consequently lose knowledge. Traditional knowledge management literature views forgetting in a kind of negative context. To cite Argote (1999):

Organizational forgetting has important consequences for organizational performance. If forgetting occurs, organizations will not be as productive in the future as they anticipate. (...) Failure to achieve expected levels of productivity can lead to large problems for organizations. Delivery commitments might not be met. Customers can become dissatisfied. (...) Thus, if forgetting occurs, it is very important for the organization to allow for this forgetting in forecasts of its future productivity. Further, the organization should consider strategies for minimizing forgetting.

Other research (e.g., see Easterby-Smith & Lyles, 2011) argue that forgetting can be functional in organizations. Some explanations of double-loop learning, for instance, suggest that double loop learning can occur only if an organization first unlearns old and previously learned, and only then accepts new knowledge (Hamel, 1991: 97): organizational learning is more behavioral than cognitive process since in order to learn organizations need to change applied ways of doing business which operationally means that they need to change elements of their organization designs: information system, reward system, job designs, job descriptions, authority schemes and so on. Nystrom and Starbuck (1984: 53) explain that “*before organizations will try new ideas, they must unlearn old ones by discovering their inadequacies and then discarding them*” further supported by Martin and Phillips (2003) who stress that forgetting process is just as important as the organizational learning process for achieving a sustainable competitive advantage. De Holan and Phillips (2004) identified four modes of organizational forgetting with two underlying dimensions (1) accidental versus purposeful; and (2) focusing on newly acquired versus previously embedded knowledge, arguing that purposeful forgetting can improve organizational performance.

Intentional process of organizational forgetting happens often in situations when organizations must unlearn old patterns and previously acquired knowledge to acquire new knowledge and skills (Nystrom, Starbuck, 1984). This comes through the process of intentional organizational “unlearning” (Hedberg, 1995, Starbuck, 1996) and requires both behavioral and cognitive changes and organizations change their ways of doing business, understanding of the organization and its ways of functioning in the given environment. The loss of knowledge in organizations in this case comes as a purposefully led action of rejecting outdated ways of doing business.

Unintentional process of organizational forgetting - On the other hand, organizational forgetting might also come as an unintentional loss of organizational knowledge, which might happen, for instance, as the effect of some crisis (computer memory crash, loss of documents or

systems, unintentional loss of certain repositories, or unintentional loss of knowledge held by individuals. In this case, forgetting comes as an unintentional event which eventually faces organization with the effects of the resources lost in the process. Forgetting occurs as a result of losing a particular resource in the organizational knowledge base. There are common cases, for example, in the process of organizational downsizing, when for various reasons, loss of organizational knowledge occurs.

So, having explained this we may post a question: is organizational forgetting on the opposite side of organizational learning? To understand the relationship we will provide some definitions of organizational learning (see also Table 2). Daft and Weick (1984) view learning as a process of interpreting information. According to them, learning does not depend only on how much information we gather, but on organizational ability to process and interpret this information. Burton and Obel (2004: 11) relate the change learning process produces to organizational knowledge. According to them organizational learning is the improvement in the knowledge base of the organization: the continuing update of what we know and how to apply it in the organization. Further, they suggest that organizational learning involves four constructs: knowledge acquisition, information distribution, information interpretation and organizational memory. This comes as a good overture for deeper analysis of the phenomena of organizational knowledge. This approach to organizational learning we can recognize in the work of Duncan and Weiss (1978), as well as in Dutton and Duncan (1981). Quite alike, Nevis et al (1995) define the following learning phases: knowledge acquisition, knowledge sharing and knowledge utilization. Organization can acquire knowledge by accepting as practice what an individual within an organization knows, through its own experience, and on the basis of the experience of other organizations. Knowledge sharing is the process of the same importance as knowledge acquisition is. As much as it is important to build an organization in a way to be able to acquire knowledge, it is also important to enhance it to be capable of sharing that knowledge within its bounds. Of course, in the case of knowledge sharing as in the case of knowledge acquisition there is a difference between individual and organizational level. In case an individual within an organization is the knowledge-holder, he can share knowledge with other individuals within an organization in two basic ways: through direct contact one-to-one and through the application of formal organizational mechanisms of integration by which knowledge of an individual becomes exposed to groups and the organization itself. Some of the mechanisms used for this purpose are formal documents, e-mail communication, web portal, meeting with the aim of sharing information, training and lecturers, and teams. A model of connecting individual, group and organizational learning can be found in Crossane et al (1999:523). They state that the three levels of analysis are mutually connected by means of social and psychological processes within an organization: perception, interpretation, integration and institutionalization. According to these authors, organizational learning is a multidimensional category, which involves individual, group and organizational level of analysis.

Having explained learning as a process, I argue that organizational forgetting is not on the opposite side of organizational learning. If intentionally led and carefully managed, organizational forgetting can be one of organizational processes that contributes to organizational health and enhances further learning; through forgetting, organizations clean unnecessary and outdated ways of thinking and behaviour, and makes room for a new relevant knowledge to be planted.

Table 2: Organizational learning vs organizational forgetting

Definition of organizational learning	Interpretation of organizational forgetting in relation to organizational learning (AAM)
Organizational learning is the process of the development of knowledge base (Shrivastava, 1981).	Organizational forgetting is also a process that can help development of knowledge base by removing irrelevant knowledge.
Organizational learning is a process by which knowledge about action outcome relationship between the organization and the environment is developed (Duncan, Weiss, 1979; Daft, Weick, 1984) Organization learning is the process of improving actions through better knowledge and understanding (Fiol, Lyles, 1985) Organizational learning is the capacity of organization to gain insight from its own experience, the experience of others, and to modify the way it functions according to such insight. (Shaw, Perkins, 1991)	Organizational forgetting can happen as a result of organizational learning, as organization <i>“the organization learns that what worked in one context does not work in another. That is, the organization refines its understandings and elaborates its response repertoires to take into account various contingencies. Rather than purge the past, it is useful to retain it, while recognizing that past experience might not be appropriate for current conditions.”</i> (Argote, 2000 in italic).
Organizational learning is the acquisition of new knowledge by actors who are able and willing to apply that knowledge in making decisions or influencing others in the organization (Miller, 1996).	Organizational forgetting might come as the antecedent of organizational learning, as to acquire new knowledge, organizations must firstly “unlearn” as explained by Hedberg, 1981; Nystrom & Starbuck, 1984

Source: Author

EFFECTS OF ORGANIZATIONAL FORGETTING ON ORGANIZATION

Organizational forgetting can have both positive and negative effect on organization and its performance. Positive effects of organizational forgetting can be recognized in the abolishment of the ways of doing things in organizations and the way of thinking about doing business that are out of date, removal of barriers that prevented innovative and creative thinking, and the refreshment of organizational memory and knowledge base. However, negative aspects can be recognized as well, and they are far more connected to unintentional than to intentional forgetting. Accidental lost of organizational memory might significantly hurt organization and affects its performance in the long run as well as sudden withdrawal of an important individual might call for significant change in plans. Therefore, managers are advised not only to keep their eye on the process of learning and its effects, but to apply slightly modified perspective and manage forgetting at the same time.

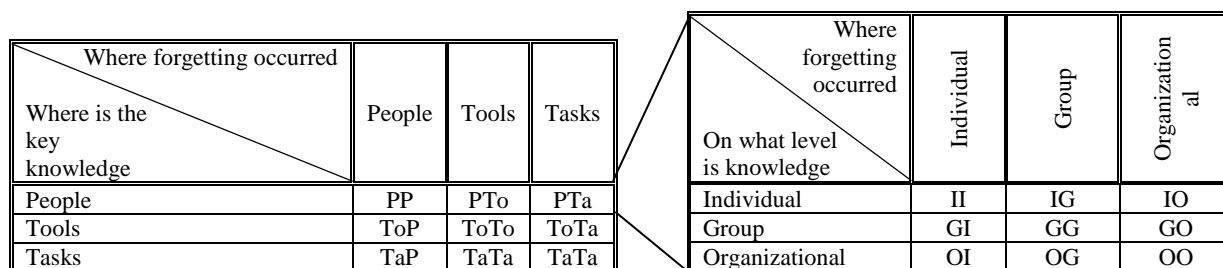


Figure 1: Knowledge repositories

Source: Author

Organization can lose knowledge held by its people, tools or tasks performed. People repository of knowledge is represented with the members of organization, their individual knowledge and the knowledge embedded in their social network. People may leave intentionally or unintentionally, causing changes in individual, group or organizational level. *Tools* include all technical components, hardware and software. They can be changed intentionally or unintentionally – technology can be intentionally changed causing unlearning of the ways organization used to work. *Tasks* represent organizational goals, aims and purposes, which are object of intentional change in most cases, but sometimes can unintentionally slide into some other side, causing changes in organizational behavior. On another dimension, forgetting may hit individual, group or organizational level. Managers should keep focus on these matrices and check which repository and on which level is “hit” by forgetting.

Who should be responsible for managing organizational forgetting and balancing it with organizational remembering?

Managing organizational forgetting and especially balancing between forgetting and learning is not a single position job. It is on a cross-section between at least three positions: executives of the functions, human resource department and those in charge of managing data – information officer, data officer or alike. If, luckily, organization has a position of Knowledge Officer, clearly this falls into that position’s responsibility.

Using key performance indicators for managing organizational forgetting?

Is it necessary for the organization to develop new, specific indicators for managing organizational forgetting? I believe it is not. Organization can quite productively use existing KPIs developed within, for instance, learning and growth perspective as well as human resource perspective in BSC and just look at them from another angle:

Table 3. KPIs that might be used for understanding and balancing learning and forgetting / example /

KPI	Traditional interpretation	Interpretation from the point of balancing remembering and forgetting
Specific weight of expenses on research and innovation in the total amount of expenses	Informs about the expenses on research and innovation in the total amount of expenses.	Follow the level of this indicator for several years. It will inform about knowledge dynamics. Combine with other data to see which practices have been abandoned and how long did their application lasted for.
Resources allocated on research and innovation	Informs about resources allocated on research and innovation.	In particular, follow the number of people involved here.
Number of registered patents	Informs about registered patents.	Compare to number of outdated patents. Compare to certain period in companies history, if there is data. Compare to total number of patents.
Average time company patents are in force	Average time company patents are in force	Will tell us how fast we need to generate new knowledge.
Number of rational and creative ideas per employee	Number of rational and creative ideas per employee	Rational ideas are usually generated from the existing knowledge pool. Creative ideas are usually related to double-loop learning and if brought by existing employees they signify that employees did overcome existing mindset.
Personnel turnover rate	Personnel turnover rate	Who is leaving? Very important to know!

Average employment time in the company	Average employment time in the company	Very important indicator of organizational dynamics.
Annual expense for re-education of personnel	Annual expense for re-education of personnel	Compare to employee survey that evaluates quality of newly acquired knowledge compared to the old one.

Source: Author

CONCLUSIONS AND RECOMMENDATIONS

Traditional knowledge management literature views forgetting in a kind of negative context, while in this paper we added arguments to the understanding that organizational forgetting is not on the opposite side of organizational learning. If intentionally led and carefully managed, organizational forgetting can be one of organizational processes that contributes to quality of the learning process: through forgetting, organizations clean unnecessary and outdated ways of thinking and behaviour, and makes room for a new relevant knowledge to be planted; organizational forgetting can help development of knowledge base by removing irrelevant knowledge. Therefore, organizational forgetting might come as the *antecedent* of organizational learning, which is recognized as “*unlearning*” type of forgetting. On the other side, organizational forgetting can come as a result of organizational learning, as organization learns about its environment and relations with it, improves its understandings and refines response.

Organizational forgetting can have both positive and negative effect on organization and its performance. Positive effects are usually related to intentional forgetting, while negative are usually manifested when unintentional forgetting occurs. Taking care about balancing between forgetting and learning is not a single position job – it might be of primary concern of Chief Knowledge Officer, if organization has one, but usually it cross-sections responsibilities of the three managerial positions: executives of the functions, human resource department and those in charge of managing knowledge and data. To manage organizational forgetting it is not necessary to develop new, specific indicators – it is just necessary to look existing learning indicators from another point of view and understand the whole story they are capable to tell.

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KNOWLEDGE MANAGEMENT SYSTEM IN THE ENTERPRISE AND CUSTOMER KNOWLEDGE MANAGEMENT

Bogusz Mikuła¹

Abstract: *Modern enterprises need to constantly develop their competences to meet market requirements. The development of these competences through the application of knowledge management (KM) and research and development works is insufficient. That is why companies are looking for new competences in their environment, among their suppliers, competitors, research institutions or universities. A still underestimated source of knowledge is the client. While the institutional client can often provide the company with access to important and valuable knowledge resources, the individual customer knowledge is often ignored in assessing the requirements for products or services. Classic Knowledge Management (KM) and Customer Relationship Management (CRM) systems collect information about the client and probably elementary knowledge from the client, but usually do not directly involve the client's potential in the creation of new knowledge. A Customer Knowledge Management (CKM) system adequately fills this gap. The aim of the CKM is to optimize the exchange of knowledge between the company and its institutional and individual clients, and to use their creative potential. In this study, the CKM is defined as the activity consisting in planning, organizing and controlling projects in relation to the knowledge and innovative potential of the client. It is aimed at acquiring and developing customer knowledge by combining it with the knowledge of the company, and also creating new knowledge together with the client for the improvement of the company's activity and creation of innovative solutions, products and services. The implementation of a CKM in an enterprise requires a specialized adaptation of the knowledge management system (KMS). Here, the KMS is defined as a set of principles, methods, means, knowledge (including information), people and their interrelationship networks, which allows to adopt and implement knowledge management strategies, functions and tasks in order to achieve the organization's goals. Based on this definition, the KMS components were characterized, i.e.: people, a network of relationships, knowledge resources, instruments and methods as well as knowledge management principles. Next, the principles of choosing the CKM implementation style were discussed depending on the adopted strategy of personalization or codification. It has been established that prosumerism and/or communities of creation should be used in a KMS based on the codification strategy. In a KMS based on personalization strategy - team-based co-learning, mutual innovation and/or joint intellectual property. The CKM focuses on the processes of: 1) acquiring knowledge about the client, 2) acquiring knowledge from the client, 3) transferring knowledge to the client (sharing knowledge, disseminating knowledge and/or sharing knowledge with the client), 4) co-creating knowledge with the client. In relation to these processes, some useful ways of their implementation have been discussed, including the level of suitability of the CRM system.*

Keywords: *knowledge management, knowledge management system, customer knowledge management, customer relationship management.*

JEL Classification: *D83, L14, M19, M21, M31, O31*

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INTRODUCTION

In today's business, success is based on the ability to adapt the activity to the conditions and requirements of a knowledge-based economy. It is therefore necessary to recognize knowledge as a key resource of a company, which determines how to acquire and use the remaining necessary resources. This translates, among other things, into the creation and use of advanced technologies, including information and communication technologies. But that's not all. It is necessary to introduce knowledge management, aimed at implementing the organizational process of creating knowledge, efficiently and effectively. For this purpose, a knowledge management system needs to be implemented, and knowledge employees should be acquired and involved in the work. To properly direct the process of organizational knowledge creation, a company must acquire the skill to sense what the society thinks, feels and wants. This may be the basis for success in creating new products and successfully introducing them to the market. Attempts to rely research and development processes on ideas coming only from within the company, and imposing certain solutions on customers usually fail. In the 20th century, this strategy was unsuccessfully tested, among others, by American companies. Therefore, recognizing the client's needs seems a key issue. For this purpose, enterprises invest in customer relationship management systems, and in their development. However, it turns out that nowadays these actions may be insufficient in the pursuit of competitors. Of course, one should still listen to customers, because they are increasingly intelligent and smart. However, a single smart and dissatisfied customer can prevent tens or hundreds of customers from purchasing a given product at the local level, and potentially thousands of customers globally. The reasons may of course vary, nevertheless, due to the increase in the wisdom of clients and their increasingly frequent specialist knowledge, conscious entrepreneurs and managers have focused on the use of client knowledge and their potential to create new knowledge.

This study presents a complex problem related to defining the Knowledge Management System, and a proprietary approach to it, presented both in a narrow and broad aspect. Next, the essence of Customer Knowledge Management and the basic styles of its implementation are described. The most important part of the study is the presentation of requirements for the Knowledge Management System of an enterprise in which the Customer Knowledge Management System is to be used. First of all, reference was made to the principles of knowledge management, company knowledge resources, knowledge management tools and knowledge management methods. Also, several practical applications have been derived with respect to the operation of the Knowledge Management System and Customer Knowledge Management.

LITERATURE REVIEW

Knowledge Management System

The theory of knowledge management (KM) does not provide uniform definitions of many basic terms (Tabaszewska, 2011). This is also the case with definitions of the Knowledge Management System (KMS).

Probably the most common approach method to the KMS in the subject literature is to define it as an information management system, or the organization's computer information and communication system. For example, M. Alavi and D.E. Leidner (1999) refer the name KMS to a class of information systems. In this approach, the objective of the KMS is to support construction, sharing and application of knowledge in organizations. L. Damodaran and W. Olphert (2000) define KMS's as "information systems which are perceived as facilitating organizational learning by capturing important (content and process) knowledge and making it available to employees". According to F. McKenna (2008), the KMS is "an information management system with all the tools required to help an organization turn information into

knowledge". He defines the KMS as one that: 1) provides the user with the explicit information required, in exactly the form required, at precisely the time the user needs it, 2) connects to all sources of knowledge, 3) converts data into information and then facilitates the conversion of information to knowledge. U.S. Aktharsha and H. Anis (2011) refer the KMS to a comprehensive information and communication technology platform used for KM in the organization, supporting the creation, interception, storage and dissemination of information. However, according to R. Maier (2002, p. 76) a KMS is "an Information and Communication Technologies (ICT) system in the sense of an application system or an ICT platform that combines and integrates functions for the contextualized handling of both, explicit and tacit knowledge, throughout the organization or that part of the organization that is targeted by a KM initiative".

The presented approaches aim to identify a KMS with an ICT-based information management system. This is probably a legacy of the growth in knowledge based systems in the eighties and early nineties, and has led to much of the early work on KM focusing on the delivery of technological solutions. While it is now recognized that good KM does not result from the implementation of information systems alone, the role of ICT as a key enabler remains undiminished (Carrillo, Anumba & Kamara, 2000).

L. Damodaran and W. Olphert (2000) noticed the need to define the KMS more broadly, as more than an ICT-based system and pointed that the KMS must be a sociotechnical system which has as its objective the management and sharing of knowledge to support achievement of organizational goals. These authors note that by this socio-technical definition the KMS comprises the knowledge itself, sometimes referred to as the intellectual capital of the organization, as well as organizational attributes (including intangibles such as culture), policies and procedures, and some form of an electronic storage and retrieval system. Z. Chen and X. Xu (2010) define the KMS as a system based on information technology that includes intangible elements, such as organizational culture, apart from the tangible elements of the organization, such as IT hardware. In addition to organizational culture, the researchers attribute particular importance to interpersonal relations and methods of knowledge transfer in the KMS. In contrast, C. Soo, T. Devinney, D. Midgley, A. Deering (2002) consider the basic and particularly important components of the system to be: a database subsystem (allowing to quickly get the right information), an organizational language subsystem (allowing to understand the meaning of things), and a networking subsystem (allowing to acquire information and knowledge from internal and external sources), a transfer subsystem (allowing knowledge to be transferred between people or, as a result of a rare combination of information, new knowledge to be created from an individual resource of experience). Among the universal KMS elements J. Beliczyński, Cz. Mesjasz and A. Stabryła (2009, p. 198) listed: knowledge sets (databases and data/knowledge banks), networks of relations, knowledge transfer methods, IT systems, such as MRP/ERP, IT networks (Internet, extranet, intranet), semantic systems (the organization's jargon and the KMS language), and the organization's culture.

In summary, KMS will be understood narrowly and broadly. In a narrow sense, it is a system platform created by information and communication technologies. It supports the implementation of all operational tasks of KM, i.e. processes involving knowledge, in particular transfer, collection, identification and selection, recording and storage of knowledge (Mikula, 2012, pp. 15-16), but also planning, organizing and controlling these processes. In a broad sense, it is a system of resources and factors that allows adopting and implementing strategies, functions and tasks of KM to achieve the organization's goals.

Customer Knowledge Management

Unfortunately, until recently marketing and Customer Relationship Management (CRM) practices have not been able to capture knowledge from clients that comes from social interaction

with the company's employees (García-Murillo & Annabi, 2002). The modern client, on the other hand, is an intelligent person (regardless of whether they are individuals, or represent an institution). They can generate knowledge about the products and services used. At the same time, they often have an extensive creative potential. So why not reach for these resources? This idea is used by Customer Knowledge Management (CKM).

The CKM is commonly defined as a combination of KM and CRM (Belkahla & Triki, 2011). It is even indicated that the aim of the CKM is to integrate KM and CRM (Bueren et al. 2004). The CKM changes the classic role of a client into a subjectified knowledge partner. It involves gaining, sharing and expanding the client's knowledge for the benefit of him and the company (Gibbert, Leibold & Probst, 2002b). In other words, it is a process of generating, disseminating and using customer knowledge, which takes place in the organization and between the organization and the client (Rollins & Halinen, 2005). The CKM is then based on planning, organizing and controlling projects in relation to the knowledge and innovative potential of the client. It is aimed at acquiring and developing customer knowledge by combining it with the knowledge of the company, and also creating new knowledge together with the client for the improvement of the company's activity and creation of innovative solutions, products and services.

M. Gibbert, M Leibold, G Probst (2002a) defined five styles of realizing a CKM. These are:

- prosumerism – in which the client acts as a producer and consumer,
- team-based co-learning – which is building corporate social capital by involving clients in the process of mutual learning, and the aim of which is to reconfigure entire organizations and value systems,
- mutual innovation – which is involving the product's end users in innovative processes,
- communities of creation – which is creating groups of clients with expert knowledge that interact not only with the company, but also with each other,
- joint intellectual property – which enables the company to achieve significant successes for a long time through the education of clients and common ownership as well as continuous development of knowledge. Clients and the company create a future business together, analyzing the scope of joint ventures, co-creating new strategic initiatives and jointly developing knowledge. In fact, the client's success becomes a corporate success and vice versa.

METHODOLOGY

The methodological foundation for this study is the method of analysis and critical evaluation of the subject literature in the field of KM and CKM. The focus was on the contradictions and dependencies that occur between various approaches to the KMS. Next, the focus was on the essence and methods of implementing CKM. Using the comparative method, it was accepted as the procedure task to correct existing views and to find an approach to the KMS that would be adequate to the objectives of CKM and would take into account the idea of its implementation. Using the synthesis method, conclusions regarding the construction of the KMS using CKM were derived.

RESULTS AND DISCUSSION

Theoretical approach to an enterprise knowledge management system

Considering the previously described definitions of the KMS, this system will be ultimately understood in a broad sense as a set of principles, methods, means, knowledge (including information), people and their interrelationship networks, which allows to adopt and implement knowledge management strategies, functions and tasks in order to achieve the organization's goals. Such a definition of the KMS meets the recommendations of P. Meso, R. Smith (2000).

Their research indicates that for a company to be able to derive long-term strategic benefits from a KMS, it should apply a wider socio-technical point of view when developing, implementing and managing a KMS. They suggest that enterprises must take into account not only technology, but also organizational infrastructure, organizational culture and people who create a KMS, and the knowledge to be processed by this system, as presented in Figure 1.

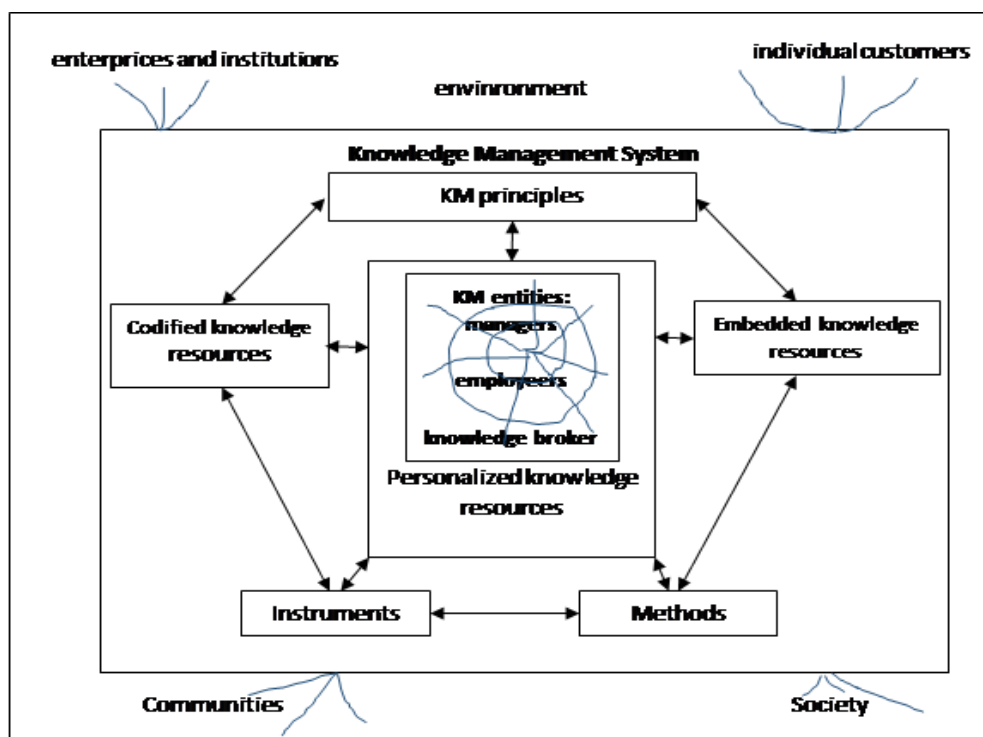


Figure 1: The model of an organization's Knowledge Management System

Source: Author

The heart of the KMS is people: managers, knowledge workers and staff. Their intellectual resources make up the human capital of the organization. It is especially important because they are the carrier of key knowledge used by the company in the personalized form, both explicit and tacit. An important part is played by the knowledge broker, whose task is to make key decisions regarding the KMS and supervise its operation. It may be a one-person position, but a team of specialists in the field of KM and ICT may also act as a knowledge broker. Formal organizational relationships and informal interpersonal relationships create a network of intra-organizational relationships, which is the basis of knowledge transfer processes between people. This network is being extended by the enterprise towards external institutions and enterprises (including institutional clients), and the society, including different types of its communities, as well as individual clients. Next, the KMS is comprised of the codified knowledge resources (created as a result of the codification of personalized knowledge and its supplementation with codified knowledge derived from the environment) and established knowledge resources (created as a result of knowledge depositing in the products of human activity, i.e. in the structural capital, products and services).

Instruments are an important group of the KMS components; nowadays, ICT is widely used for the purposes of implementing processes using knowledge and KM. There are four main types of information systems can be distinguished in enterprises: operational-level systems, knowledge-level systems, management-level systems, and strategic-level systems. The internet, which connects hundreds of thousands of different public and commercial networks from over 200 countries around the world, should also be included. Over 500 million people working in science, education, administration and business use the internet to exchange information or making

business transactions with other organizations around the world (Laudon & Laudon, 2018). All these technologies perfectly support KM in organizations.

Methods are systematic ways of proceeding, and in the last century, hundreds of them have been developed to solve various problems, as part of the science of management. It turns out that some of them can be used in KM. The choice of methods depends on the objectives, KM strategies used and the processes implemented with the participation of knowledge (transfer, creation, etc.).

An important element of the KMS is KM principles resulting from the character of the adopted knowledge strategy, applied KM strategies and implemented operational tasks (processes involving knowledge). These are in addition to principles that help create appropriate conditions within the organization for the purposes of KM. An entire range of them is presented in the literature addressing the issues of the learning organization, intelligent organization, knowledge-based organizations, virtual organizations and organizational behaviors. Examples of these principles are: a) knowledge as a dominant resource, b) continuous learning at an individual level, a team, organization and inter-organizational network, c) forming full trust, d) creating a knowledge-oriented organizational culture, e) excess (redundancy in the field of non-material resources), f) an unambiguous vision of knowledge strategy, g) system thinking, h) knowledge sharing (more in: Krakowiak-Bal et al. 2017b, pp. 197-199).

The broad view of the KMS allows considering it as an original system for the entire enterprise. A KMS is born when the company is founded, and its origins are visible in the design phase of the business model, even if it is a sole proprietorship. In such a case, the KMS is created by the person running the business and include their resources of personalized knowledge, codified knowledge stored in computer memory and documents, the founder's relations with other people, external sources of information and knowledge (available e.g. via the internet), methods and means of implementing processes using knowledge, as well as the principles that govern its operation. As concluded by E. Tabaszewska (2011, p. 116), the development of the KMS is initiated in line with the development of an organization itself, while the act of system implementation is understood as the planned project of implementation of a KM concept and, what follows, the application of KMS instruments, including its organizational specification. Therefore, even if any organization experiences KMS development, not each and every one reaches the stage of implementing the project of formal changes within the framework of KM.

Customer knowledge management as an enterprise knowledge management subsystem

While discussing the use of CKM in the framework of KMS, the first important issue to be considered is the choice of the dominant strategy for the construction of KMS (codification or personalization). This problem was solved by M.T. Hansen, N. Nohria & T. Tierney (1999), who pointed out that if a company produces standard products or uses a business strategy based on mature products, or its employees use mainly explicit knowledge during the implementation of tasks, then a codification strategy should be applied. However, if the products are tailored to the individual needs of the customer, or the company uses a strategy based on product innovations, or its people use mainly tacit knowledge to solve problems, then it is best to apply a personalization strategy. The use of a specific strategy determines the level and the possibility of knowledge codification, the degree of use of ICT tools, the applied KM principles, and the methods used.

As for the basic CKM styles, ICT provides great opportunities for support in the practical use of prosumerism, i.e. it is possible to effectively use the codification strategy. In this case, personalization can be very time-consuming for the customer and the company's representatives. Considering the constant lack of time among high-class specialists, the effective use of communities of creation will certainly require the introduction of a certain degree of codification, especially when these specialists live across long distances and in different time zones. As for

other CKM styles, such as team-based co-learning, mutual innovation and joint intellectual property, the best results should be achieved with personalization. The optimal methods of sharing knowledge and creating new one will certainly be those based on face-to-face meetings. Reversely, in a KMS based on the codification strategy, prosumerism and/or communities of creation should be used, and in a KMS based on personalization strategy – team-based co-learning, mutual innovation and/or joint intellectual property.

CKM focuses on four main groups of processes: 1) acquiring knowledge about the client, 2) acquiring knowledge from the client, 3) transferring knowledge to the client (facilitating, disseminating and/or sharing knowledge with the client), 4) co-creating knowledge with the client (Mikuła 2016). These processes can be implemented in very different ways depending on the needs and capabilities of the company. The first three types of processes can be carried out using a CRM system. It can support CKM in such activities as: 1) creating customer profiles containing their contact details, which have been collected from previous transactions and which can be used in the future for any query; 2) helping in shaping the customer's model providing additional information on consumer behavior, such as when, where and what color of the product they buy; 3) developing various marketing activities, such as promotional campaigns or incentive programs aimed at a group of clients or an individual customer, or a mass marketing project aimed at the entire market (Shannak et al. 2012).

Effective acquisition of knowledge from the client often requires direct contact with them. It is easier to do so in a situation of cooperation with an institutional client. If it is necessary to acquire knowledge from individual clients, one can use simple methods, such as website content analysis. For example, blogs written by home bread-baking enthusiasts contain many comments on both the recipes and ingredients, as well as the devices used. They can be an important source of knowledge for manufacturers of breadmaking machines (because specific devices are often commented in detail on these websites), but also for manufacturers of ready-made blends of baking ingredients, and even producers of frozen bread. Some companies independently create discussion websites and encourage users of a product group to share knowledge with them. They also try to create communities of specialists from different companies, but this is an extremely difficult task. Another very simple method of acquiring knowledge from a customer is to call him after the service has been delivered with a request to answer the questions and comments about its course. For many years, this method of acquiring knowledge from its customers in Poland has been used, for example, by Toyota (but the system doesn't work well and requires improvement).

As part of KM, it is important, among other things, to properly plan, organize and control the course of core processes involving knowledge within the organizational system and between the system and its environs (Krakowiak-Bal et al. 2017a, p. 336). CKM can't be implemented as a "massive attack" of a number of company services in various matters; this can only discourage the client from cooperating. All projects must be integrated in detail during the planning and organization phase. A good solution is continuous cooperation of one of company representatives with the client. Good interpersonal relations and mutual trust can be built thanks to the continuity of cooperation. One can't disregard the right choice of person for the position of a representative working within the CKM. In addition to the appropriate level of knowledge, they should also have psychological characteristics necessary to act in the area of interpersonal relations, well-developed communication skills and courteousness. Effective ways to motivate company representatives and clients must be developed. On the other hand, control should include identification and examination of factors determining knowledge sharing and joint creation of knowledge, along with barriers in this area, as well as pointing to improvement activities. The control should be largely decentralized to the level of the company's representatives, but should also be performed by the CKM manager and the KMS broker.

CONCLUSIONS AND RECOMMENDATIONS

In general, KM is based on acquiring appropriate resources, developing and controlling the use of conditions, strategies, methods and techniques that enable knowledge-related processes, including the optimal use of knowledge resources and their development by incorporating the knowledge resources from the environment into the knowledge conversion.

KMS is a combination of human capital and structural capital components of an organization, so it is a component of organizational capital. KMS is created by processes, relationship networks (formal and informal) within and outside the enterprise environment, as well as methods, technologies and software used, but also databases and documents, knowledge contained in products and services which, together with people and their knowledge, allow implement such important tasks of KM as identifying, transferring, collecting, selecting, creating, combining, saving, storing, assessing and applying knowledge. Expanding the network of relationships with the environment within the KMS, including clients, provides the opportunity to “draw” knowledge from the environment and use the creative potential of the clients. For this purpose, it is worth to use CKM in a thoughtful and appropriately planned way.

Together with CKM, the KMS is worth implementing and developing, because if it works effectively and brings tangible benefits, it also increases the value of the company. Nowadays, lots of experience in applying the CKM idea is generated by the companies in the Knowledge Intensive Business Services sector, and its future result remains most interesting.

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FACTORS AFFECTING INNOVATION DECISION-MAKING: A SYSTEMIC FRAMEWORK

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Abstract: *Many of the problems in managing innovation arise from the complexity and multi-meaning nature of innovation. Thus, of relevant importance is to explore how organizations deal with these complex problems, achieve collective understanding, interpret its environment, and prepare to change. The challenge of innovation decision-making is related to the fact that it is not a simple matter of selecting amongst clearly defined options. The output of the innovation process depends not only on the organization's ability to carry out activities traditionally described as part of the innovation process, but also on decision-makers' ability to deal with various factors determining organizational innovativeness. Interdependence, uncertainty, and complexity of these factors complicate the process of making "right" strategic decisions. Accordingly, as a strategic decision, decision on innovation should be researched as a problem situation, i.e. as a system of complex, interactive, dynamic, and ambiguous problems. To deal with all the situations and problems that may arise in the innovation process, systemic approach for innovation decision-making is needed. We selected System Dynamics, as a relevant functionalist systems approach to management which is focused on the problems that can be modeled as systems, essentially made of different elements and flows, i.e. inter-elementary relations that create feedback loops. The main purpose of the paper is, therefore, to introduce a systemic framework involving selected factors affecting strategic decision-making on innovation and their relationships.*

Starting from different classifications of strategic decision-making factors, we selected the following internal factors: characteristics of decision-makers, such as age, education, working experiences, risk affinity and creativity; organizational characteristics including organizational structure, culture and participation in decision-making; environmental characteristics, such as environmental velocity and volatility. An integration of these contextual domains into a wider framework looks a promising avenue for research. Such a framework must combine the following basic perspectives: an 'individual decision perspective' by characteristics of decision-makers, 'organizational context by organizational characteristics, and 'environmental determinism' by environmental characteristics. Previous theoretical and empirical research findings were the basis for building a System Dynamics' causal loop diagram for connecting the above mentioned factors and their influence on innovation decision-making. This framework can be a valid basis for future empirical research in Serbian enterprises.

Key words: *innovation decision-making, factors influencing innovation decision-making, systemic framework, System Dynamics' causal loop diagram*

JEL Classification: *M10, D81, O31*

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INTRODUCTION

Innovation is widely accepted as the dominant factor in national economic growth and competitiveness. Organizations view innovation as a means toward achieving and sustaining strategic competitive advantages. Many researchers (e.g., Klomp and Van Leeuwen, 1999; Bouchikhi and Kimberly, 2001) consider innovation as the long term key for business success and as the driver of improving domestic economies, through the resolving of socio-economic problems, such as unemployment and productivity growth.

Accordingly, decision on innovations, i.e. innovation decision-making is a very important research area. The paper deals with various factors affecting innovation decision-making in conceptual framework of System Dynamics. In the given context, we choose to apply the tools of Systems Dynamics as one of the systems methodologies for problem situation structuring. These are Causal loop diagrams (CLDs) which enable a complex, integrated and logical framework that allows interaction and interdependence among various factors of innovation decision-making, structured hierarchically or like a network to deal with dependence and feedback. The research aim is to introduce a holistic framework for considering these factors, their interactions and influences on innovation.

Therefore, we focused on the following internal factors: *characteristics of decision-makers*, such as age, education, working experiences, locus of control, risk affinity as well as cognitive conflict including creativity; *organizational characteristics* including organizational structure, culture and participation in decision-making. *Environmental characteristics*, such as environmental velocity and uncertainty are the main external factors.

The paper is consisted of three sections. Within the first section, key features and challenges of innovation decision-making was considered. Then, contextual factors of innovation decision-making was selected and elaborated. Finally, a systemic framework for innovation decision-making was presented.

INNOVATION DECISION-MAKING

Innovation management has become the core competence for modern organizations operating in competitive and global markets. Innovation involves various activities aimed at providing value to customers and a satisfactory return to the organizations (Yesil & Kaya, 2012). In such context, we can emphasize that each successful firm need innovation. However, many firms are facing with financial constraints regarding investing in innovations. Therefore innovation is based on trade-offs and thus management often faces decisions and choices (Braga and Braga, 2013).

The challenge of innovation management can be related to the characteristics of innovations which managers have to contend with, such as managing trade off, dynamics of technology and customer preference, level of details, time pressure, and large economic investment and impact (Yahaya and Bakar, 2004). Exploring the process of decision making, with regards to innovation, seems to be highly relevant for the understanding of the limitations of business innovation; to assess which factors play a role in the process; and why it matters. In addition, innovation capability defined as comprehensive characteristics that facilitate and support an innovation strategy (Wang et al., 2008) is related to a variety of internal and external factors (Lau et al., 2010; Saunila et al., 2014). While innovation capability is a complex concept, some of key factors that influence the ability of organization to innovate are related to decision making process on innovation, such as characteristics of decision makers, organizational culture and changes, networking and relationship building as well as characteristics of environment.

Therefore, both concepts of innovation and decision-making are closely related. This relation has been studied by a number of authors (e.g., Kessler, 2004; Heerkens, 2006, Tid and Bessant,

2009; Braga and Braga, 2013). Organizations cannot afford to innovate at random – they need some kind of framework which articulates how they think innovation can help them survive and grow, and they need to be able to allocate scarce resources to a portfolio of innovation projects. Strategic framework for innovation should be flexible enough to help monitor and adapt projects over time and rigid enough to justify continuation or termination.

The challenge of innovation decision-making is made more complex by the fact that it isn't a simple matter of selecting amongst clearly defined options. By its nature innovation is about the unknown, about possibilities and opportunities associated with doing something new and so the process involves dealing with uncertainty. Effective decision-making and learning in a world of growing complexity and uncertainty requires applying systems thinking in the form of tools for decision-making, i.e. the methods for solving the problems and tools for risk analysis of different decision alternatives. Without systemic thinking, decision-makers might make many oversights due to one-sided behavior (Zlatanović and Mulej, 2015). In conceptual framework of systems thinking, strategic problems or problem situations are researched in the way that systems ideas are used to enable appropriately arranged thinking about real world problems, i.e. to provide decision-makers with appropriate theoretical and methodological support. Therefore, the various systems approaches to problem solving, i.e. systems methodologies for problem situations structuring have been developed. Systems methodologies for problem situations structuring help decision-makers in obtaining the "broader picture" which offers new insights into the problem and possible solutions. In fact, they can help decision makers name the relevant aspects and issues of the considered strategic problems, and frame the context in which the problems are occurred (Zlatanović and Nikolić, 2017).

CONTEXTUAL FACTORS OF INNOVATION DECISION-MAKING

Starting from different classifications of decision-making factors in the literature, we choose the following factors affecting the strategic decision-making on innovation.

Characteristics of decision-makers

Age as demographic characteristics of decision-maker affect his/her behaviour, ability and the way of thinking. Age can influence perception of decision-maker in the process of the problem formulating and strategic evaluation of the alternatives. In fact, we argue that the highly innovative firms had younger managers, i.e. a firm's innovation rate is higher when the decision maker is younger (Souitaris, 2001). Level of education and working experience, i.e., the number of years spent in the company, are important demographic characteristics (Papadikis et al., 1998; Nooraie, 2001; 2012). The level of the education, but not the its type, is positively correlated with the extent of innovativeness. At the same time working experience of top management team negatively influence decision-making process related to product innovation. Regarding the locus of control, Souitaris (2001) found that internal leaders tend to favor innovation more than external leaders. Accordingly, the rate of a firm's innovation is higher when top managers as decision makers has an internal locus of control. Risk tendency is a psychological characteristic of individuals that shows the degree of risk affinity or risk avoidance of a decision-maker (Papadikis et al., 1998). The results of researches confirm that managers with higher tendency towards risk make decisions about innovations faster and with less information. There is empirical evidence of the positive link between risk attitude and innovativeness. In addition, decision makers with internal locus of control have higher risk attitude. Still, the rate of a firm's innovation increases when management has a higher tendency towards taking risks is seen as dominant state (Souitaris, 2001). Also, we indicate negative correlation between age and risk affinity (for instance, younger managers often make decisions with higher degree of risk).

Conflict and creativity present positive force for effective strategic decision-making and it is necessary to stimulate them. Cognitive conflict emerges as a consequence of differences between decision-makers (differences in goals and perspectives of decision-makers), but not as a consequence of personal differences (demographic differences, differences in decision-making styles, etc.). Moreover, cognitive conflict arises from contradictory ideas and thus it can have positive impact on improving innovativeness. However, conflict often slows down decision-making process and leads to communication disruption which negatively influences the outcome of strategic decision-making, as it slows down strategic decisions-making (Zehir and Özşahin, 2008). In fact, although cognitive conflict encourages development of innovative ideas, its impact on innovation decisions is not a priori positive, since it depends on nature of the conflict and the process of its solving. Creativity is another important factor because its use is especially important for innovating, i.e. the activation and development of creativity is understood as a specific thought process, which improves one's ability to be creative. In addition, other authors confirm the importance of creativity as the personal value of the decision-makers to foster innovation decisions (Potočan and Nedelko, 2013).

Organizational characteristics

Organizational structure is defined through following three dimensions: formalization, centralization and complexity. Regarding strategic decision on innovation, the degree of formalization and centralization/decentralization are particularly important. Various authors demonstrated that formalization is negatively related to the strategic decision on innovation, i. e. the rate of a firm's innovation is negatively associated with their extent of formalization. In addition, the centralization offers less opportunity for the new ideas and creative thought (Souitaris, 2001). There is a many different states suggesting that powerful decision makers are able to overcome resistance to change and promote innovations. Therefore, in line with the view that there is a positive correlation between the speed of strategic decision-making and innovation, as well as that a high degree of autonomy promotes faster strategic decision-making (Zehir and Özşahin, 2008), it can be assumed that centralization adds to innovation. However, this issue should be analyzed including the level of decision makers' participation.

In line with above, participation and autonomy can be used to measure the level of centralization/decentralization of strategic decision-making (Andersen, 2001). Participation of numerous decision-makers slows down decision-making process. Accordingly, lower participation is often positively related with innovative decisions (Zehir and Özşahin, 2008). Therefore, the firm's rate of innovation is higher when fewer people participate in the decision-making process (Souitaris, 2001). Still, this view is not completely adopted by some authors, particularly regarding middle managers' participation in decision-making. According to Cheng et al., (2017) middle manager participation in decision-making has a positive effect on firms' innovation. Middle managers can also create social capital and the trust required to foster the corporate entrepreneurial process based on innovation. Furthermore, Sahay and Gupta (2011) found a positive and significant relationship between participation and innovative decision-making, i.e. decentralization is a requirement for firm innovation. This view is supported by the argument that participation through decentralization encourages decision makers to be more innovative. Accordingly, we state that that there is a positive correlation between participation through decentralization and innovation decision making.

Organizational culture refers to a set of basic assumptions that worked so well in the past that they are accepted as valid assumptions within the organization (Martins and Terblanche, 2003). Starting from the view of organizational culture notion, in the literature it is not observed agreement regarding the question of which type of organizational culture encourages creativity and innovation. Some studies relate some elements of organizational culture with innovativeness, but only few quantitative studies confirm positive influence.

Organizational culture affect employee behaviour, learning and development as well as creativity and innovation (Martins and Terblache, 2003). The studies related to the effect of organizational culture on different outcomes are quite extensive, yet, the role of organizational culture on innovation is relatively limited (Yesil and Kaya, 2012). By emphasizing certain values and norms, managers can build an organizational culture that lead to desired behaviors such as innovation (Tellis et al., 2009). The key idea is that the basic values supporting innovation, norms for innovation, and artifacts of innovation lead to innovative behaviors. In line with Hogan and Coote (2014), we state that an innovation-oriented culture should have the following value dimensions: openness and flexibility, internal open communication, competence and professionalism, inter-functional cooperation, responsibility of employees, and risk-taking.

Environmental characteristics

The environment can be defined as a set of external factors, characterized by its uncertainty and complexity, which can cause reflections in the organization (Tsuja and Marinõ, 2013). Another environmental property is the dynamism, represented by the speed and frequency of changes of the environmental variables. Thus, uncertainty, complexity and dynamism are shown as the main features of the organizational environment (Babić, 1995). Environmental dynamism is concerned with the extent of unpredictability of the environment which are reflected in uncertainty of customer preferences, production and/or technology and competitive strategies. Dynamic environment is characterized by the high degree of unpredictability and uncertainty (Mitchell et al., 2011). As in dynamic environment decision-makers often make decisions based on incomplete information, it is necessary to apply adaptive model of decision-making which foster creativity in decision-making. Firms that operate in dynamic environments, where competition change is often and unpredictably, have higher level of innovation, i.e. a firm's rate of innovation is higher when management perceives a higher rate of change of environment (Souitaris, 2001).

Environmental uncertainty refers to possibility to predict events in the environment. Thus, it is associated with dynamism and complexity of the environment. The more complex and changing the environment, leads to the higher level of environmental uncertainty (Freel, 2005). Therefore, the degree of environmental uncertainty is related to innovation decision-making. Bstieler and Gross (2003) examined influence of environmental uncertainty on innovation, i.e. their empirical results confirm that firms in uncertain environment are more innovative. Buganza et al., (2009) has also explored the relationship between innovation and environmental uncertainty in terms of product development and environmental turbulence. Their results show that organizations should apply more flexible development processes when are faced with turbulent environment. This implies that organizations assess the level of environmental turbulence and then try to adapt to the changes.

SYSTEMIC FRAMEWORK FOR INNOVATION DECISION- MAKING

Taking into account variety of the above mentioned factors, their integration into wider framework requires appropriate holistic tools. We have selected to use Causal loop diagrams as the tools of System Dynamics to show how these diverse factors are interrelated and how they affect innovation decision-making.

System Dynamics is a relevant functionalist systems approach to management which is based on the assumptions that system's behavior is preliminary caused by its structure. SD uses different types of diagrams in representing feedback structures: causal loop diagrams, stock and flow diagrams, structure diagrams and policy structure diagrams (Lane, 2008). Causal loop diagrams (CLDs) show orientation of feedback, as well as the key variables and their mutual interactions. Variables are related by causal links represented by adequate arrows. Relations that produce change in the same direction (rising or falling) are marked with a positive sign in the causal loop

diagram (Nikolić et al., 2017). The positive feedback link means that "if the cause increases, the effect also increases above what it would otherwise have been. Also, if the cause decreases, the effect decreases below what it would otherwise have been. Opposite to that, the negative feedback link means that if the cause increases, the effect decreases below what it would otherwise have been; and if the cause decreases, the effect increases above what it would otherwise have been (Sterman, 2000, 139)". Positive feedback loop is known as a 'positive loop' (marked as +), or as a 'reinforcing loop' (marked 'R'). A negative feedback loop is known as a 'negative loop' (marked as -) and as a 'balancing loop' (marked 'B'). So, each relation is characterized by certain polarity, i.e. direction of effect that the influencing variable has on the influenced variable (Lane, 2008).

Basic role of CLDs is reflected in easing communication between decision-makers. Actually, CLDs can be seen as the mediator between verbal description of the problem and the equations that can derive from diagrams. Generally speaking, CLDs are used to represent the set of causal assumptions. By using CLDs, decision-makers can exchange and discuss these assumptions. Actually, CLDs are the tools of thinking which represent individual or team perception of the problem, enable exchanging the assumptions, as well as further exploring the problem through simulation models which can derive from these diagrams. CLDs can be also used to explain the mathematical models, as they can help to clarify why the system behaves differently and why some policies are effective.

Some of the key advantages of using CLDs are as follows:

- Focusing on feedback loops which enables concentration on the key decision-making points and measuring the performance, as well;
- Relative simplicity which is reflected in easy using, since CLDs use constrained set of symbols, such as + or -;
- Delisting details can be attractive to managers who aim to get a strategic overview of a problem.

According to above presented factors affecting innovation decision-making, we presented the following Causal loop diagram which connects these factors and their influence on innovation decision-making. Respecting the above, the Figure 1 shows the following potential mutual influence of decision-making factors, as well as their influence on innovation. First of all, the positive links between the following characteristics of decision-makers: level of education, internal locus of control, risk affinity, cognitive conflict, creativity, and innovation can be observed. At the same time, the link between age of decision-makers and innovation, as well as the link between working experience and innovation are marked as negative. Links between the level of participation and innovation-oriented culture, as organizational characteristics, and innovation are considered as positive. On the contrary, formalization and centralization have negative impact on innovation.

Regarding environmental factors, we point out that environmental dynamism and uncertainty positively influence innovation decision-making; thus these links are positive. In order to holistically represent above-mentioned factors, the Figure 1 shows the following mutual relations between these factors: positive links (cognitive conflict and creativity, risk affinity and internal locus of control, level of participation and innovation-oriented culture; environmental dynamism and uncertainty) and negative links (age and risk affinity, working experience and cognitive conflict, centralization and level of participation).

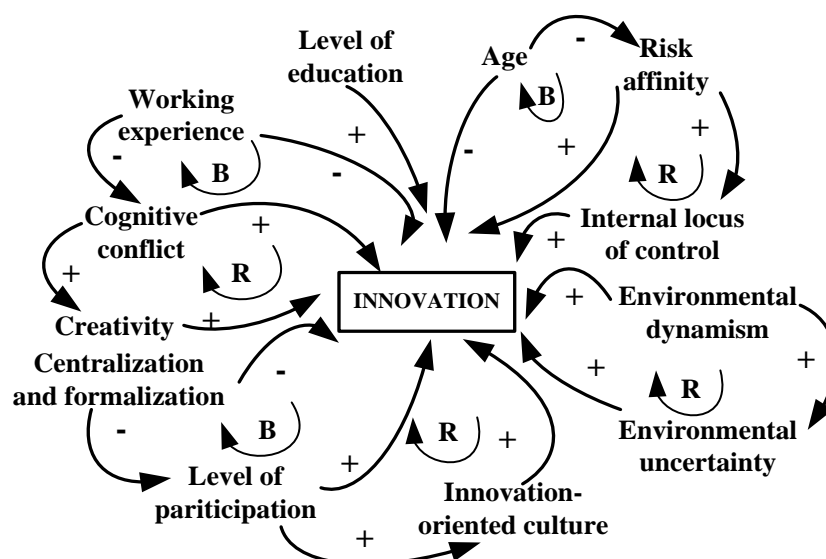


Figure 1: Causal loop diagram representing innovation decision-making factors

Source: Authors

CONCLUSIONS AND FUTURE RESEARCH

Various researchers come up with the conclusions that some factor acts as a stimulant that enhances an innovative behavior among the decision makers. These researches are mostly focused on partial, isolated studies of various decision-making factors. The above indicates the relevant knowledge gap which we tend to overcome with this research. So, we introduced a systemic framework representing various factors of innovation decision-making. By using Causal loop diagrams as the tools of System Dynamics we showed how these diverse factors are interrelated and how they affect innovation decision-making. Presented systemic framework illustrating feedback loops enables decision-makers to focus on the key decision-making points and predict future innovation performance.

Based on these findings, several implications for practice are proposed. First, firms should encourage participation in decision-making, especially participation of younger, higher educated decision makers who are creative, with high level of risk affinity and internal locus of control, since such involvement can improve innovation performance. In addition, firms should stimulate cognitive conflict, i.e. diversity of viewpoints, perceptions and goals. Regarding external context, environmental dynamism and uncertainty foster innovation performance as well.

Taking this into account, the paper offers theoretical and methodological support to innovation-decision making. This can be seen as a main contribution of the paper. However, the paper does not include empirical research results from firms in the Republic of Serbia which is the key limitation of the paper. Still, this framework can be good base for future empirical research of these factors.

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THE CHALLENGES OF KNOWLEDGE TRANSFER IN ORGANIZATIONS IN POLAND – DISCUSSION ON EMPIRICAL STUDY

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Abstract: *The aim of the study is to synthesize the literature overview dedicated to processes involving knowledge with a focus on the transfer of knowledge as a sub-process of managing it. It has been assumed that knowledge transfer as one of the most important processes includes acquiring, circulating, disseminating and sharing knowledge. Using the literature overview, the method of critical analysis was used, focusing on conducting a thorough scientific discussion dedicated to the identification of social determinants of knowledge transfer. Particular emphasis was taken on the conditions for the implementation of knowledge sharing.*

Due to the fact that the available studies on knowledge transfer in the organization did not meet with practical verification of the basic problems of its implementation on the example of Polish organizations, it was decided to undertake empirical research in this area. Therefore, the main objectives of this paper are to determine the conditions of transfer of knowledge in Polish enterprises, to identify the subprocesses of knowledge transfer along with the methods used in their implementation, and to determine the rules of the knowledge transfer recommended for use in enterprises in Poland.

Knowledge transfer is treated as a multi-dimensional process consisting of 4 subprocesses: acquisition of knowledge (acquisition of knowledge from diverse sources, both external and internal), knowledge disclosure (knowledge transfer directed to particular persons), knowledge distribution (advanced forms of sharing of knowledge characterised by a broader sharing range aimed at creation of generally available resources from this knowledge), as well as knowledge sharing (mutual transfer of knowledge by people in the process of communication).

In view of the results of the conducted empirical research, by analysing conditions of knowledge transfer in the verified facilities, it can be concluded that knowledge transfer occurs therein on many levels and takes the form of 4 distinguished sub-processes. In addition, there are convenient circumstances fostering it. Actions are undertaken aiming at shaping the organisational culture based on mutual trust, focused on promoting and supporting knowledge diffusion. Managers in the examined organisations, in everyday behaviours and real attitudes, seem to adhere to standards and values focused on creating an atmosphere of support, respect of the principle of reciprocity, promoting altruistic attitude in sharing knowledge.

As a result, the universal premises of effective management of knowledge transfer in organizations are discussed, in the form of: shaping the optimal technical and social infrastructure of the knowledge environment, taking actions contributing to the evolution of organizational culture towards promoting knowledge and application of main values, superior and detailed principles of knowledge transfer.

Keywords: *Knowledge management, Knowledge transfer, Infrastructure of knowledge environment, Knowledge-orientated organizational culture, Knowledge transfer principles*

JEL Classification: *J24, M12, M54*

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INTRODUCTION

Knowledge management, initiated as early as in the 1960s, saw the greatest heyday as a concept at the breakthrough of the 20th and the 21st century. Completed by resource orientation, it contributed to the perspective change in management.

From the point of view of the knowledge orientation, deliberations are conducted at each level of analysis of economic life. Knowledge management is usually treated as a concept with the largest use at the level of organisation, since an enterprise operating in a knowledge-based economy is more and more often seen as a system processing and using knowledge rather than raw materials into finished products. Therefore, it is emphasised that, presently, access to information and knowledge determines the survival and development of an organisation operating in the knowledge society.

The concept of knowledge management is currently at the stage of development where the message of "knowledge for the future" is taken into account and it is broadly believed that it needs to be democratised. Attention is also paid to knowledge distribution, allowing for its evolutionary development based on creating common contexts, namely the focus is on the process of knowledge transfer. Interdependence of knowledge, its context, content or level of abstraction is the key to diffusion, as one of the main processes it participates in. In consequence, knowledge transfer has begun to be recognised as crucial for the success of knowledge management in implementation in organisations.

Two basic objectives of the paper were assumed – synthesis of literary achievements devoted to knowledge transfer as a sub-processes of knowledge management and identification of determinations of knowledge transfer in Polish organisations on the basis of empirical research.

When using research of the subject literature, the critical analysis method was applied, and an academic discussion was undertaken, focused on capturing the essence and context of knowledge transfer. Based on exploration of empirical data, a challenge was undertaken to indicate the circumstances of knowledge diffusion in Polish organisations, identify knowledge transfer sub-processes implemented therein along with methods used during their course, select primary values and principles relating to knowledge diffusion, and design a model solution covering particular elements of the knowledge transfer system.

KNOWLEDGE TRANSFER IN THE LIGHT OF THEORY

Currently, a new paradigm emerges, being the result of an evolution of views in the field of knowledge management. According to its assumptions, knowledge is a social process rather than a resource, and the dominant strategy should be personalisation and focus on tacit knowledge, while the subject of an in-depth scientific discourse should be, above all, creation and sharing of knowledge, with participation of employees and the social environment of processes involving knowledge (Morawski, 2017, p. 26-29). Hence the intensified interest in knowledge transfer as the main process involving knowledge, in each of the identified aspects.

Already from the very beginning of emergence of the knowledge management concept, knowledge transfer has been grabbing the researchers' attention. Along with the development of theoretical scientific discourse and empirical explorations, theory concerning knowledge transfer has been solidifying. It was assumed that some of the most beneficial strategies of knowledge management are those based on creation and distribution of knowledge. It was also found that, currently, each market player must obtain or create new knowledge, stimulate its diffusion and, as a result, transform it into new solutions, thus generating their own resources of well-established organisational knowledge.

It was thus decided that a company shall be regarded as a system of knowledge distribution (Nogalski, Karpacz, Wójcik-Karpacz, 2014, p. 168), therefore, knowledge transfer is presently usually perceived as a catalyst of effective organisation management (Sinell, Iffländer, Muschner, 2017, p. 1460), a factor that determines the level of company innovation (Luo, Lui, Kim, 2017, p. 2), and the driving force of the contemporary economy (Michalak, Zagórowski, 2017, p. 300), while at the same time defining and analysing in many ways.

It is explained as a process of exchange of tacit or explicit knowledge between two agents, during which one agent intentionally receives and makes use of knowledge delivered by another agent. The role of an agent can be played by a person, a team, an organisational unit, an organisation, or an inter-organisational network (Kumar, Ganesh, 2009, p. 163). It is also defined as all individual or organisational actions undertaken by the addressee in order to identify and obtain potentially useful knowledge generated by its addresser (Al-Salti, Hackney, 2011, p. 455-456). B. Mikuła (2011, p. 64-65) defines this process involving knowledge as a multi-dimensional activity that consists of 4 sub-processes: acquisition of knowledge, disclosure of knowledge, distribution and sharing of knowledge.

Usually, it is thus defined in process terms and should be treated as a process involving knowledge that is the basis for organisational learning, during which an exchange of tacit or explicit knowledge occurs between at least two entities.

In conclusion, knowledge transfer is a dynamic process that requires time, an attitude of readiness for cooperation, and is dependent upon people, quality of their knowledge, as well as openness and flexibility (Leszczyńska, Pruchnicki, 2017, p. 1199). It enables an organisation to develop competences, increase values and maintain a competitive advantage (Al-Salti, Hackney, 2011, p. 457).

Over time, practical explorations of the course of knowledge diffusion were undertaken, in the context of national economies (Dziadkiewicz, Nieżurawska-Zajac, Duarte, Dryl, Dryl, Nieżurawski, Sofia, Pereira, Santos, Ferreira Lopes, 2017, p. 49-61), regions (Sagan, Zalewa, Gorganiuk, Józwik, 2011, p. 85-98), sectors (Dee, Leisyte, 2017, p. 355-365), types of enterprises (Ratajczak, 2006, p. 113-120), or even organisational units of specific companies (Midor, Zasadzień, Szczęśniak, 2015, p. 135-144).

DETERMINANTS OF KNOWLEDGE TRANSFER – THEORETICAL ANALYSIS

Usually, one of the key tasks of those responsible for knowledge transfer management in organisations is to create conditions necessary for effective implementation of this process involving knowledge (Jedynak, 2010, p. 105). Hence, the success of knowledge diffusion in the company is determined by (Skrzypek, 2013, p. 3): greater awareness of the need of development, co-participation and participation, continuous learning, creativity, mutual trust, common goals and interests, the need for thinking, the desire to explore and create, awareness that a place on the market is nowadays determined by intellectual richness.

Therefore, the main determinants of the effectiveness of its course include (Luo, Lui, Kim, 2017, p. 3-4; Dee, Leisyte, 2017, p. 357): the company's capacity for organisational learning, relations between the addressee and the addresser of knowledge, characteristics of knowledge as a resource (viscosity, simultaneity, inexhaustibility, ambiguity), as well as the level of development of the knowledge environment infrastructure.

Some universal premises of effective knowledge transfer management may also be distinguished. These include: shaping an optimal technical and social knowledge environment infrastructure, undertaking activities contributing to the evolution of the organisational culture

towards a direction promoting knowledge, as well as identifying and using in practice the main values, primary and detailed principles of knowledge transfer.

In the case of modelling of the knowledge environment infrastructure, it should be remembered, first of all, that technological conditions stimulating knowledge transfer in the organisation should be secondary to social ones – they are the ones to fundamentally set out the necessary conditions for knowledge diffusion. For instance, the following should be considered the main ones: focusing on the individual, pursuit of meritocracy at the expense of rejection of hierarchy, organisation of knowledge around common practices or appreciation of contribution of work, regardless of organisational boundaries and place in the hierarchy. It is recommended to supplement them with: easy and efficient access to various types of data and information from many diverse databases or intuitive and simple data interfaces (Pralhad, Ramaswamy, 2005, p. 185-186).

An organisational culture promoting knowledge must thus depend on the following organisational solutions as well as basic assumptions, standards and values, such as: a flat, flexible structure, expert authority, informal ways of communication, inter-functional, continuous training and education of employees, evenly distributed responsibility, entrepreneurship, focus on the customer, open door policy, equal opportunities for all employees (Latusek, 2008, p. 180).

The purpose of knowledge transfer is to provide knowledge to those places where it is needed the most (Jędrych, 2016, p. 18), and the knowledge transfer itself requires "knowledge of how to transfer knowledge" (Liyanage, Elhang, Ballal, Li, 2009, p. 124). It also concentrates on instruments that improve it. Taking into account the special character of specific types of knowledge, tools supporting tacit and explicit knowledge transfer should vary (see: Nogalski, Karpacz, Wójcik-Karpacz, 2014, p. 164)

Focusing on sub-processes of knowledge transfer, various methods may be used, relevant for supporting effective implementation of each of them (see: Miłkowska, 2011, p. 66).

The outcome of all those, permanently undertaken, actions should be the creation of a knowledge transfer system as an element of the general system of knowledge management in an organisation, also taking account of the main values as well as primary and detailed principles supporting knowledge transfer in organisations (see: Krakowiak-Ball et.al. 2017, p. 197-199).

METHODOLOGY

Before commencing the empirical research, the general purpose of which was to conduct an initial analysis and diagnosis of determinations of knowledge transfer in Polish organizations, the following research hypotheses were formulated:

- knowledge transfer in organisations occurs in the form of 4 sub-processes: acquisition of knowledge, disclosure of knowledge, dissemination of knowledge, as well as sharing of knowledge,
- businesses operating under the conditions of new economy are usually focused on knowledge,
- knowledge transfer is multi-dimensional and occurs on many levels,
- standards of behaviour binding in companies contribute to the evolution of their organisational cultures towards activities promoting knowledge,
- knowledge transfer in organisations is affected by the existence of general and detailed principles supporting it.

Theoretical presumptions so specified contributed to the selection of specific experimental challenges, in the form of identification of:

- methods and tools used in the companies being verified, supporting the course of each of the distinguished knowledge transfer sub-processes,
- conditions of social and technological knowledge environment infrastructure existing in the examined organisations,
- attitudes and activities managing the explored facilities, stimulating knowledge transfer,
- binding and preferred principles relating to knowledge transfer in the analysed entities.

In order to verify the set hypotheses and to fulfil the research objectives, a survey questionnaire was used, which was conducted in spring of 2018. The research tool consisted of 25 closed-ended questions. Most of them had the form of multiple-choice questions.

As a result, we managed to obtain 168 completely filled-in surveys, and each respondent came from a different organisation - thus, the study had only a pilot and cross-sectional character.

The respondents themselves are employees with average professional experience, with average job seniority at the level of 4 years, and in the organisation described through answers - 2 years. Thus, it could be assumed that the respondents have sufficient scope of knowledge about the verified company by which they are employed.

The analysed organisations represented a diverse business profile (46.3% services, 4.5% public services, 16.4% trade, 10.4% production, 22.4% mixed), and their average period of operation was 24 years. Hence, most of them were experienced companies, operating in diverse market conditions.

In general, organisations with a service-oriented profile of operations (along with public services) constituted 50.8% of the respondents, so the research sample confirms the thesis concerning features of knowledge-based economy, where the services sector assumes the dominant role over production sectors. In consequence, it could be presumed that their functioning is compatible with the conditions of new economy. Knowledge transfer should also occur therein, and its course should be deliberately shaped and controlled. Especially in the case of large entities, and these constituted the majority of the sample.

The researched companies were equally as diverse in terms of size – the research sample was in 20.9% represented by microenterprises, in 23.9% by small, in 14.9% by medium-sized, and in 40.3% by large organisations. They all had a satisfactory (in the opinion of the surveyed) financial position (27.7% of the respondents answered that their organisations are in a very good financial situation, 56.9% - in a good situation, and 13.8% - in an average situation). The stable financial situation of the verified facilities suggested that the examined companies should represent the attitude of openness, demonstrate a greater tendency to take risks, seek new areas of development – function under the conditions of new economy and be focused on knowledge.

RESULTS AND DISCUSSION

In search for arguments verifying the authenticity of the formulated research presumptions, reference was made to specific answers obtained from respondents to particular survey questions.

The respondents confirmed, although not unequivocally, that in their opinion companies they are working for are focused on knowledge (strongly agree – 47.1%; neither agree nor disagree – 39.7%, strongly disagree – 13.2%). On the other hand, they clearly emphasised that knowledge transfer occurs in organisations they are working for (strongly agree – 52.9%; neither agree nor disagree – 32.4%, strongly disagree – 14.7%). They agreed that these companies have the sub-process of acquisition of knowledge (50.7% of responses), disclosure of knowledge (44.8% of responses), distribution of knowledge (26.9% of responses), as well as sharing of knowledge (47.8% of responses).

The respondents successively indicated that diffusion of knowledge, as a process involving knowledge, takes place in many areas. They emphasised the dimension of knowledge transfer at the individual level (occurs constantly – 45.5%, very often – 38.2%), between individual employees and teams (occurs very often – 41.1%), between the company and the environment (occurs often – 41.1% of responses). They confirmed that knowledge transfer rarely occurs between teams of employees (36.8% of responses), as well as between the company and cooperating organisations (32.3%).

During practical explorations, the analysis separately covered tools used in and supporting execution of each constituent element forming the whole knowledge transfer process. First, we looked into the methods of knowledge acquisition, and then the methods of disclosure of knowledge. Later, we selected instruments supporting execution of the sub-process of distribution of knowledge and sharing of knowledge.

The most commonly applied method supporting both the acquisition of knowledge and its disclosure is providing instructions at the workplace (respectively, 51.5% and 78% of responses). Meetings and briefings are commonly used, both as an instrument of disclosing knowledge (54.4% of indications) and sharing it (61.8% of responses). Distribution of knowledge is conducted with the use of the dominant medium in the form of the Internet – 63.2% of responses, advertisement of products and the organisation – 57.3%, as well as specialist publications (36.8%), and speeches during seminars, symposiums and conferences (26.8%).

On the other hand, in the case of the examined companies, knowledge sharing, apart from meetings and briefings, takes place to a great extent by team work training (57.4%), mentoring (56%) and coaching (54%).

The following part of empirical analyses focused on the determinants of the course of knowledge transfer in enterprises. Firstly, we looked into the conditions of the knowledge environment infrastructure. Among them, the respondents indicated attitudes of their superiors aiming at appreciating the work contribution, regardless of organisational boundaries and place in the hierarchy (39.7% of responses). These were the only factors substantially identified by the surveyed that build social infrastructure of the knowledge environment (other factors got chosen by less than 10% of the respondents). On the other hand, in the case of technical knowledge environment infrastructure, the respondents indicated: having the possibility to return to the data, supplement them, add new information and generate new knowledge (42.6% of responses), easy availability of various types of internal data (41.2% of responses), easy and quick access information from many diverse external databases (36.8%).

The conducted investigations into the conditions of knowledge transfer were supplemented by identification of attitudes and activities of the management with regard to knowledge transfer. It turned out that the superiors: encourage cooperation (53% of responses), support and encourage knowledge sharing (47.05%) and create conditions fostering it (42.6%), and finally motivate employees to cooperate (41.2%). At the same time, by supporting employee development initiatives (36.8% of responses), they encourage and inspire employees to act (35.3%) and take active part in the knowledge transfer processes themselves (36.8% of responses).

Furthermore, the respondents indicated additional activities stimulating knowledge diffusion, undertaken by their superiors. These are: shaping of openness in communication by supporting open conversations, informal learning, supporting formation and development of a network of informal relations, supporting familiar relations, affirming transparency in all relations (56% of responses), focusing on building trust (47.05%), showing how knowledge transfer connects with the company's objectives (42.6%), putting people who are able to encourage and infect others with the idea of sharing knowledge and give them any support as heads of projects (42.6%).

The diagnosis of environmental conditions of knowledge and organisational behaviours of the management of the examined units supporting knowledge transfer was a prelude to analyses of the organisational culture of the verified enterprises. An attempt was made to answer a question concerning the condition of organisational cultures focused on knowledge. In this respect, help was to be provided by answers given by the respondents listing standards of behaviour binding in the organisations they are working for and the existing and preferred principles referring to knowledge diffusion (Table 1).

With the task of determining the challenges to be faced by knowledge transfer managers in organisations, guidelines were also provided by responses of the surveyed people. The preferred solutions mentioned by the respondents that, in their opinion, help in knowledge transfer, shed light on further areas of improvement of the implementation of this process involving knowledge. The most often indicated preferred forms of solutions facilitating transfer of knowledge are: marketing research – 35.3% of responses, presentations – 33.8% of responses, instructions provided at the work place and coaching – 32.3%, as well as meetings, briefings and product instruction manuals (30.1%). On the other hand, in the opinion of the respondents, the management should undertake the following actions stimulating knowledge transfer: introduction of a motivational system, encouraging knowledge diffusion (42.6% of responses), enabling development of practitioner communities (41.2%), stimulation of social interactions by encouraging communication, cooperation in the form of networking, establishment and maintenance of friendships (38.2% of responses).

Table 1. Standards of behaviour binding in the examined organisations and preferred by the respondents as well as principles pertaining to knowledge transfer

standards of behaviour binding in the examined organisations			
binding	% of responses	preferred	% of responses
focus "on the customer"	51.5%	"What can I do for you?"	42.6%
informal ways of communication	47.05%	continuous training and education of employees	41.1%
knowledge sharing is a value	42.6%	"open door" policy	39.7%
avoiding risk	41.2%	the principle of "What our customer will gain from this?"	39.7%
power=knowledge	39.7%	equal opportunities for all employees	38.2%
equal opportunities for all employees	39.7%	evenly spread responsibility	36.8%
principles pertaining to knowledge transfer			
binding	% of responses	preferred	% of responses
communication and mutual interactions	58.8%	leaving a place for spontaneous, informal events and behaviour	42.6%
sharing knowledge	53%	high personal positive involvement	38.2%
knowledge as a dominant resource	51.5%	necessary diversity	36.8%
openness	48.5%	natural selection of leaders	32.3%
continuous learning at the level of an individual, a team, the organisation and the network	47.05%	seeking and triggering constructive criticism	32.3%

Source: Author's calculation

CONCLUSIONS AND RECOMMENDATIONS

In view of the results of the conducted empirical research, by analysing conditions of knowledge transfer in the verified facilities, it can be concluded that knowledge transfer occurs therein on many levels and takes the form of 4 distinguished sub-processes. In addition, there are convenient circumstances fostering it. Actions are undertaken aiming at shaping the organisational culture based on mutual trust, focused on promoting and supporting knowledge diffusion. Managers in the examined organisations, in everyday behaviours and real attitudes, seem to adhere to standards and values focused on creating an atmosphere of support, respect of the principle of reciprocity, promoting altruistic attitude in sharing knowledge.

Recommendations that can be proposed on the basis of the presented results are as follows:

- development of knowledge transfer between teams of employees (meso) as well as between companies and cooperating organisations, as well as focus on development of knowledge based on external resources of enterprises,
- intensification of the use of previously unused, more unconventional methods of knowledge transfer taking account of its particular sub-processes (for instance, in the case of acquisition of knowledge – analysis of complaints and group training (which may contribute to the development of the meso level of knowledge transfer), and sharing of knowledge – quality wheel; disclosure and distribution of knowledge takes place with the use of most well-known instruments supporting their progress),
- ensuring complex social and technical infrastructure of the knowledge environment (particular focus on development of social factors is suggested),
- consideration of the inter-organisational dimension of knowledge diffusion,
- shaping of appropriate organisational culture, namely one that evolves towards knowledge culture taking account of standards of behaviours and principles of knowledge transfer preferred by employees (including a change in attitude from obligatory avoidance of uncertainty that limits creativity to actions focused on tolerating errors that trigger propensity to risk and change in the philosophy of thinking that knowledge=power, restricting the openness in sharing knowledge.

To sum up, when indicating improvement directions of the knowledge transfer process in the examined companies, we should first create a comprehensive knowledge transfer system as a subsystem of the knowledge management system, taking into account both the social and technological dimension of this process (Figure 1). It may constitute a model solution for most organisations, taking account of the main values, detailed principles, as well as specific conditions of social and technical knowledge environment infrastructure pertaining to knowledge transfer.

The analysed results should be treated only demonstratively, since they have clear restrictions due to the size of the research sample. The research should be perceived only as pilot deliberations that confirm knowledge transfer in enterprises and can authorise to conduct proper, multi-dimensional scientific explorations concerning, for instance, the impact of knowledge-oriented culture on the effectiveness of knowledge diffusion, with splitting into its particular sub-processes, as well as the role, functions and tasks of the knowledge diffusion process coordinator as a knowledge broker or the direction of specific knowledge transfer sub-processes, with identification of which sub-processes are based on internal knowledge, and which ones are originating from outside the organisation.

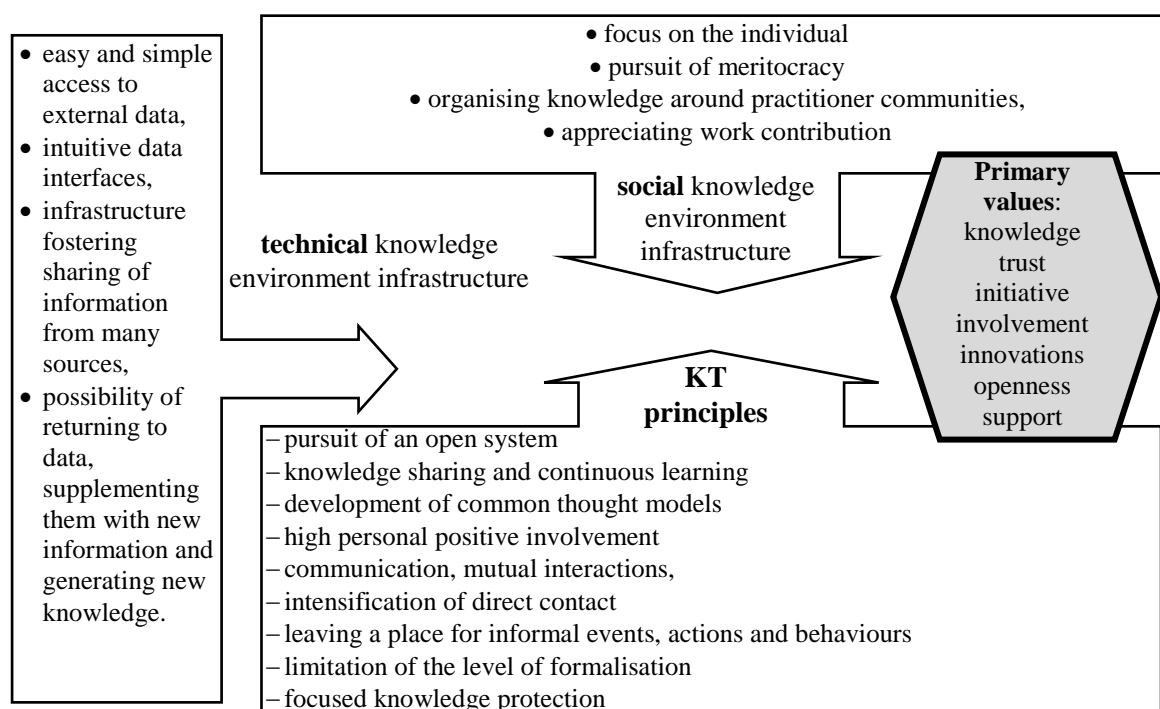


Figure 1: Elements of the knowledge transfer system in organisations

Source: Author

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DOMESTIC AND CROSS-BORDER ACQUISITIONS PERFORMANCE: EVIDENCE FROM SERBIA

Sladana Savović¹, Verica Babić²

Abstract: Numerous studies over the last twenty years have focused on the key issues of whether acquisitions are successful. These studies have mainly focused on domestic acquisitions. Despite the growing importance of cross border acquisitions, effects of these transactions mainly stay under-explored compared to domestic acquisitions. Additionally, studies have mainly considered transactions in developed economies, while research in transitional economies is relatively limited. The present study therefore attempts to fill this research gap by exploring the effects of domestic and cross-border acquisitions on performance of acquired companies in the Serbia, as transitional economy. Data were collected from 44 managers in five acquired companies in the Serbia. Acquiring companies came from Norway, Switzerland, Italia and Serbia. Mann-Whitney U test was used to test the research hypothesis. The results indicate that the cross-border acquisitions achieved the better acquisition performance compared with domestic acquisitions. Cross-border acquisitions had the best improvement in non-financial performance such as market share, job satisfaction, product quality, expansion of customer base and development of new products and services.

The study makes an important theoretical and practical contribution. First, the results of this study theoretically and empirically expand the knowledge base about effects of domestic and cross-border acquisitions in Serbia as a transitional economy. Second, this study provides depth analysis of acquisition performance analyzing and comparing indicators of performance of domestic and cross-border acquisitions. Third, this study explains the conditions under which cross-border acquisitions can improve post-acquisitions performance. Fourth, this study shows that there is a need to use hybrid models for the measurement of acquisition performance that will integrate financial and non-financial performance. Additionally, the results of this study have important practical implications for managers of acquired companies in transitional economies, as they represent a valid and pragmatic basis for decision making on the selection of future acquisition partner. Results of study might be used by policy makers for decision making on encouraging or discouraging of cross-border acquisitions in compare with domestic acquisitions.

Keywords: domestic acquisitions, cross-border acquisitions, acquisition performance

JEL Classification: G34, L25

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INTRODUCTION

Acquisitions have been a popular strategy for companies during the last few decades. Companies may undertake acquisitions in order to achieve growth, increase market power, access additional resources and skills. Numerous studies over the last twenty years have focused on the key issues of whether acquisition performance shows improvements (Schoenberg, 2006; Tuch & O'Sullivan 2007). These studies have mainly focused on domestic acquisitions. However, the acquisitions have great importance not only on a local or national level, but also at the international level. The globalization, deregulation, privatization and corporate restructuring processes have triggered a wave of cross-border acquisitions. Despite the growing importance of cross border acquisitions, effects of these transactions mainly stay under-explored compared to domestic acquisitions. A review of literature on the impact of type of acquisitions on acquisition performance provides contradictory findings. While some authors argue that cross-border acquisition achieved better performance than domestic acquisitions (Harris & Ravenscraft, 1991; Gregory & O'Donohoe, 2014; Danbolt, 2004), others have an opposite conclusion (Moeller & Schlingemann, 2005, Goergen & Renneboog, 2003, Mateev & Andonov, 2016).

Additionally, in recent time the scale of cross-border acquisitions has significantly increased in developing and transitional economies. In 2014, the value of cross-border acquisitions in developed economies increased by 16% and those in developing and transitional economies by 66%, compared with 2013 (World Investment Report, 2015). However, the literature on acquisitions is dominated by studies carried out in developed economies. Research related to transition economies, including and Republic of Serbia, is still very limited. Therefore, purpose of this paper is to investigate whether cross-border acquisitions achieved better performance compared with domestic acquisitions in the Serbia, as transitional economy.

This paper is structured as follows. First the theoretical considerations and hypothesis is presented. Next, research methodology is described in terms of sample, measure and the applied statistical methods. The subsequent section presents the discussion of the results. The final section emphasized the main conclusions and theoretical and practical contributions of the research results.

LITERATURE REVIEW

The effects of acquisition on acquisition performance

In interdisciplinary areas, such as M&A, different performance measures can be applied. The three most widely used measures of acquisition performance are cumulative abnormal returns, accounting-based measures, and managers' assessments. Finance researchers have relied on the evolution of stock prices and calculate cumulative abnormal returns. These measures are not accessible for the companies not listed on the stock exchange. The application of accounting-based measures requires making comparisons of financial data prior to and after acquisitions. The main shortcomings of accounting-based measures are that they reflect only past performance, and that application of different accounting policies by individual companies, making it difficult to compare the results. Additional problem of comparability of results arises from the fact that studies applied different accounting performance measures. Finally, the third group of researches relied on managers' assessments of performance. In the survey, the managers are asked to assess the financial and non-financial indicators on the basis of their personal understanding of the current situation in their companies. The advantages of using managers' subjective assessments of performance are that they allow multidimensional measurement facilitating a more holistic view of acquisition outcome.

Studies that examine the effects of acquisitions by observing changes in stock prices can be classified into short- and long-term studies. Short-term studies usually required 21-days event

period around the bid announcement (day -10 to +10) (Schoenberg, 2006). In these studies, researchers have found that the returns of acquired company shareholders are positive and significantly high because of the large premiums paid. Kottler, Goedhart, & Wessels (2005) emphasize that the shareholders of acquired companies obtain large premiums, on average 30% compared with the share price before the announcement of the offer. In contrast, results of studies regarding the impact on acquiring companies' shareholders are inconclusive, with some studies showing positive returns (Ben-Amar & Andre, 2006), and others showing negative returns (Sudarsanam & Mahate, 2003). Conversely, long-term studies (Tuch & O'Sullivan, 2007) have shown that, in the long run, acquisitions generate negative or insignificant returns for shareholders of the acquiring companies. Based on sample of Canadian M&As, Ben-Amar and Andre (2006) proved that shareholders of the acquiring companies earned the positive returns during the period from 1998 to 2000. Sudarsanam and Mahate (2003) examined the sample of 519 UK acquirers during the period from 1983 to 1995 and stated that there were negative abnormal returns in relation to the month of the merger bid, with only a third of the acquirers that realized the gains.

The results of accounting-based research provide no clear evidence of improved acquisition performance. Analyzing transactions in the USA, Healy, Palepu, & Ruback (1992) point out that the acquisition performance of companies were higher, compared to performance in pre-acquisitions period. In contrast, Sharma and Ho (2002) studied Australian transactions and found that acquisitions do not lead to significant improvements in acquisition performance.

The third stream of research use managers' assessment of acquisition performance. A study by the American management consulting firm Booz Allen Hamilton Inc. found that 53% of mergers and acquisitions failed to deliver the expected results (Adolph et al., 2001). A study conducted by KPMG showed that 82% of the transactions were successful according to the opinion of the executive managers (Kelly et al., 1999). Schoenberg (2006), in a study of 61 international acquisitions executed by UK companies from 1988 to 1990, found that in 56% of cases managers were neutral to highly satisfied with the financial performance of acquisitions compared with expectations.

Comparison between performance of cross-border and domestic acquisitions

A review of the literature on performance effects of domestic and cross-border acquisitions provides contradictory findings. Whereas most studies show that cross-border acquisition performed better than domestic acquisitions (Harris & Ravenscraft, 1991; Gregory & O'Donohoe, 2014; Danbolt, 2004), some studies have an opposite conclusion (Moeller & Schlingemann, 2005, Goergen & Renneboog, 2003, Mateev & Andonov, 2016). Harris and Ravenscraft (1991) compare cross-border and domestic acquisitions in the US and conclude that US target companies perform better after cross-border than after domestic acquisitions. In a study of 514 domestic and 116 cross-border acquisitions in UK for the period 1986-1991, Danbolt (2004) examined acquired company effects in acquisitions. Danbolt (2004) found that the returns to the acquired company's shareholders were higher for cross-border acquisition compared to domestic acquisitions. During the four month of the bid announcement (from t-2 to t+1) shareholders gained cumulative abnormal returns of 30.71% in cross-border acquisitions compared to 20.64% in domestic acquisitions. Gregory and O'Donohoe, S. (2014) examined the short term wealth effects both acquiring and acquired companies on sample of 290 acquisitions for the period 1990 to 2005. Results of their study show that acquiring companies had negative returns and that domestic companies fare worse than international companies. On the other hand, acquired companies had positive returns, but there aren't significant differences between domestic and cross-border acquisitions. The study by Moeller and Schlingemann (2005), which included 4.340 acquisitions between 1985 and 1995 found that U.S. acquirers experience significantly larger performance for domestic than for cross-border transactions. On the sample

of 118 acquisitions in 18 European countries, Goergen and Renneboog (2003) conclude that domestic acquisitions create larger short-term wealth effects than cross-border acquisitions. On basis 2812 European domestic and cross-border acquisitions, Mateev and Andonov (2016) investigate the short-term wealth effects acquiring companies and conclude that, domestic acquisitions performed better than cross-border acquisitions.

In contrast to the above-mentioned studies, Bertrand and Betschinger (2012) on sample Russian acquired companies found that domestic and cross-border acquisitions negatively affected performance. Additionally, the results of their study show that there aren't differences between performance of cross-border and domestic acquisitions. It was interesting study conducted by Narayan and Thenmozhi (2014). These authors investigated whether cross-border acquisitions involving emerging markets create value. Authors found value destruction when emerging market companies acquire companies in developed markets, but when developed market companies acquire companies from emerging markets, there is a chance of value creation.

Although evidence from empirical research on the influence of type of acquisitions on acquisition performance is mixed, we appreciate specific context in formulation hypothesis. We examined effects of domestic and cross-border acquisitions in the context of a transitional economy. In Serbia cross-border acquisitions were dominant compared to domestic acquisitions. According knowledge-based view, knowledge is the key source of competitive advantage. Since foreign investors have patent-protected technology as well as, superior managerial and marketing skills, they can improve competitive position and performance of acquired companies. Therefore, we expect that better effect of cross-border acquisition on performance of acquired companies in compare with domestic acquisitions. Thus the research hypothesis is:

Hypothesis: Cross-border acquisitions achieved better acquisition performance compared with domestic acquisitions.

METHODOLOGY

Sample and procedure

This study analyzes domestic and cross-border acquisitions in Serbia during the period from 2002 to 2011. The survey was carried as a part of a larger research effort. The data sources for the acquired companies were The Privatization Agency of the Republic of Serbia and The Securities Commission of the Republic of Serbia. As respondents, managers from acquired companies (top management, middle management and operative management) were chosen. First, cover letters were sent to the CEOs of the acquired companies to inform about the research project. Next, CEOs were contacted by phone asking them to approve distribution of the questionnaire. The acquired companies are from different industrial branches: distillation, purification and mixing of drinks (2), production of metal processing machinery (1), cement production (1), motor vehicle and engine part production (1). Regarding the type of acquisition, three are cross-border acquisitions, and two cases are domestic acquisitions. Acquiring companies are from Norway (1), Switzerland (1), Italia (1) and Serbia (2). The sample covers 44 respondents. Regarding positions the largest portions of the respondents (72,7%) are operative management, while 25.0% are middle management and 2.3% is top management. The respondents were 61% male, and 59% with over 25 years of work experience.

Variable measurement

In this study, acquisition performance was measured by managers' subjective assessments. Although many studies have measured of acquisition performance using a single respondent strategy relying on assessment by a single manager from each company, in this study the multiple respondents used from each acquired companies. Actually, the using of multiple

respondents in assessment of acquisition performance, we have tried to provide richer and more coherent results.

The respondents were current managers (top, middle and operative) of acquired companies, who had also been serving as managers at the time of the acquisitions. Since after acquisitions, many managers left acquired companies, fulfilment of this criterion reduced the number of respondents within the companies. A five-point Likert scale (1-strongly disagree, 5-strongly agree) allowed managers to assess the acquisition performance.

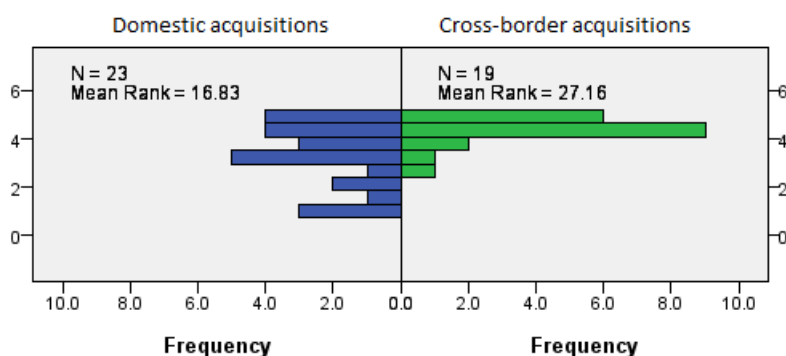
Statistical analysis

Statistical data analysis was performed by using the Statistical Package for Social Science – SPSS v. 20.0. Reliability and internal consistency of a scale were measured through coefficient values of Cronbach's alpha ($\alpha = 0.964$). Given that value is above 0.7, we can infer that variables which are used to measure acquisition performance have a high level of internal consistency. A Shapiro-Wilk test was used to test the normality of the distribution of variables. This test is used in the samples which counter less than 50 respondents. Normality of distribution is confirmed if deviation from normality is statistically insignificant ($p > 0.05$). In this case, the levels of significance of Shapiro-Wilk test ($p = 0.00$) indicate that assumption of normality of distribution was not confirmed. The hypothesis was tested with the Mann-Whitney U test.

RESULTS AND DISCUSSION

We conducted a formal statistical test of Hypothesis to check the significance of differences between the acquisition performance of domestic and cross-border acquisitions. An examination of the findings in Table 1 shows that the results of Mann Whitney U test, applied to compare the acquisition performance of domestic and cross-border acquisitions, revealed a statistically significant difference ($Z = -2.721$, $p = 0.007 < 0.05$). Graph 1 also shows the results of Mann Whitney U test. The mean rank of the acquisition performance of cross-border acquisitions was 27.16, while the domestic acquisition had score mean rank of 16.83. We calculated an effect size for the Mann-Whitney U-test ($r = 0.419$). Based on Cohen's guidelines for r (a large effect is 0.5, a medium effect is 0.3, and a small effect is 0.1) (Coolican, 2009) we can conclude that there is a medium effect size. The results indicate that the cross-border acquisitions achieved better acquisition performance compared with domestic acquisitions. Therefore, Hypothesis is supported by the results.

Graph 1. Results of the Mann Whitney U Test to compare the acquisition performance of domestic and cross-border acquisitions
Independent-Samples Mann-Whitney U Test



Source: Authors' calculation

Table 1. Results of the Mann Whitney U Test to compare the acquisition performance of domestic and cross-border acquisitions

	Type of acquisitions	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Z	p
Post-acquisition performance	Domestic acquisitions	23	16.83	387.00	111.000	-2.721	0.007
	Cross-border acquisitions	19	27.16	516.00			

Source: Autors' calculation

Table 2. Results of the Mann Whitney U Test to compare the indicators of acquisition performance of domestic and cross-border acquisitions

	Type of acquisitions	N	Mean Rank	Sum of Ranks	p
Income growth/stability	Cross-border	20	25.73	514.50	0.054
	Domestic	23	18.76	413.50	
Cost reduction	Cross-border	20	21.50	430.00	0.795
	Domestic	23	22.43	516.00	
Improvement of productivity	Cross-border	20	24.53	490.50	0.450
	Domestic	23	21.78	544.50	
Improvement of the market share	Cross-border	20	27.20	544.00	0.046
	Domestic	23	19.64	419.00	
Improvement of the competitive position	Cross-border	20	27.30	546.00	0.006
	Domestic	23	17.39	400.00	
Improvement of job satisfaction	Cross-border	20	28.73	574.50	0.001
	Domestic	23	17.39	371.50	
Expansion of the customer base	Cross-border	20	30.70	614.00	0.000
	Domestic	23	14.43	332.00	
Improvement of the quality of the products/services	Cross-border	20	27.25	545.00	0.008
	Domestic	23	17.43	401.00	
Development of the new products/services	Cross-border	20	28.60	572.00	0.001
	Domestic	23	16.26	374.00	

Source: Autors' calculation

We also carried more deeply the analysis by testing the significance of differences between the indicator of acquisition performance domestic and cross-border acquisitions. The Table 2 shows the results of the Mann Whitney U Test to compare the indicators of acquisition performance of domestic and cross-border acquisitions. The analysis shows statistically significant differences between domestic and cross-border acquisitions in terms of non-financial indicator of performance such as market share, job satisfaction, product quality, expansion of customer base and development of new products and services.

CONCLUSIONS AND IMPLICATIONS

The results of analysis show significant differences between acquisition performance of acquired companies involved in cross-border and domestic acquisitions. Acquired companies involved in cross-border acquisitions have a better acquisition performance than acquired companies involved in domestic acquisitions.

Possible reasons for achieving the positive effects of cross-border acquisitions can include the benefits that foreign investors realize in transitional economies. Low labour costs, subsidies for new employment, as well as tax incentives are some of the ways in which foreign investors achieve savings used to invest in the growth and development of acquired companies. Additional explanations for the positive effects of cross-border acquisitions on performance can be increased efficiency of management and transfer of managerial expertise. In cross-border acquisitions, companies are more likely to have different knowledge bases, thus creating potential for knowledge transfer and synergy. Foreign investors often change the chief executive officer and chief financial officer, by creating a heterogeneous top management team consisting of managers with experience in market economies and managers who know the local market (Filatotchev et al., 2003). In this way, the management process in the acquired companies is usually improved, because the teams use their complementary knowledge in the process of adapting to the market conditions of the business. In addition, after acquisitions, foreign investors provide new technology and capital, reorganize the business operations and establish new system of values in companies, which has an impact on improving the performance of acquisitions.

More specifically, the results of this study show that there are statistically significant differences in non-financial performance, in particular, market share, improvement competitive positions, job satisfaction, product quality, expansion of customer base and development of new products and services. The importance of these non-financial indicators of performance is reflected in the fact that they provide a basis for improving company performance in the long term. Financial performance, such as net profitability, return on asset, return on equity, will not be achieved if the specific non-financial indicator not achieved (for example, motivation employee, product quality, investment in research and development and other innovative activities, etc.). Therefore, it is important that companies focus control and improve of non-financial results, creating the basis for improvement company performance.

Our research results offer several meaningful theoretical contributions. First, because researches of mergers and acquisition generally, and acquisition performance in Serbia especially are limited, the results of the present study theoretically and empirically expand on the M&A literature in the context of a transition economy. Second, by comparing indicators of acquisition performance of domestic and cross-border acquisitions, this study provides depth analysis of acquisition performance. Third, this study explains the conditions under which cross-border acquisitions can improve post-acquisitions performance. In Serbia cross-border acquisitions are dominantly present compared with domestic acquisitions, with the majority of investments arriving from European Union countries. Our findings indicate that type of acquisitions is a factor of acquisition performance and that cross-border acquisitions in Serbia performed better than domestic acquisition. Foreign acquiring companies are an important source of knowledge for the acquired companies, because they have significant intangible assets and capabilities such as superior marketing expertise, patent-protected technology, and managerial know-how which can help achieve better development of the acquired companies. Fourth, this study shows that there is a need to use hybrid models for the measurement of acquisition performance that will integrate financial and non-financial performance indicators, therefore providing a holistic, integral view of acquisition success. It is important to measure acquisition performance by using multiple indicators so as to better evaluate the performance of acquisitions. Starting from the fact that a complete set of relationships with the stakeholders has a strategic impact on long-term success and survival of companies, corporate performance measurement should not be limited exclusively on creating value for one stakeholder, i.e. shareholders. Taking into consideration the needs of other stakeholders (employees, clients, suppliers, financial partners, government, local community and society generally) in the process of corporate performance evaluation, results into adopting the holistic and comprehensive framework. The word is about remarkably

flexible framework that expands and upgrades the traditional financial/economic approaches to the performance measurement in accordance with the needs and requests of all stakeholders.

The results of our study have important practical implications. The research results can provide important information to managers of companies whether the strategy of domestic or international acquisitions is successful, which may represent a valid and pragmatic basis for decisions on the selection of future acquisition partners. Findings from this study might have implications for policy makers in terms of decision-making on whether cross-border acquisitions should be encouraged or discouraged in comparison with domestic acquisitions.

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ORGANIC DESIGN AS A FACTOR OF KNOWLEDGE MANAGEMENT IN HIGHER EDUCATION

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Abstract: *Under the influence of globalization, accelerated development of information and communication technologies, as well as numerous changes in the world economy, natural resources no longer constitute key drivers of economic growth and development, but the knowledge, as a specific resource that is difficult to imitate or replace, takes over the dominant role. The knowledge economy - a concept that emphasizes the importance of knowledge management as a basic generator of sustainable economic growth, has emerged. In this kind of economy, higher education institutions play a central role, as the biggest "producers" of knowledge. Educational systems around the world are facing reform, and one of the main implications of higher education reform is the implementation of the knowledge management process and appropriate subprocesses, which may be considered as three interdependent phases, such as knowledge creation, knowledge sharing and the use of knowledge. Although creating knowledge for end-users - pupils and students, is the primary goal of the education system in each country, it is very important to develop a systematic approach to knowledge management in the internal environment of faculties and universities, in order to maximize value for key stakeholders. It is very important that employees are always creating new tacit knowledge, translating it into explicit knowledge, sharing knowledge among themselves, as well as with external actors - through networking processes, and using knowledge in a purposeful manner, which makes it easier to adapt to the market and improve performance.*

Therefore, it is important to examine different, personal, organizational, technological, cultural and other factors that can encourage or limit each of the above-mentioned knowledge management phases in higher education institutions. The research of organizational parameters, which greatly influence the process of knowledge management in various industries, is particularly significant. Nevertheless, there is still lack of research that touches upon the observed problem area and confirms the above assumptions. There is also a notable lack of empirical evidence in the field of higher education in the countries of Southeastern Europe. Therefore, the paper analyzes the interdependence of organizational design, on the one hand, and the process of creating and sharing knowledge, on the other hand, at higher education institutions. The basic aim of the paper is to determine whether and to what extent the characteristics of organic design contribute to the creation and sharing of knowledge in universities. The derived goal is to determine the differences in the processes of creating and sharing knowledge between employees in academic and non-academic functions, given the differences in the nature of work. In order to achieve the set goal, the existing theoretical and empirical knowledge was analyzed and a survey was conducted on a sample of several faculties of the University of Kragujevac.

Keywords: *Knowledge Management, Organization Design, Higher Education*

JEL Classification: *M21, D83, I23, D23*

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INTRODUCTION

Changes in the environment related to the reduction of the state budget for university funding, resource constraints and increased competition (Schmidt, 2014) lead to changes in the level of university governance and management. The concept of New Public Management has put into question the traditional ways of governance, such as *the state-centered model* or *the academic self-rule model* (Braun, 1999; Krücken, 2014; Davidovich & Iram, 2015). There is a gradual movement towards a *market-oriented model* of governance with a focus on the economic benefits of teaching and research (Meek 2000; Dobbins et al., 2011), as well as expanding the field of development through linking with other universities and organizations, but primarily with the economy, all with the aim maximizing economic and market performance.

One of the basic implications of higher education reform is the implementation of the knowledge management process and appropriate subprocesses, which can in principle be considered as three interdependent phases, namely: knowledge creation, knowledge sharing and the use of knowledge (Armistead, 1999; Liao, Chuang & 2011; Zheng, Yang, & McLean, 2010). In order to develop each of the phases mentioned above, it is necessary to examine and adjust various organizational parameters, which encourage or limit them. Recent research shows that the characteristics of the organizational structure largely determine the success of the knowledge management process in various industries (Cavaliere, Lombardi & Giustiniano, 2015; Tholath & Thattil, 2016). According to these studies, some of the basic organizational prerequisites for successful creation and sharing of knowledge are: flexibility and abandonment of rigid procedures, high levels of autonomy in carrying out work tasks and team work. In addition, various authors have identified a specific set of attitudes, values and beliefs rooted in organizations that form an organizational culture that supports knowledge (knowledge culture) (Islam, Jasimuddin, & Hasan, 2015; Suppiah & Sandhu, 2011).

However, there are still few studies that touch upon the observed problem area and confirm the above assumptions, and there is a notable lack of empirical studies in the field of higher education in the countries of South-East Europe. Thus, the paper analyzes the interdependence of organizational design, on the one hand, and the processes of knowledge creation and knowledge sharing, as knowledge management phases, on the other hand, at higher education institutions.

The aim of the paper is to determine whether and to what extent the structural parameters of organic design contribute to the knowledge creation and knowledge sharing in an organization. The existing theoretical and empirical knowledge was analyzed and a survey was conducted on the example of several faculties of the University of Kragujevac.

LITERATURE REVIEW

In modern economics, physical work and natural resources no longer constitute key drivers of economic growth, but the dominant role is taken by information, ideas, innovations, research and development, or different forms of knowledge. Material resources no longer represent dominant inputs in the process of creating value, but it is knowledge as a specific resource, which is difficult to imitate or replace. There are two categories of human knowledge: *explicit knowledge*, which can be transferred to a formal, systematic language, easily transmitted and documented, and *tacit knowledge*, which is personalized, difficult to formalize, verbally describe and communicate. Tacit knowledge is deeply rooted in actions and is inseparable from the specific context in which it is an integral part (Nonaka, 1994, p. 16). However, it should be noted that knowledge can not be completely explicit or implicit, but always consist of explicit and implicit components (Polanyi, 1983 according to Guzman & Trivelato, 2011).

In the knowledge economy, universities, and in particular research universities, play a central role in the processes of knowledge creation and innovation, and therefore in the initiation of

economic growth and development. Some programs are more focused on the transmission of explicit knowledge, while others are aimed at building a tacit knowledge component for students and employees. The knowledge economy can be viewed as a set of interdependent relationships between information and communication technologies, innovation, commercialization of research and national prosperity. It is believed that commercialization of research can create a range of social benefits, such as economic progress, international competitiveness, social well-being, and sustainable economic growth, although there are still disagreements in economic literature regarding these relationships (Bastalich, 2010). However, many researchers agree that the ability to create, distribute and exploit knowledge becomes important drivers of economic performance and the main sources of competitive advantage, wealth creation and quality of life (OECD 2000; Sharabati-Shahin & Thiruchelvam, 2013), and that universities, as carriers of rare and valuable human capital, play a significant role in improving the competitiveness of national economies. Universities are knowledge hubs, which strengthen the link between research, on the one hand, and the application and commercialization of knowledge, on the other hand (Youtie & Shapira, 2008). In addition, modern universities must encourage lifelong learning (LLL), both for own employees, students and other clients. The basic idea is that there should be an education system that will at any moment provide every individual, regardless of age or professional status, with the ability to master new, diverse and useful knowledge (Babić, Makojević, & Erić, 2010).

Knowledge management in an organization includes a series of processes that can be defined as knowledge creation, knowledge transfer or sharing, and the use of knowledge (Armistead, 1999; Liao et al., 2011; Zheng et al., 2010). In fact, the first two phases could be viewed as prerequisites, which allow, but do not guarantee, the use of knowledge. In this paper, the focus is on the processes of knowledge creation and sharing, from the perspective of organizational factors which facilitate and encourage these processes.

The process of *knowledge creation* can be defined as a system of initiatives and activities aimed at generating new ideas or objects (Mitchell & Boyle, 2010). This process is embedded in human relations and interactions, that is, it takes place within a specific social context, in which it has a specific meaning. Although the knowledge creation used to be seen as an intraorganizational process, there is more and more emphasis on the importance of creating knowledge through links with other organizations or individuals, environmental experts (Wenger & Snyder, 2000). *Knowledge sharing* relates to the degree to which knowledge in an organization is shared between individuals and between departments (Liao et al., 2011; Zheng et al., 2010). The ability to share knowledge does not only facilitate cross-functional interactions, but also enables better collaboration between employees, as well as understanding the entire business process, rather than focusing on its fragments (Mahmoudsalehi, Moradkhannejad, & Safari, 2012, p. 520). Knowledge sharing can be informal, voluntary and realized through direct communication between employees, can be supported by information systems for sharing information, such as intranets or electronic boards (Lee, Lee, & Kang, 2005; Vuori & Okkonen, 2012), or it is possible to develop a system for rewarding knowledge sharing in order to encourage this process (Gold, Malhotra, & Segars, 2001).

There are various factors, which can encourage or limit the flow of knowledge in an organization of any kind, and therefore at universities and faculties, as educational institutions. Among other factors, such as individual traits or cultural features, there are factors related to *organizational design*. Empirical studies show that the flexibility and absence of rigid procedures are the organizational design characteristics that favor the knowledge management processes (Cavaliere et al., 2015, Islam et al., 2015; Mahmoudsalehi et al., 2012). In addition, a high level of autonomy in doing workflows allows employees the freedom to create new knowledge (Tholath & Thattil, 2016), while bonding based on team work is the basis for knowledge creation through interaction, as well as knowledge sharing (Lloria & Peris-Ortiz, 2014; Roth, 2003). In fact,

modern organizational forms, which stimulate knowledge flows, have more characteristics of an organic rather than a mechanical organizational design. For the purpose of effective knowledge management, Nonaka (1994) proposes the creation of an organizational structure, which he called *hypertext* organization. This term is borrowed from the concept of computer software in which hypertext allows users to search large amounts of text, data and graphics using a friendly interface.

This is a three-layered organization that combines the efficiency of traditional hierarchical structure with the flexibility of a cross-functional, flat organization. The bottom layer represents a knowledge base system, in which tacit knowledge (e.g. organizational culture, specific abilities) and explicit knowledge (e.g. databases, documentation) are incorporated. The next layer is the business-system layer, where routine operations are performed. This system has all the characteristics of a functional, hierarchical and bureaucratic structure. The upper layer is the project-system layer, which is based on cross-functional linking of employees and formation of project teams. Team performance is crucial for the knowledge creation process. In doing so, it is very important that employees working in teams share a common corporate vision and are motivated by top management in an adequate way. Organizational knowledge is created through continuous, dynamic circulation of information through all three organizational layers (Nonaka, 1994).

For modern institutions of higher education, it is significant to adjust the organizational structure, as well as the supporting processes and activities that contribute to effective knowledge management. In addition, it is very important to open the boundaries and to actively network with partners, both in the field of education and other activities, in order to improve the interdisciplinarity of the teaching, scientific and research processes. In this way, there is a higher inflow of new knowledge, as well as the broadening of employee specialization. We argue that wide horizontal specialization is one of the prerequisites for knowledge sharing between employees. If each employee is narrowly specialized, knowledge sharing will not be effective or practical. Starting from the previously discussed theoretical foundation, the following hypotheses have been developed:

H1: *Organic design is in positive correlation with knowledge creation in higher education.*

H2: *Organic design is in positive correlation with knowledge sharing in higher education.*

METHODOLOGY

According to the subject and goals of the paper, empirical research was conducted on a sample of three faculties of the University of Kragujevac. A quantitative methodology has been applied.

Methods for data collection and analysis

In order to test the hypotheses, data on independent and dependent variables were collected using a questionnaire, which consists of 23 items. The first part of the questionnaire includes 10 items on the organizational structure, which are based on theoretical knowledge of the structure parameters corresponding to organic design (Burns & Stalker, 1961). The second part of the questionnaire is composed of 4 questions related to knowledge creation, and the third part contains 5 questions on knowledge sharing. Items in the second and third part of the questionnaires are mostly based on the scale introduced by Lee et al. (2005). All questions in the first three parts of the questionnaire are of scalar type, i.e. respondents answered questions, based on the degree of compliance with the testimony, using a five-step Likert scale. The last part of the questionnaire, collected general information about respondents, such as gender, age, position in the company and level of education, based on the closed type issue. The final structure of the questionnaire is the result of the original scientific approach of the authors, in accordance with the defined subject and objectives of the research. The survey was conducted in person, at the

faculties itself, and the respondents were informed about the anonymity of the survey, as well as the significance of their answers for scientific research.

Data processing was performed using SPSS 20.0. Firstly, the structure and characteristics of the sample were analyzed, using descriptive statistical indicators. Reliability of the scale was analyzed using Cronbach's alpha coefficient. For the hypotheses testing, a correlation was applied. The difference in attitudes between teaching and extracurricular staff was assessed using Mann Whitney U test to compare statistically significant differences between two independent samples.

Scale reliability

The reliability of the scale was analyzed using the Cronbach Alpha coefficient (Table 1). The scale consists of 3 sub-scales, namely: Organic Structure, Knowledge Creation and Knowledge Sharing. Scales 1 and 3 have a medium level of reliability, while second scale has a high level of reliability, taking into account the number of items from which they comprise ($\alpha_1 = 0.561$ (10 items), $\alpha_2 = 0.821$ (4 items), $\alpha_3 = 0.662$ (5 items)).

Table 1. Scale reliability

Scale	Number of items	Cronbach'a alpha coefficient
1.Organic Structure	10	0.561
2.Knowledge Creation	4	0.821
3.Knowledge Sharing	5	0.662

Source: Authors' calculation

RESULTS AND DISCUSSION

The sample

The sample consists of 60 respondents, employed at three faculties of the University of Kragujevac. Both faculties and respondents were randomly selected. The structure of the sample is shown in Table 2. Both genders are approximately represented, while the sample is dominated by respondents with masters or doctoral studies, in the age category of 26-45 years. When it comes to the position in the organization, the academic (teaching & research) staff makes 65% of the sample, while the administrative staff makes 35% of the sample.

Table 2. The structure of the sample

	Frequency	Percent
Gender		
Female	34	56.7%
Male	26	43.3%
Education		
High school	6	10.0%
College	2	3.3%
BSc	8	13.3%
Masters/Doctorate	44	73.3%
Age		
26-35	21	35.0%
36-45	19	40.0%
46-55	12	20.0%
55 and more	8	13.3%
Role		
Academic staff	39	65.0%
Administrative staff	21	35.0%
Total	60	100%

Source: Authors' calculation

Correlation analysis

In order to determine the correlation between organizational structure, knowledge creation and knowledge sharing, the Pearson coefficients of correlation (r) between the dimensions of independent and dependent variables are calculated (Table 3).

Table 3. Pearson coefficients of correlation between Organic Structure, Knowledge Creation and Knowledge Sharing

Variables	Mean	SD	1	2	3
Organic Structure	3.41	0.407	1		
Knowledge Creation	3.30	0.819	0.484**	1	
Knowledge Sharing	3.50	0.624	0.032	0.297*	1
** Correlation is significant at the level of 0.01					
* Correlation is significant at the level of 0.05					

Source: Own research

The degree of strength of linear correlation is interpreted in accordance with the guidelines given by Cohen (1988, pp. 79-81). Accordingly, it can be inferred that the correlation between *Organic Structure* and *Knowledge Creation* (0.484) is at the medium level ($0,30 < r < 0,49$), so that the hypothesis H1 is supported, which is in line with the previous research carried out in enterprises and other organizations (Cavaliere, 2015; Islam et al., 2015). On the other hand, there is no statistically significant correlation between *Organic Structure* and *Knowledge Sharing*, so H2 hypothesis is not supported. Such a result deviates from the knowledge obtained in previous research, so it is necessary to examine whether there are other factors that influence the correlation between organic organizational structure and knowledge sharing in higher education institutions.

The comparison between academic and non-academic staff

In order to gain additional knowledge about the organizational assumptions of creating and sharing knowledge in higher education institutions, the paper examined whether there are differences in the attitudes of respondents who belong to different functional areas in the organization, in terms of all three observed variables. More precisely, a comparison of the differences in the attitudes of the teaching staff was carried out (professors, assistants, associates) and other, administrative functions (general and personnel, finance and accounting, student service, etc.). To test statistically significant differences between two independent samples, non-parametric Mann Whitney U test was applied.

Table 4. Mann Whitney U test

	Organic structure	Knowledge creation	Knowledge sharing
Mann-Whitney U	316.500	325.000	352.000
Wilcoxon W	547.500	556.000	1132.000
Z	-1.450	-1.318	-0.897
Asymp. Sig. (2-tailed)	0.147	0.187	0.370

Source: Own research

By looking at the results shown in Table 4, it can be inferred that there are no statistically significant differences in the attitudes of respondents, employees who perform various activities, neither in terms of organizational design nor in terms of creating and sharing knowledge, which is good because it indicates that there is a unified system of knowledge management in the organization.

CONCLUSIONS AND RECOMMENDATIONS

Globalization, increased competition, knowledge economy and other challenges have many implications in the field of higher education, especially with regard to the management and governance of universities and faculties. The creation of entrepreneurial universities, supported by the market-oriented model of governance, is inextricably linked to effective knowledge management, since the quality of teaching and research depends on the process of creating, sharing, transferring and using knowledge as a critical resource, while the sustainability of higher-education institutions depends on the research commercialization. Therefore, it is very important to investigate factors that encourage or limit these processes.

The paper examines the interdependence between structural parameters of organizational design and the processes of knowledge creation and knowledge sharing. Starting from the previous studies, which indicated the positive influence of the organic design dimensions on the knowledge creation and knowledge sharing, the problem area is empirically explored in higher education, that is, on the example of the University of Kragujevac. The correlation between certain characteristics of organic design (low specialization, decentralization, flexible coordination mechanisms, team work, etc.) and the processes of knowledge creation and knowledge sharing was tested. The data were collected by the survey method, and the statistical analysis confirmed that there is a medium level of correlation between organic structure and knowledge creation. Therefore, a flexible, flat organization with low specialization is positively correlated with knowledge creation. Also, employee participation in decision-making, decentralization, intensive communication and lack of rigid rules and procedures support this phase of the knowledge management process. In addition, as has been found in earlier studies, flexibility in terms of team building and team work are significant organizational prerequisites for creating knowledge at faculties. When it comes to knowledge sharing, no statistically significant connection of this process with organic organizational design has been identified in the observed sample.

The key contribution of the paper is reflected in providing knowledge about the organizational prerequisites of knowledge creation, where the construct of organic structure encompasses various dimensions, as opposed to previous research, which mainly included some segregated elements, such as formalization and centralization (Islam et al, 2015; Mahmoudsalehi et al., 2012). Although empirical results are based on a small sample, knowledge can also be useful for other faculties in the country or abroad, which have a similar organizational design.

Research limitations, above all, arise from the lack of the survey as data collection technique, such as subjectivity of the respondents or their possible perception errors. Also, the research was conducted on a small sample, so in the future the results should be complemented and compared with other, similar or different, institutions of higher education in Serbia and abroad. In future research, apart from increasing the sample, it is also necessary to analyze the connection between other organizational requirements for creating and sharing knowledge, such as, for example, organizational culture, as well as openness for interaction with other organizations.

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THE INEVITABILITY OF UNIVERSITY ENTREPRENEURIAL PATH

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Abstract: *The transformation of a traditional research university to an entrepreneurial university is a current day phenomenon which can be risky. Nevertheless, the number of such transformations is increasing because of the reduction in university funding from government sources and the constant emergence of a competitive market for research and education. Fiscal and monetary stimulation and large corporations have been in the focus of public policies to ensure economic growth and job creation for a long period of time. But, the university is one of the world's most durable institutions and now, more than ever, it must pass a complex new test. Therefore, new approach has emerged focusing on promoting the spill over of knowledge through university entrepreneurship. This was a result of past the decade of Europe's worst economic performance in years. Integrating a universities' missions for economic and social development impel universities transformation towards entrepreneurial universities. To correctly design strategies to manage the transformation process requires a deep understanding of the strengths and weaknesses that the university presents toward the transformation. Creation of an entrepreneurial culture in a university environment and the movement towards a Triple Helix model of partnership between government, industry and higher education is a complex task that requires the efforts of many dedicated individuals. During any crisis it is important to support all contributors to an entrepreneurial economy. If universities do not become agents of innovation they will hamper regional and national development and international competitiveness. Universities as centres for knowledge creation and diffusion can be leveraged to generate future economic growth. University of Zenica is still primary a teaching university, as most of universities in Bosnia and Herzegovina, but in last couple of years a positive movement started towards entrepreneurial path of university, which is vital to achieve sustainable economic growth in this region. Considering basic characteristics of an entrepreneurial university it can easily be concluded that University of Zenica was a long way from an entrepreneurial university in the beginning, but, with growth the path has begun to change. For small transition countries, like Bosnia and Herzegovina, it is important that universities operate under policies that encourage entrepreneurship and innovation. The overall goal of this article is to highlight importance of entrepreneurial university and to analyse past and current characteristics of the University of Zenica. Identification of what is still necessary to be done on university entrepreneurial path toward becoming an entrepreneurial university and how to implement transformations as well as identification of possibilities and obstacles during this transformation will be presented and discussed in this paper.*

Keywords: *Entrepreneurial University, Entrepreneurship, Innovation, Triple Helix, University of Zenica.*

JEL Classification: *L26, I23, O10.*

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INTRODUCTION

The transformation of a traditional research university to an entrepreneurial university is a current day phenomenon. It can be risky. However, the number of such transformations is increasing because of the reduction in university funding from government sources and the emergence of a competitive market for education and research. Universities have been struggling with different issues over the past ten years, such as Bologna process, globalization and internationalization of higher education, rising number of student population, financial restrictions and recent financial and economic crisis. The main question for universities today is how to adapt to the dynamic and ever-changing environment.

The potential and real contributions of universities to economic development have long been discussed and much has been written over the past decade about the concept of the entrepreneurial university. Drawing from the US and European literature and experience (Clark 2004) it can be argued that Universities are entrepreneurial when they are unafraid to maximise the potential for commercialisation of their ideas and create value in society and do not see this as a significant threat to academic values. Behind this lies recognition of the need for a diversified funding base involving raising a high percentage of their income from non-public sources. A new approach has emerged focusing on promoting the spill-over of knowledge through *entrepreneurial university*. Integrating a universities' mission for economic and social development urges universities towards transformation of traditional teaching and research universities towards entrepreneurial universities. There is now a considerable international literature addressing the notion of what has been termed *the entrepreneurial university* (Gibb et al. 2009). The entrepreneurial university concept embraces universities of all types including those with a strong research tradition as well as newer organisations. The literature, both academic and pragmatic policy-oriented, ranges over a wide range of issues including (Gibb et al. 2009, 3):

- The basic philosophical idea of a university and how this is changing over time and the culture of the university;
- The commercialisation of university know-how;
- The process of technology transfer and exchange;
- The associated closer engagement of the university with industry and indeed stakeholders of all kinds;
- The movement towards a *Triple Helix* model of partnership between government, industry and higher education;
- The employability and skills development agenda of graduates and their preparation for a global labour market;
- The strategic response to the *massification* of demand for higher education;
- The internationalisation of universities and their strategies for dealing with global competition (both opportunities and threats);
- The changing nature of the knowledge society and the challenge this poses to the organisation of knowledge within higher education;
- The pressures on universities to respond to social as well as economic local and regional development problems albeit in a global context;
- The central pressure upon higher education, from central government, to foster innovation and demonstrate relevance to national and international competitiveness agendas;
- The autonomy and future funding of universities; and
- Overall, in response to the above, reflections on the *public value* of higher education institutions.

All the above pressures have served to shape change in organisation and governance structures of universities and they are leading to changes in mission statements and strategies. These changes have been the focus of much of the debate concerning the entrepreneurial paradigm.

The past decade is marked as the period of Europe's worst economic performance, and growth of interest in entrepreneurship. Such development has its ground in economic recession, growth of unemployment in most countries etc. Policy makers throughout Europe have become aware of the key role that entrepreneurship plays in achievement of economic growth, development and growth of employment rate. Higher education institutions, especially universities, play an important role in providing the necessary education for future entrepreneurs. The transformation of a traditional university to an entrepreneurial university will play an important role in advancing the global knowledge-based economy (Lazzeretti and Tavoletti 2005). The role of an entrepreneurial university in the dynamic environment of the knowledge economy is to support the economic development by increasing the amount and quality of research (applied and basic) and transferring such new knowledge to the community quickly through education and entrepreneurship. The traditional university is usually engaged in two main activities: research and teaching. Knowledge is transferred to the community through students who are later incorporated into the labour market, by publications in scientific journals which can take a considerable period of time. Entrepreneurial universities redefine the traditional roles of a university in the community as a knowledge creator through basic and applied research, technology and knowledge transfer agent, innovator, and supporter of economic development (Bercovitz and Feldman 2006). The new activities assumed by an entrepreneurial university aim to speed up the process of translating research into applications that can be quickly commercialized. This transformation is made possible by the creation of alliances with the industry that make available to the university fresh resources and intangible assets that public moneys cannot afford. At the same time the government may continue to play an important role in defining, coordinating and supporting research in critical areas which the society needs, and which may not be attractive to the industry, to accomplish a balanced development. Universities must turn into evolutionary entrepreneurial organization to fulfil their mission in an economy which must increase wealth and create employment by incorporating new knowledge in innovative products and technologies (Röpke 1998, 8).

An entrepreneurial university is characterised by several key factors (Robertson 2008):

- Strong leadership that develops entrepreneurial capacities for all students and staff across its campus;
- Strong ties with its external stakeholders that deliver added value;
- The delivery of entrepreneurial outcomes that make an impact to people and organizations;
- Innovative learning techniques that inspire entrepreneurial action;
- Open boundaries that encourage effective flows of knowledge between organizations;
- Multidisciplinary approaches to education that mimic real-world experience and focus on solving complex world challenges;
- The drive to promote the application of entrepreneurial thinking and leadership.

To be entrepreneurial, university must embed entrepreneurship in every part of itself, from its leadership through to its teaching and student impact. It needs to demonstrate excellence in strong leadership at all levels, innovative faculties and a clear, tangible impact on staff, stronger engagement with students in a diversity of learning opportunities, business and the local community, and it needs to demonstrate a long-term commitment of higher education institutions to engaging in enterprise and entrepreneurship, which will consequently help to develop an economy.

The main question – What kind of a university do we need today? – has a rather simple answer, a university which will meet the needs of a dynamic and turbulent working and life environment in a best way. Therefore, the main research question is to find out if University of Zenica was on entrepreneurial path and did situation changed after seven-year period. That is why research was conducted in 2010 and again in 2017 to track the changes and to see if the inevitability of entrepreneurial action was inevitable and present. Also, this enabled us to determine perception of entrepreneurial action of University from employee's point of view. To determine the perception of the University in Zenica and its current characteristics, a survey has been used. The aim was to determine changes and necessity, as well as basis for further framework for transformation towards an entrepreneurial university. The targeted population were employee's.

This research presents an exploratory research where the key aim is to investigate aspects in the era of entrepreneurial universities. The overall aim is to highlight importance of entrepreneurial university and to analyse past and current characteristics of the University of Zenica. The research also aims to identify what is still necessary to be done on university entrepreneurial path toward becoming an entrepreneurial university and how to implement transformations as well as identification of possibilities and obstacles during this transformation. To contribute to a better understanding and importance of the entrepreneurial university is also the aim of this research.

Creation of an entrepreneurial culture in a university environment and the movement towards a Triple Helix model of partnership between government, industry and higher education is a complex task that requires the efforts of many dedicated individuals. Therefore, new approach has emerged focusing on promoting the spill over of knowledge through university entrepreneurship. This was a result of past the decade of Europe's worst economic performance in years, and it was not researched enough especially in developing countries such as Bosnia and Herzegovina where Universities are traditional teaching-based universities. All of them need to understand what an entrepreneurial university is, and how important it is for the socio-economic development of a society and this research aims to fill that gap.

This paper is divided into three parts. First part is literature review and it analyses Triple Helix model and University as entrepreneurial organisation. One of the purposes of the literature review is identifying the gaps and providing the theoretical and conceptual framework from existing knowledge in the area. Second part is a Case of University of Zenica which includes research consisted of method and results. The last part are conclusions and recommendations which provide synthesis, conclusions and implications of the paper ultimate findings.

LITERATURE REVIEW

The changing dynamic environment of higher institutions and their respondent evolution is portrayed in Figure 1. The Figure attempts to characterise the evolving nature of the task environment facing universities on a simple/complex and certain/uncertain axis. It highlights the way that the notion of *Excellence* might be changing. Certainty in the environment has been reduced by changes in funding. There has been a movement away from a system that was at one time nearly total central or regional public funding, to a situation where a growing proportion of finance has to be sought from non-direct public sources including fees, research grants, local development monies, alumni, industry and social enterprise, contract research and philanthropy. While government remains a key player in most countries, it has moved its disbursement stance into a more directive mode. Thus, the uncertainty resulting from having to seek a greater proportion of funding from other sources is matched by pressure to move away from the simpler, more certain, *autonomous* environment (guaranteed by the public purse) within which to pursue individualistic research and teaching. There is now an imperative to demonstrate more direct public value. The public pressures for change are underpinned by several factors (Gibb et al.

2009) which are also contributing substantially to uncertainties and complexities (explained in hereinafter).

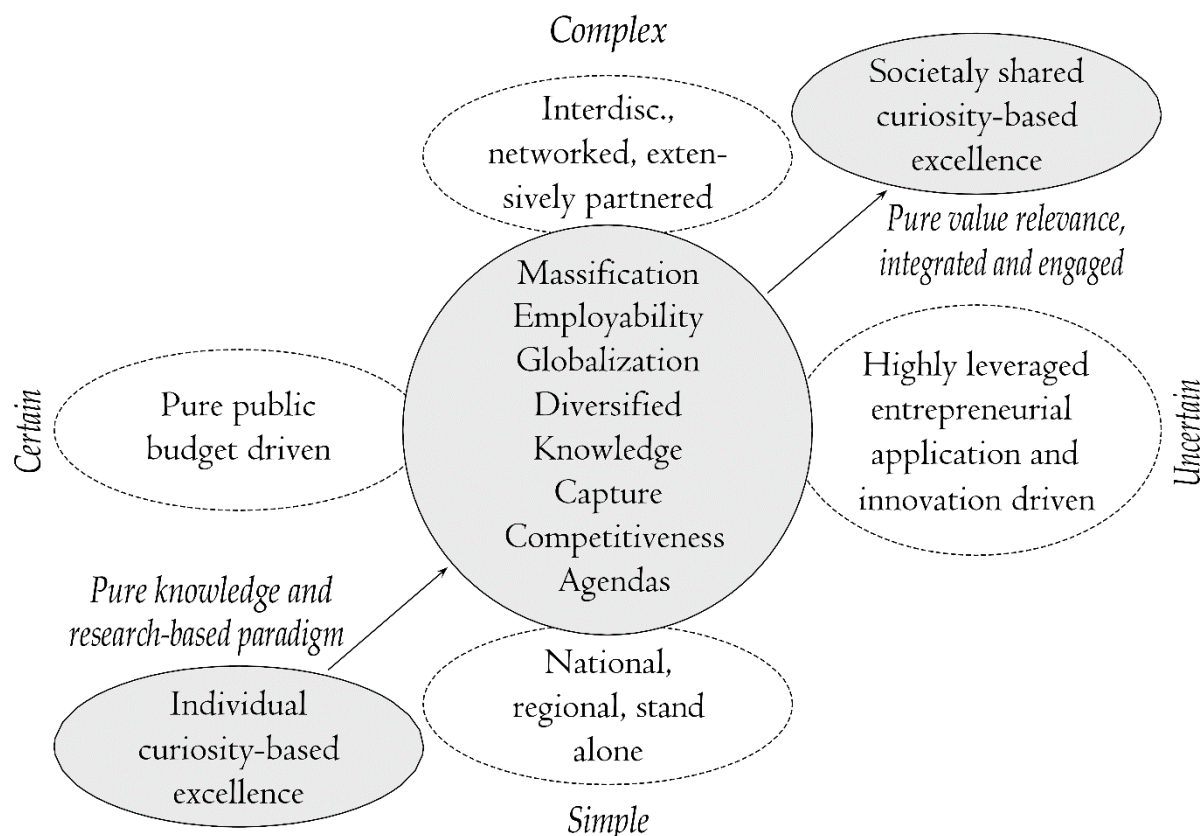


Figure 1: Changing university paradigm

Source: adapted from Gibb, Haskins, and Robertson (2009)

Of major importance is the move to what has been labelled the massification of the education offer from the university sector. It is difficult, if not impossible for this growth in demand to be wholly funded by the state. This leads in turn to the creation of a more openly competitive market for students, requiring a more entrepreneurial response from institutions and it is also leading to a more critical and demanding student consumer group many of whom are now funding more of their own education through personal debt. The global downturn has also impacted substantially on the issue of the employability of graduates. However, this issue goes beyond that of simple graduate unemployment and employment prospects. Now there are calls by industry and indeed governments for graduate education to incorporate a greater skill focus across the whole curricula. Employers express need for graduates to be equipped with a range of enterprising skills with foci upon creativity, capacity for innovation, networking relationship management and risk taking. This need is calling for the development of the Entrepreneurial Mindset in the student population. But industry needs to move beyond industry demand towards articulating the need to equip students at all levels in the education system with personal entrepreneurial capacities to deal with greater levels of uncertainty and complexity in both their work and personal life and that way entrepreneurship becomes almost an intra-disciplinary concept intrinsic to the development of all students and teaching staff (Gibb et al. 2009).

In the context of a global labour market internationalisation is seen as part of a competitive strategy to improve quality of staff and students via overseas recruitment as well as a means of enhancing student experience and existing staff development. Commitment to it involves elements of entrepreneurial risk taking and strategic choice. Prestige, not finance, appears to be a major motivation. Also, there has been a substantial growth of student societies in universities

across the world, with many of them linked internationally in partnership. These societies become a mechanism for articulating student need to the university and demand for entrepreneurship programmes across the whole curriculum.

A major influence upon the drive to internationalisation is the rise of the global knowledge economy accessed substantially through the internet. The web has effectively eaten into the local and national monopoly of knowledge that universities have traditionally enjoyed. The sharing of experiential and tacit knowledge via the internet also exposes know how position of universities. That way academe is confronted with the challenge of becoming more of a learning organisation rather than solely a learned organisation, opening itself up to learning from a wider range of stakeholder sources (Gibb et al. 2009). In the developed economies, active university engagement in knowledge exchange has also been substantially driven by a public policy agenda which has placed higher education firmly in the forefront of enhancement of national innovation and competitiveness.

Triple Helix

While much of the discussion of the Triple Helix model is narrowly focused upon knowledge transfer, universities have increasingly been drawn into a playing a stronger regional social and economic development role in many other ways (Arbo and Benneworth 2008). While they are often important employees and indirect job generators in a region in their own right, they can take on the mantle of being a leading network hub for focus upon regional development issues. They can act as animators for the development of sustainable networks of exchange on important issues. They can focus upon supplying skilled young people to a region and are a mechanism for enhancing social mobility. Through their outreach education and training programmes, they can seek to bring forward the future and act as a major learning source for regional stakeholders. They can, through their reputation and specialist expertise, play an important role in attracting investment to a region. Via research they throw independent light on key development issues and act as a means for independent evaluation. They are often an exporter, bringing in income to a region: but also, through their internationalisation work, they can bring major contacts into the locality and thus raise its visibility and capacity to build networks abroad. They also often act as an intermediary in articulating regional development issues to central government in areas of technology policy, education and skills development and competition policy. Overall, they may take a central place in the development of many aspects of a region's culture (Gibb et al. 2009). There is clear evidence that across Europe universities are taking on more of the role of bridging local with global (Arbo and Benneworth 2008). Whether an individual university wishes to play a transformational role as a regional change agent is, however, an issue for its individual mission and strategy. Throughout the world there has been a gradual evolution in the way that universities are funded, as public budgets fail to take the strain of rapidly growing student numbers (Williams 2009). The detail is more complex and depends upon the mix of funding. Altogether, the financing issue is yet another central focus for entrepreneurial management, with considerable risk attached, not only of a simple resource nature.

University as an Entrepreneurial Organisation

Much emphasis has been placed by many of the referenced authors to the need for a university to be highly flexible in its response to the environment described above. The combination of different demands being made by government, still a major source of funding, via processes of quality measures rather than direct control, combined with the competitive market and stakeholder demands, have presented considerable challenges to university organisation design around the world (Pilbeam 2008).

Hannon (2008) expressed his vision of the entrepreneurial future as follows:

- The Entrepreneurial University

- The Entrepreneurial Graduate Career
- The Entrepreneurial Educator
- The Entrepreneurial Stakeholder Partner
- Delivering the Entrepreneurial Outcomes (Framework)

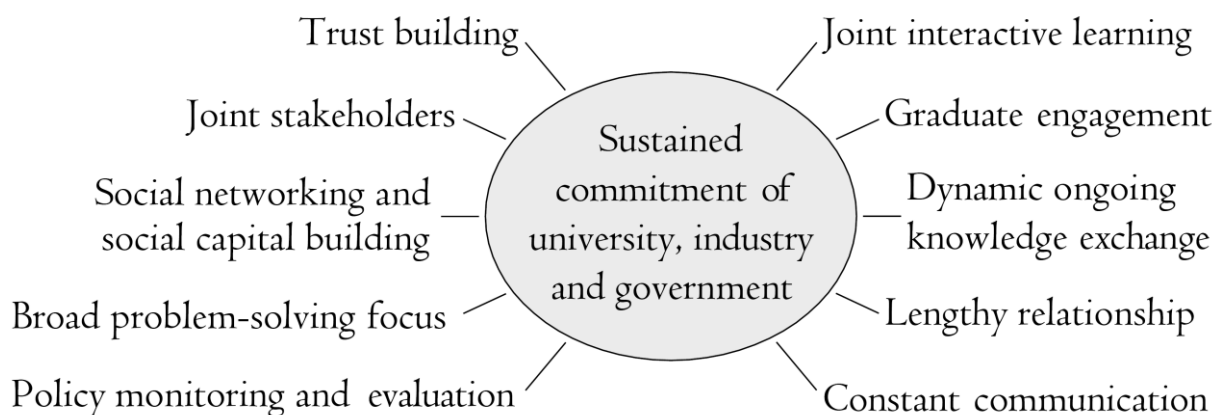


Figure 2: The Basis of Triple Helix

Source: adapted from Gibb, Haskins, and Robertson (2009)

Focus here will be on entrepreneurial university since that is the topic of this article. Hannon (2008) defines the entrepreneurial university as an institution with the following characteristics:

- A great environment for encouraging entrepreneurial behaviours, thinking and opportunity;
- Cross-campus approach creating access to all students;
- Multi-disciplinary working across academic faculties and departments;
- Engages external stakeholders in the design and delivery of entrepreneurship provision;
- Has strong institutional leadership and support;
- Staff/student rewards and incentives
- Takes a broad approach to entrepreneurship to be more than starting a business;
- Teaching focuses on *for* rather than *about* entrepreneurship.

Perhaps the most influential writer in this field, Burton Clark (2004), argues on the basis of a number of case studies, for five key components of entrepreneurial university organisation:

- A strong central steering core to embrace management groups and academics;
- An expanded development periphery involving a growth of units that reaches out beyond the traditional areas in the university;
- Diversity in the funding base, not only by use of government third stream funding but from a wide variety of sources;
- A stimulated academic heartland with academics committed to the entrepreneurial concept; and
- An integrated entrepreneurial culture defined in terms of common commitment to change.

Etzkowitz (2004), another leading writer on this issue, puts forward five propositions concerning the entrepreneurial university concept namely that such institutions are focused upon:

- The capitalisation of knowledge;
- Managing interdependence with industry and government;
- Are nevertheless independent of any particular sphere;
- Are *hybrid* in managing the tension between independence and interdependence and
- Embody reflexivity, involving continuous renewal of internal structures.

The observations of these writers and others can be plotted against a broader conceptual frame setting out key components of an organisation moving to cope entrepreneurially with high levels of uncertainty and complexity. Such an organisation is designed to maximise the use of effective entrepreneurial behaviour appropriate to the task environment. Figure 3 presents such a framework for evaluation of the broad entrepreneurial challenge to university organisation design (Gibb et al. 2009).

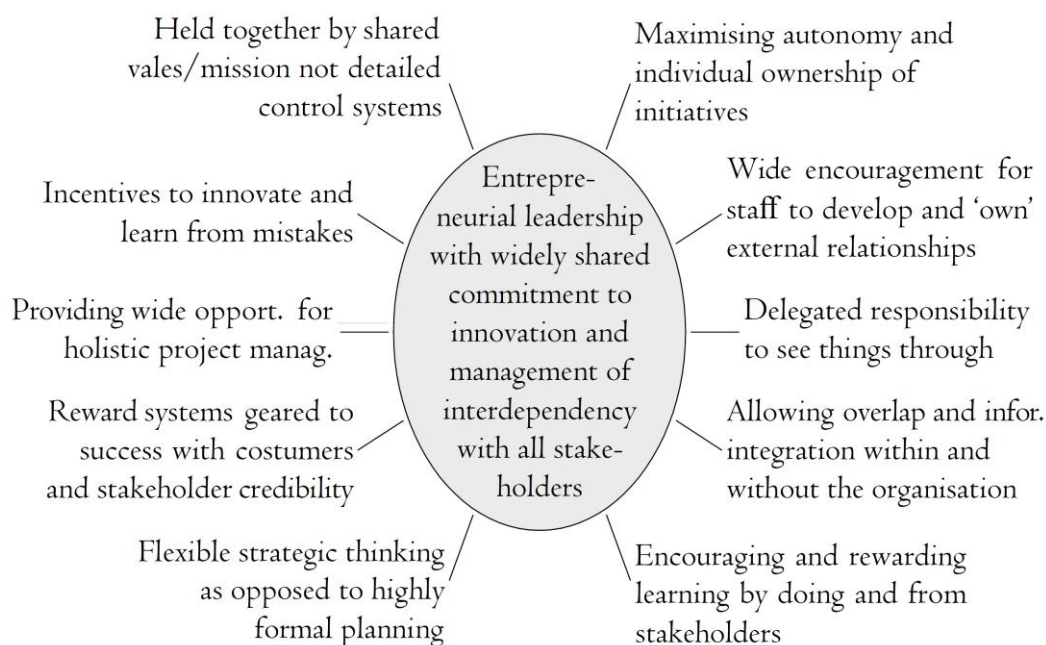


Figure 3: University as an Entrepreneurial Organization

Source: adapted from Gibb, Haskins, and Robertson (2009)

It has been argued that, in terms of organisation, entrepreneurial universities are managed in such a way that they become capable of responding flexibly, strategically and yet coherently to opportunities in the environment. Burton Clark (1998) describes this as having a strong steering core with acceptance of a model of self-made autonomy (as opposed to it being bought by the public purse) across the academic departments. University’s need to transform and change is a result of various factors such as governmental and funding pressures, changes in the society, massification of higher education, globalization, rising number of private higher education institutions etc. Creation of entrepreneurial university is a result of mentioned influences and internal development of the university itself. Governments in virtually all parts of the world are focusing on the potential of the university as a resource to enhance innovation environments and create a regime of science-based economic development (Etzkowitz and Leydesdorff 2000). A university becomes entrepreneurial to respond to the changes in its environment and to ensure socio-economic development and improve its own financial situation. Universities have emerged as one of the key anchor institutions within regions (Smallbone et al., 2015) and their strong relationships with government and industry have been found to be fundamental to competitive advantage and growth (Guerrero et al., 2015; Van Looy et al., 2011). Universities have been faced with difficult challenges which required them to rethink their business models and become more entrepreneurial (McAdam et al., 2017).

CASE OF UNIVERSITY OF ZENICA

Bosnia and Herzegovina has a complex political structure on three levels state, entity and canton. On the state level there is no single ministry dealing with education. The authority over education is given to the two entities: The Federation of Bosnia and Herzegovina and Republika Srpska. In Republika Srpska a single ministry of education manages the educational sector, including

higher education. There are two Universities: University of Banja Luka and East Sarajevo. In the Federation of Bosnia and Herzegovina, the Federal Ministry of Education has transferred the authority of education to the ten cantons, so that each canton has its own ministry of education, which is also in charge of Higher Education. Out of 10 only 5 cantons have Universities, and these are: Sarajevo, Tuzla, Bihać, Zenica and two Universities of Mostar. No legislation or procedural mechanisms ensure the homogeneity of academic standards or allow the comparative assessment of the performance of academic institutions. Such situation creates that higher education in Bosnia and Herzegovina faces unresolved issues of governance at the levels both of coordination and the management of institutions. To achieve development goals government structures at all levels in Bosnia and Herzegovina need to stimulate entrepreneurial mindsets of young people and foster establishment of culture that is friendlier to entrepreneurship. Education institutions play a key role in achievement of these goals. As already mentioned, universities in Bosnia and Herzegovina have been facing the need for reforming the higher education sector, as well as all other segments of the society and economy, after signing the Dayton peace agreement. After signing the Bologna declaration by the government in Bosnia and Herzegovina, higher education institutions were facing the necessity of implementing numerous organizational changes. Universities in Bosnia and Herzegovina are traditionally teaching and research universities with traditional organizational structure and culture. The process of transformation to entrepreneurial universities is necessary and inevitable to ensure development of university and society as whole. Considering the specific constitutional and political conditions in Bosnia and Herzegovina and the ongoing higher education reform, the transformation of universities will be hard and long-term process. In the past ten years small steps forward have been made in the reform of higher education system. A much stronger commitment towards changes is needed within the academic community itself, since the universities have been slowly adapting to new and changing environment.

The subject of this research is the University of Zenica, the youngest university in Bosnia and Herzegovina, formed in October 18, 2000. The University is comprised of eight faculties and several institutions located in the university campus in the heart of Zenica city. As one of the first Bosnian Universities, the University of Zenica finished complete regulation for the Bologna Declaration about registration, university autonomy, ECTS system, joint chairs, quality management, university integration, etc. That means, in the case of the University of Zenica, that the University is fully integrated, and faculties, institutes and centres are organizational units inside the university without formal or financial autonomy. Today, the University of Zenica counts about 5,000 students and employs more than 300 professors, as- assistants and other staff, full or part time.

Method

The transformation of a traditional teaching university, like University in Zenica, depends on the ability of its management to re-define the university's mission statement, develop strategic development plans, implement the necessary organizational changes, develop and strengthen entrepreneurial organizational culture of the institution and promote the necessity of the transformation process in the academic community and in the public. To determine the perception of the University in Zenica and its current characteristics, a survey has been conducted in 2010 and in 2017. The aim was to determine changes and necessity, as well as basis for further framework for transformation towards an entrepreneurial university.

Results

The necessity of this transformation was evident in 2010 (Table 1) when taking in consideration the fact that 78% of questioned employees finds that University in Zenica is not entrepreneurial and 56% stated that University is not autonomous. In 2017 (Table 2) this changed, and we can

see that employees are more optimistic and forthcoming toward idea of entrepreneurial university. One of the fundamental characteristics of an entrepreneurial university is relationship with its stakeholders. In the survey all the examined employees stated that the relationship and cooperation between the University and its stakeholders is very important which implies that they realise importance of the university-stakeholders relationship. And when asked about the influence of the environment on the University 89% of respondents stated that the University is influenced by trends and affected by its environment, among which 33% stressed out the negative environmental influences on the University itself. Because two thirds (66%) of the examinees pointed out the positive influence of environment on the University, it becomes clear that the relationship university-stakeholders is not disturbed much. Therefore, it is important for University to use this as an advantage and to regain, where needed, a closer cooperation with its stakeholders, especially with external stakeholders. In order to answer to these challenges and use environmental influences to its advantage, the University in Zenica needs to become more entrepreneurial.

Table 1. Presentation of 2010 survey results (%)

Question	Yes	No
Is the University of Zenica an entrepreneurial university?	22	78
Is the University of Zenica autonomous?	44	56
Is the academic community interested in change at the University?	44	56

Source: Authors research

An entrepreneurial university should deliver attractive, innovative and business-oriented knowledge to its students. The results of the survey showed that 78% of University employees think that the knowledge transferred to students at the University in Zenica is not compatible with the needs of the business environment. And, they all think that a modernization of the curricula is needed. In the last seven years modernization of the curricula was inevitable and it happened so in 2017 survey 55% of University employees think that the knowledge transferred to students at the University in Zenica is not compatible with the needs of the business environment. Still university is improving and plans to improve its curriculum which should be based on the practical, innovative knowledge while, at the same time, preparing the students for the modern business world and practices.

Table 2. Presentation of 2017 survey results (%)

Question	Yes	No
Is the University of Zenica an entrepreneurial university?	35	65
Is the University of Zenica autonomous?	41	59
Is the academic community interested in change at the University?	59	41

Source: Authors research

The University in Zenica needed to implement the necessary changes to resolve mentioned problems. According to the results of the survey 56% of questioned employees think that the academic community is not interested in change of the University, which change significantly in 2017 to 41%. This means that there are enough academics that are willing to make changes and to make breakthrough toward entrepreneurial university. But still, according to current situation, academe still needs encouragement and motivation. To successfully implement organizational changes and experience development, management of the University needs to encourage changes and accent their benefits for the institution and its employees.

CONCLUSIONS AND RECOMMENDATIONS

The university is one of the world's most durable institutions and now it must pass a complex new test. The new quality of international competition changes the role and function of universities and research systems dramatically. In the midst of crisis, it is important to support all contributors to an entrepreneurial economy. Universities as centres for knowledge creation and diffusion can be leveraged to generate future economic growth. The main question – What kind of a university do we need today? – has a rather simple answer, a university which will meet the needs of a dynamic and turbulent working and life environment in a best way. University must become entrepreneurial to ensure its development. The need of strengthening relations between the universities, business sector and government is evident. An entrepreneurial university should ensure building of its sustainability, and to become a desirable partner for the business and government sector. To achieve mentioned goals, a university needs to be unique, autonomous, and responsible towards its environment. This is the only way for universities to be able to respond faster and in a better manner to changes in the environment, produce practical, business-oriented knowledge, educate people who will be able to manage their own careers, deal with the reality and complexity of the business world, and contribute to the society's development.

Analysis of University in Zenica indicates that the University of Zenica was a little bit far from becoming the entrepreneurial one and through its maturity this change. It still has a way to go to become entrepreneurial. This is mostly because of some key problems like still low level of university autonomy, difficult financial situation, inadequate organization of some organisational parts, compatibility of transferred knowledge. There are several activities which need to be undertaken. Some of them include activities aimed to stimulation and encouragement of process of change at the University, increase of institutional autonomy, change of the financing system of higher education institutions, creation of innovative, business-oriented curricula, introduction of up-to-date teaching methods, and activities aimed to strengthening relationship university-stakeholder.

All change may not be good. All continuity may not be bad. That means that a blunt and unstructured transformation of the university can result in reduction in prestige, decrease in academic quality, uncertain long term financial performance, and reduction in the number of students and sponsors. The transformation of a university into an entrepreneurial one must be adequately managed and controlled.

Creation of an entrepreneurial culture in a university environment is a complex task and a long-term process that requires the efforts of many dedicated individuals. All of them need to understand what an entrepreneurial university is, and how important it is for the socio-economic development of a society. These individuals are in industry, academe, and government, and often are only loosely coordinated in their activities with one another. But they all should share a common passion to provide new and expanded opportunities for the state's economy and citizens.

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UNIVERSITY BUSINESS COOPERATION IN TERMS OF STAKEHOLDERS

Tomasz Kusio¹

Abstract: *Universities as knowledge providers from one part and businesses as knowledge users from the second part need the cooperation ties. This need for businesses results from the need of open innovations and for universities from the need of the social responsibility as well as academic engagement. The processes of open innovations are of even more importance in the shared economy where the access to resources matters more than the resources possession.*

The goal of the cooperation is not just the knowledge usage, but also the incentives for new knowledge creation. The need for cooperation activities is of no doubt and not even discussion, but the question that arises is how this cooperation should be materialized both in terms of the initiation and the development. The issues of relations though relatively concerned as simple and easy in practice are in the perspective of strategic building of the academic engagement complex processes.

This, as is probably clearly understood is the matter of people or as is formulated definitionally – human resources. However the term human resources as once had been addressed to the employees, no matter at which organizational division level they were employed, is now more often socially directed. This results from the servicing function of the economy where networking is of special importance alongside with the value creation. Therefore the term stakeholders had appeared and this term, when employees are concerned, is even narrowed to internal stakeholders. Internal stakeholders are represented by different groups of interests at the organization and when it comes to the university business cooperation the specification and definition of these groups may refer both to the organizations themselves, but also beyond the universities and businesses.

When it comes to the evidencing of the stakeholders there is still the gap in identification of all the stakeholders and to even more extent the stakeholders as those grouped and considered differentially. As there are different organizations they also have different stakeholders even though there may be the same academic orientation of universities. The uniqueness of academic performance is accompanied by the uniqueness of their stakeholders both internal and external. Therefore the need for the systematization of the stakeholder is needed so as to contribute to the topics of stakeholders at the level of university-business cooperation.

Keywords: *stakeholders, UB cooperation, higher education, entrepreneurship,*

JEL Classification: *A 13, I 23, O 31, O 32*

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INTRODUCTION

The role of a university does not seem to be nowadays marginalized but it still rises. Although the literature has already undelined the importance of of university engagement in the processes of open innovation, it concentrates now on both appropriateness and intensity. The topic of university engagement becomes more socially-oriented and remains at the knowledge deepening stage as well as teh expansion stage which is a reason of socially-responsible management as understood universally – at the level of businesses, nonprofits, public administration units and finally businesses.

As the university engagement has been the definition of the behavioral nature, culture of university behavior, it strongly refers to the strategic goals with long-perspective of university functioning, both in terms of mission and vision. The functioning processes at universities are based on resources and the human resources, when the culture is concerned, are of a special attention. Human nature of academic engagement seems to be obvious though not enough unerlined but studies.

When it comes to human nature of acaemic engagement processes, the definition of stakeholders is naturally concernned as the term of these interested parties who are both subjects of culture as well as the factor mostly influencing the culture, the entrepreneurial culture. The culture consists of (Jonas et al., 2007):

- beliefs,
- values,
- problem-solving practices,
- practice of managing relations with stakeholders.

Universities in a different way perform the processes of making universiteis more socially engaged or more entrepreneurial. Therefore there are series of different university intitatives which goal is to make the university more entrepreneurial. This refers to different target groups and has been performed by different groups. From one part the internal stakeholders representing university is concerned and from the other part the target group, who can be both the external groups or stakeholders but also university stakehloders (internal stakeholders). Therefore, the processes of university engagement activities may be duscussed taking into consideration the groups of different stakeholders.

There is still gap and lack of evidence of all the stakeholders and to even more extent the stakeholders as those grouped and considered differentially. Along within the uniqueness of academic perfomance at universities, where each university operates differently and also the groups of stakeholders are different there is nowhere the indication of to what extent these stakeholders matter for the university. As the innovation intensity is becoming now the imperative of economic processes and thus influences the innovation processes at universities, the issue of business stakeholders starts to matter more. At this point the question on how practically the processes of cooperation between the stakeholders look like appears.

The goal of this paper is to identify different stakeholders of university-business, cooperation while the presentation of different international initiatives of making university more entrepreneurial. The considered case studies are sourced from the HEInnovate meeting which took part in Ruse University, Bulgaria, where the Author took part.

LITERATURE REVIEW

Entrepreneurship can be defined on the basis of three levels: micro, meso and macro. In micro terms, we refer to organizational entrepreneurship, and in macro terms - it is about entrepreneurship in a global, regional or national context (Bratnicki & Dyduch, 2017).

Organizational entrepreneurship, at the strategic level, in Hitt's model of the Entrepreneurial Entrepreneurship, at the starting stage, includes interconnectedness (being placed among other environmental factors), where new organizational capabilities are built through networks and social capital, and resource gaps are overcome. In addition, at the level of individual resources, an important role is given to individual resources in the form of social skills that underlie the building of social capital. Supplementing of an access to resources is one of the important roles that the university provides for those organizations that need these resources in a special way to meet the demands of innovation. Innovation should be considered as key feature alongside with flexibility, openness and value generation for stakeholders in business models, in particular in e-business models (Karwowski, 2017, p. 53).

Building a network of links between universities and other entities, including business in particular, is an answer to building capital for the emergence of open innovation. The role of the university, in this case as an institution naturally aware of the need to meet the needs of filling the gap in access to knowledge and innovative solutions for SMEs, among others, is now a necessity. More and more attention is also paid to filling the gap in the social needs that society faces in relation to universities.

The vision of the Entrepreneurial University is realized both at the institutional level and, above all, at the level of individual interpersonal relations. Increasing the level of entrepreneurship is influenced by the nature of these relations and the parties who participate in them.

The communication channels within the framework of the UB network can be divided into individual and institutional channels. The institutional characteristics shall include the type and size of organization, the source of funding, the number of staff in the undertaking and the number of staff in the establishment, the commitment and the outcome. In turn, the individual characteristics relate to the number of joint publications, the researcher's status and his or her experience (Puerta-Sierra et al., 2017).

Stakeholders are defined as individuals but also as groups identified by organizations with respect to the processes, projects, projects or goals of the organization that they can influence or under which they are influenced (Kozłowska, 2015, p. 75). In turn, networks can be defined as a source of social capital as a resource of cooperating actors (Shulkina, 2017, p. 360):

- people
- groups,
- society,
- organizations.

The above proposed division of parties of mutual interactions can exist in different configurations (Fig.1).

Partner cooperation between stakeholders can evolve and change. In addition, the indicated areas of interaction can also be defined in the context of the notion of stakeholders. The definition of stakeholders includes both individual, as well as group and social level. In other words, stakeholders can be understood on an individual basis, as individuals, as well as in a group or institutional approach, i.e. organizations, companies, institutions, including also individual internal stakeholders for a given organization. The strength of the impact and impact is therefore important.

Institutional relations are implemented by the representatives of the organization. These are people who represent the demand for knowledge at the level of an organization - that is, the demand for complex and complementary knowledge. For this reason, one can distinguish a group of stakeholders representing a given organizational unit - intermediaries. In relation to information exchange intermediaries, you can both name individuals, people, so-called brokers

or a group of people with a more or less extensive structure, e.g. knowledge transfer units or technology transfer centers.

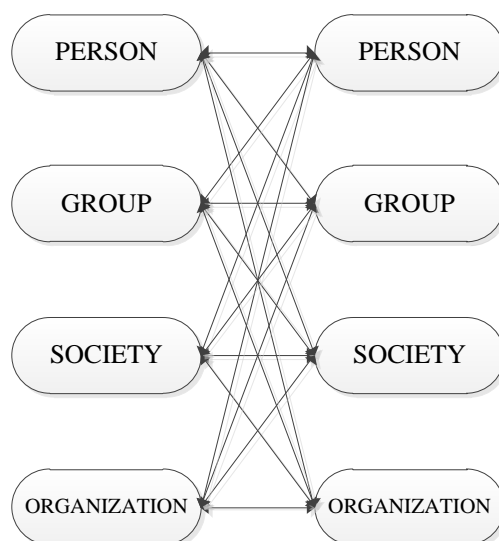


Figure 1. Mutual network interactions between stakeholders with different numbers of people
Source: Author

When it comes to establishing, deepening and maintaining a science-business relationship, there are different qualifications of stakeholders influencing the creation of these relationships, including:

- academic teachers,
- university managers,
- Students,
- internal intermediaries,
- external intermediaries,
- public administration, including the central government,
- business representatives.

Internal stakeholders of an organization may appear in equivalent or more or less hierarchical relations. As far as universities are concerned, the traditional teacher-student relationship is still in place. In the future, according to some experts, the form of interaction, where parties are knowledge providers and recipients of knowledge, may differ from existing patterns. On the knowledge transferring side, there may be not only a single person - a professor or a teacher, but rather a team of professors or teachers. A similar type of knowledge exchange may mean the need for new competences on the teacher's side (Sahlberg, 2018, p. 8-9).

In external relations, the university's stakeholders communicate with business stakeholders. The process of mutual interactions can be direct or indirect. The object of establishing relationships may also be different. i.e. research and educational issues. The propensity of both individual colleagues and the tendency at the institutional level to develop educational programs in network cooperation, which would allow to implement individual educational paths by students, is highly evaluated by the representatives of science (Shulkina, 2017, p. 364).

METHODOLOGY

In order to identify the stakeholders of the entrepreneurial university, three initiatives implemented by three different European universities were selected and analyzed:

1. Varna University of Management, Bulgaria, BEEHIVE project
2. University of Ljubljana, Faculty of Electrical Engineering, LTFE
3. Technical University of Sofia, Faculty of Management

One case refers to a university-wide initiative funded from external funds, two other cases refer to the departmental initiatives.

Comparative analysis of the case studies allows to compare the identified stakeholders of each of the differing initiatives in three independent academic centers. The comparative analysis includes the indication of the objectives of the activities and the expected results as well as the adequacy of the stakeholders constituting the target groups or to which the actions are addressed, among others disseminating, that is, acting on particular groups of people. The analysis is based on materials sent to the EU as part of the HEInnovate initiative, an initiative of the OECD Local Economic and Employment Development Program (LEED). Each initiative was presented at the HEInnovate Conference: Supporting Institutional Change in Higher Education, Ruse University 'Angel Kanchev', 14-15 June 2018.

RESULTS AND DISCUSSION

In each of the presented cases of the analyzed comparative cases, responsible groups of both internal and external stakeholders were indicated – table 1.

Table 1. Three examples of EU universities initiatives leading to their transformation into more entrepreneurial ones

Name of higher education institution	Objectives and expected outcomes of the initiative	Key stakeholders (inside and outside the HEI)
Varna University of Management, Bulgaria	<p>The BEEHIVE project's overall objective is to build sustainable university-based entrepreneurial ecosystems at higher education institutions in Indonesia and the Philippines, and to enhance their students' and graduates' employability and ability to create jobs. Furthermore, BEEHIVE strives to support the partner universities' transformation into entrepreneurial universities.</p> <p>Key outcomes:</p> <ol style="list-style-type: none"> 1. Towards the Entrepreneurial University National Benchmarking Reports for Indonesia and the Philippines to map out and benchmark the status of universities in Indonesia and the Philippines towards an alignment with the entrepreneurial university concept. 2. Massive Open Online Course (MOOC) Entrepreneurship for All to disseminate up-to-date training and knowledge in the field of entrepreneurship across the campuses of the Indonesian and Philippine universities involved and to build their students entrepreneurial skills. At least 1000 students are to benefit from the MOOC delivered in English through the project website. 3. BEEHIVE Accelerator Programme induced at the partner universities to create entrepreneurship-based self-employment opportunities through streamlined business start-up support in the framework of five designated seed accelerators. 	<p>BEEHIVE primary target groups are:</p> <ol style="list-style-type: none"> 1. Students and graduates of the five partner universities in Indonesia and the Philippines who are benefitting first-hand from the Entrepreneurship for all MOOC and the BEEHIVE Accelerator Programme. 2. Indonesian and Philippine partner universities' academic communities at large, incl. their senior management and faculty who capitalize on the BEEHIVE National Benchmarking Reports findings and the BEEHIVE Label award. <p>BEEHIVE secondary target groups include students, alumni, faculty and senior management of universities in Indonesia and the Philippines that are not members of the BEEHIVE consortium; Indonesian and Philippine universities' business partners; companies, business investors and venture capitalists, civil society representatives, policy makers and public authorities supporting start-ups in Indonesia and the Philippines.</p>

	<p>At least ten business start-ups will be established through the BEEHIVE. 4. BEEHIVE Label designed to empower Indonesian and Philippine universities to transform gradually into entrepreneurial universities through the evaluation of their entrepreneurial ecosystems' excellence. At least three universities will be certified and awarded a BEEHIVE Label in the course of the final third project year.</p>	
<p>University of Ljubljana, Faculty of Electrical Engineering, LTFE</p>	<p>FabLab Network is a platform for learning, intergenerational integration, creativity and for support of creative makers, start-ups and companies.</p> <p>Objectives:</p> <p>To build a technologically supported environment for innovation, prototyping and invention To encourage circular economy and local entrepreneurship</p> <p>To encourage innovation and the development in local economy</p> <p>STEM promotion (Science Technology Engineering and Math)</p> <p>Network of mentors (experts), sharing equipment (different)</p>	<p>Creators In the Fablabs creators and other talents can develop their ideas into the prototypes that will later on be tested in the market</p> <p>Companies Companies use the equipment, have access to the talents and future workers or they can train their worker in the Fablabs</p> <p>Schools Schools can enrich their curriculum with practical lessons and include the students through the work in real projects.</p> <p>Local communities Local communities can use Fablabs to offer local inhabitants possibility of quality life, work and innovation in the home environment</p>
<p>Technical University of Sofia, Faculty of Management</p>	<p>The OS.University project aims to provide students, graduates, entrepreneurs and employees with a credible digital credentials wallet, which enables them to find the best academic and career development opportunities by getting them connected to academic and professional development opportunities through the data, regarding their accomplishments and achievements, logged and verified on the decentralized (Ethereum) blockchain.</p>	<p>3 key stakeholder groups: Learners - includes students and employees gaining new knowledge, lifelong learners and curious minds who are seeking challenges and/or new academic or professional paths. Businesses - includes companies of various sizes from startups to enterprises, NGOs, institutions, seeking better and faster candidate sourcing, optimization of costs & results, and improvement of employee recognition. Academia – includes high schools, universities, MOOC platforms, corporate training and non-formal education providers, independent experts, organizations in the field of education & professional development.</p>

Source: Texts drawn from materials sent for the HEInnovate: Supporting Institutional Change in Higher Education, Ruse University 'Angel Kanchev', 14-15 June 2018

In the context of the Bulgarian University, a group of stakeholders was recognized as a group of university communities, both those that implement the project (in the first place students and graduates, as the primary target group), as well as the broadly understood academic communities of these universities. As the second target group, those universities of countries participating in the project were considered, whose project is not directly concerned, but in which the results will probably become popular. The following were also considered as stakeholders: business partners of universities, companies, investors, venture capital funds, social representatives, decision makers, as well as public authorities supporting the development of entrepreneurship.

The analysis of the FabLAB initiative indicates the separation of four groups of stakeholders, ie: creators, companies, schools, local communities. Within individual groups defined according to the implemented project and target groups and groups disseminating project results, there are university and business communities as well as social representatives and public authorities.

Three key stakeholder groups were identified in the Technical University of Sofia initiative: learners, businesses and academies. In the first group, individuals, learners, including students, were identified as stakeholders, but also other people interested in lifelong learning (LifeLongLearning). In the second group, both business and nonprofits institutions were classified as stakeholders, those seeking suitable candidates for work and cooperation, ie individual persons being presumably part of the "learners" in the project. Education institutions, including higher education, platforms providing access to mass education were recognized as the "academia" stakeholders. The platforms can be understood as the institutions that created such platforms and manage them. Other providers of formal and informal education, including also independent experts were also classified as academia stakeholders.

CONCLUSIONS AND RECOMMENDATIONS

The theory of stakeholders refers directly to still current demands of creating an entrepreneurial university. In the theory of stakeholders, the organization operates basing on relationship with, among others: customers, suppliers, and suppliers of new ideas and ideas. In turn, in the currently increasingly demanded necessity of the ever-wider opening of universities to the environment, attention is paid to the third mission of the university, social responsibility or the social sensitivity of the university. The considered academic involvement refers to stakeholders who represent, among others, business environment as well as society. Taking into account the representation of the society, it is possible to distinguish potential students and their families, in particular in the context of the university's area of education.

As part of the comparative analysis of three case studies, the identification of stakeholders points to a similar tendency to identify them each time, which results from the objectives of the initiatives. Stakeholders are therefore defined in the first place because of the goals of implemented initiatives, and later on taking into account the type of group represented. Stakeholders are also defined quantitatively, i.e. as individual representatives, as well as by group, ie as groups of persons. Another option of identifying stakeholders is the institutional criterion, ie the division into personal and institutional stakeholders. Finally, stakeholders are classified according to the sectors they represent, i.e. society, educational institutions, business sector institutions and public administration sector institutions. One of the criteria for identifying stakeholders is also the criterion of belonging to the network. The stakeholders from the network and from outside the network are identified, regardless of the geographical location. In each case, among the identified stakeholders there are both internal and external stakeholders.

Academic engagement, which means the university orientation on its surroundings issues, means the orientation of the university on the affairs of representatives of this environment. The university's involvement thus becomes the management of relations with current stakeholders

and those who, through relational activities, become university stakeholders. As a stakeholder-oriented approach, the culture of employee learning propagated in the organization is acknowledged, providing all parties interacting with the organization with satisfaction (Kozłowska, 2015, p.78).

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THE ROLE OF UNIVERSITY IN DESIGN AND IMPLEMENTATION OF SMART SPECIALISATION STRATEGY

Bojan Pavlović¹

Abstract: *Universities could have pivotal role in the development and implementation of Research and Innovation Strategy for Smart Specialisation (RIS3). Smart specialisation is a model of regional policy based on „bottom-up“ approach, as a matter of fact on cooperation between public, scientific-research and business sector which identify the areas of future specialisation through the entrepreneurial discovery process. RIS3 is a central part of Cohesion Policy of European Union and basic ex-ante conditionality for spending the EU funds aimed for research and innovation. Analyses show that universities are more connected than ever before to the regional economy, having an important impact on competitiveness and performance of regions. Universities are crucial institutions in regional innovation systems, especially in those with absence of a dynamic and research oriented private sector. In order to increase the effects of their activities in all regions, there is a need for better compatibility and interaction between regional, national and European programs for research and development. Discovering the right domains of future specialisation is a challenging process. It is necessary to avoid the mistakes most of the regions do choosing almost the same technology mix and showing the lack of imagination, creativity and strategic vision. Universities, as sources of creation and dissemination of knowledge and innovation, have a critical role to play in this process. The adoption of RIS3 has been aimed in part at significantly increasing funding opportunities for universities, while stimulating them to engage more and in new ways in regional development. The capacity of the regional actors to absorb the funds and direct them to productive research and innovation activities for the region will be the key issue and challenge, and the role of universities' direct engagement in the design and implementation of the smart specialisation strategies will be crucial for their goals to be achieved. The objective of this paper is to look into the role of the universities in smart specialisation strategies' design and implementation, identify opportunities and propose recommendations to stakeholders and policy makers.*

Keywords: *University, Research and Innovation Strategy for Smart Specialisation, Regional Development*

JEL Classification: *O31, O32, O38, R58*

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INTRODUCTION

The Europe 2020 Strategy identifies three key drivers for growth to be implemented at EU and national levels: smart growth (through knowledge, innovation, education and digital society), sustainable growth (production more competitive, more efficient resources) and growth for inclusion in the labor market (greater participation in the labor market, combating poverty). This EU political strategy is supposed to support increasing competitiveness, social cohesion and regional development during the period 2014-2020. The existence of a Strategic Policy Framework for Smart Specialisation is an ex-ante conditionality for the use of European Structural and Investments Funds for funding Research and Innovation. As a part of the Europe 2020 Strategy, Research and Innovation Strategy for Smart Specialisation (RIS3) can potentially have far-reaching implications for regional and national development as well as for overall European competitiveness. The adoption of RIS3 has been aimed in part at significantly increasing funding opportunities for universities, while stimulating them to engage more and in new ways in regional development. The capacity of the regional actors to absorb the funds and direct them to productive research and innovation activities for the region will be the key issue and challenge, and the role of universities' direct engagement in the design and implementation of the smart specialisation strategies will be crucial for their goals to be achieved.

Smart specialisation (S3) is a key underpinning concept governing European Structural Fund investments in research and innovation in the 2014-2020 programming period. It is defined by the European Commission's Smart Specialisation Platform as "a strategic approach to economic development through targeted support to Research and Innovation (R&I)". More generally, smart specialisation involves a process of developing a vision, identifying competitive advantage, setting strategic priorities and making use of smart policies to maximize the knowledge-based development potential of any region, strong or weak, high-tech or low-tech" (European Commission, 2012).

The objective of this paper is to look into the role of the universities in smart specialisation strategies' design and implementation, identify opportunities and propose recommendations to stakeholders and policy makers. To explore the role of universities, this paper is organized as follows: the paper primarily deals with the concept of smart specialization as a new innovation approach, then the involvement of universities in the process of smart specialization, barriers to university involvement, as well as recommendations for stakeholders and policy makers. The paper is based on the extensive literature reviews such as policy briefs, working papers and expert group reports.

SMART SPECIALISATION – NEW INNOVATION APPROACH

Smart specialisation (S3) is a regional policy framework for innovation driven growth (OECD, 2013). The concept was first aired by Foray and Van Ark in 2007, in policy briefing prepared for Knowledge for Growth Expert Group (Foray & Van Ark, 2007), an independent advisory group to the European Commissioner for Research and Innovation. This group of scholars suggested a conceptual framework for thinking about a possible policy-prioritization logic aimed at promoting EU growth, a framework which they labelled smart specialisation (McCann & Ortega-Argiles, 2015).

Barca Report (Barca, 2009) addressed territorial dimensions of Cohesion Policy, making a number of recommendations for the post 2013 programmes, including the need to focus on fewer priorities and for better coordination of place-based policies across the Commission (Kempton et al. 2013). This facilitated the transition of smart specialisation from a wholly sectoral concept to one that is also applicable to regional policy (McCann & Ortega-Argiles, 2011). In the new policy brief (Foray et al. 2009) it was introduced the notion of „entrepreneurial discovery

process“, a bottom-up learning process aimed at identifying „domains“ for future specialisation. It is the central element of the smart specialisation concept that differentiates it from traditional innovation and industry policy frameworks. The role of government is not to select the areas or activities for investing public sources, but to facilitate this ”discovery” to occur and to be supported. It arises from collaborations and discussions within the region, mobilizing a broad range of participants and actors including universities.

The original smart specialisation concept emerged from a spatial sectoral lines of thinking, but it increasingly shifted towards addressing regional growth issues as fundamental building blocks of national and European growth issues (McCann & Ortega-Argiles, 2015). In many European regions there are weak correlation between region’s research and development capabilities, its training specialisations and its industrial structure. The aim is to promote local skills base that can facilitate widespread local incremental improvements across a range of the region’s economic activities, as well as developing more specialized application technologies in the region.

A central tenet of the smart specialisation argument advanced by Foray and others is that governments should focus their knowledge investments in activities that reflect areas where a region or country has some comparative advantage (specialisation) or emerging areas where entrepreneurs could develop new activities (diversification) (OECD, 2013). This connection between specialisation and technological diversification in the context of regional development and growth has been highly influential as it demonstrated that the smart specialisation as a policy framework is very well suited for dealing with the problems of place-based growth (McCann & Ortega-Argiles, 2013).

Smart specialisation is very much an economic framework focused on regions that aims to illustrate – for the purpose of policy making – how public policies, framework conditions, but especially R&D and innovation investment policies – can influence economic, scientific and technological specialisation within a regional framework and through this mechanism, productivity, competitiveness and economic growth (OECD, 2013).

EU regions differ enormously in terms of their levels of development, the extent of urbanization, their industrial structures, environmental features, their population and demographic characteristics, and their institutional and governance systems. In such heterogeneous context there is unlikely to be any particular ”one size fits all” approach which is ideally suited to every regional context.

Discovering the right domains of future specialisation is challenging process. It is necessary to avoid the mistakes most of the regions do choosing almost the same technology mix and showing the lack of imagination, creativity and strategic vision. Universities, as sources of creation and dissemination of knowledge and innovation, have a critical role to play in this process. The question is how this can be achieved in an optimal manner.

UNIVERSITY IN SMART SPECIALISATION PROCESS

There is a general consensus about the importance to include all relevant stakeholders in the definition and implementation of RIS3 and the main actors of the triple helix are universities, government and industry.

It is clear that universities have a potentially pivotal role to play in the social and economic development of their regions. They have long been seen as important actors in regional innovation systems, and the emerging literature on smart specialisation reinforces and even amplifies this role. The fostering of triple helix R&I collaborations should be initiated and undertaken by all the actors – universities, governments (national and regional) and external

partners (industry small and large, intermediate agencies, etc). The mobilization and empowerment of key stakeholders and institutions to realize their potential as leading contributors are essential elements to transform a traditional regional innovation strategies into regional ones for smart specialisation. Successful mobilization of the resources of the universities may also have a strong positive effect on the achievement of comprehensive regional strategies.

Research and Innovation Strategies for Smart Specialisation (RIS3), aiming to foster development by targeted support to research and innovation at regional level, are a quantum leap from promoting regional engagement of universities and other research institutions. In this context regional engagement actions will be considered as a baseline from which to move forward. Universities generate growth opportunities directly through knowledge capitalization activities such as spin-offs, licensing and participation on company boards. Universities analyse gaps in regional innovation environments and play a leading role in organizing networks for the development of a regional innovation strategy.

The universities must be involved in both the design and implementation phases of RIS3. In the design phase, they can contribute to a rigorous assessment of the knowledge assets, capabilities and competencies, including those embedded in their own departments as well as in local businesses. They can identify research domains with significant strengths and a high potential at a national or regional level, contribute to setting strategic priorities and making the right political decisions. In the implementation phase, they can be involved in developing, refining and achieving the RIS3 objectives.

Examples of roles/contributions of universities to smart specialisation (Kempton et al. 2013):

- universities can play a key role in designing smart specialisation strategy by contributing to a rigorous assessment of the region's knowledge assets, capabilities and competences
- universities can contribute to the entrepreneurial discovery process by bringing global awareness and partnerships across regional borders into the frame through evidenced base identification of competitive advantage around which regional strategies and resources can be concentrated
- universities can provide specialist research expertise and links to national and international networks of knowledge, becoming critical agents in the entrepreneurial discovery process
- through their teaching programmes universities can enhance the skills and competences of staff working in the field of economic development through training, consultancy services and supply of graduates, thus improving the capacity of region to deliver smart specialisation
- while a region might possess a strong universities there might be limited absorptive capacity in local enterprises, especially SMEs and branches of multinational companies with no local in-house R&D; universities can contribute to capacity building on the demand side through new business formation, student enterprise and graduate placements as well as encouraging staff to actively engage with local businesses
- in terms of institutional leadership and governance, particularly in regions where local government is fragmented and unable to act beyond its own immediate boundaries, universities as key anchor institutions can play an important role in building the social relations which underpin the regional innovation system for the formulation and indeed, implementation of smart specialisation
- universities can contribute to local knowledge creation and its translation into innovative products and public and private services. In addressing such challenges universities can engage the creative arts and social sciences as well as technical and natural scientists.

The way that universities are integrated into smart specialisation policies should vary between regions depending on the strategic objectives adopted in each specific case. Beneath the

overarching tenet of focusing on particular R&D and innovation strengths linked to existing economic assets, the possible content of smart specialisation strategies have been defined widely enough to accommodate appropriate goals for the different types of regional economies found in the EU (European Commission, 2011).

For instance, the European Commission factsheet on Research and Innovation Strategies for Smart Specialisation highlights five possible pathways for regional innovation and development (European Commission, 2011):

- 1) rejuvenating traditional sectors through higher value-added activities and new market niches
- 2) modernizing by adopting and disseminating new technologies
- 3) diversifying technologically from existing specialisations into related fields
- 4) developing new economic activities through radical technological change and breakthrough innovations
- 5) exploiting new forms of innovation such as open and user-led innovation, social innovation and service innovation

Policy makers and universities themselves should recognize the broader role the universities could play in providing expertise and intelligence in domains such as regional development, education, business, etc. They can play more "developmental" role in shaping and supporting regional institutions, supporting the creation of networks and other capacity building activities, particularly in the "institutionally thin" regions. This role is not directly linked to the entrepreneurial discovery process, but it would help to build regional institutional capacity upon which successful RIS3 strategy implementation will depend.

OBSTACLES TO UNIVERSITIES' ENGAGEMENT IN SMART SPECIALISATION

Smart specialisation represents a new opportunity for collaboration between universities and regions. Universities need to define their research portfolio and to map their research capacities accordingly. Successful partnerships depend on both universities and regional authorities understanding each other's drivers. Too often partnerships fail because university managers do not understand the challenges of regional development and regional authorities do not understand the core mission of universities and the constraints within which they work (Goddard et al. 2013).

EU Guide to Research and Innovation Strategies for Smart Specialisation argues that a wide range of stakeholders have to participate in the entrepreneurial discovery process to ensure that regional innovation system is not considered in isolation and that public investment in R&D is in tune with regional needs and capacity. This guide seeks to ensure that universities are not excluded from the shaping of smart specialisation strategies. From the perspective of local and regional authorities in many member states, higher education is not within their domain of responsibility and as a result they have little understanding of its drivers or leverage over it in terms of achieving regional outcomes. From the perspective of the research intensive university the region is unlikely to be a statutory entity to which it is accountable and regional outcomes such as job generation or enhanced business competitiveness are not a core performance indicator (Goddard et al. 2013).

Huge challenge is to match the academic profiles of universities and regional smart specialisation priorities. The academic profiles of the leading universities are remarkably stable and their researching and teaching specialisations change with very little regard to regional needs and opportunities. Growing support for greater institutional autonomy from the state is enabling universities to defend these academic profiles, including resisting any attempt to steer university towards changing its profile in order to underpin regional specialisation. Excellent and diverse research and teaching base could not be related to the current regional business and labor market

needs, but has the potential to contribute to the long term adaptability. Meanwhile, the regional authorities invest in specialist institutions like technology and innovation centers outside of universities. Although these centers may be designed to act as bridge between a region's established industrial base and universities this does not always happen in practice, not least because of differences in the underlying business drivers of such centers and universities (Goddard et al. 2012).

The university should be an institutional actor in smart specialisation process. Research intensive universities are characteristically composed of relatively independent academic units with only limited co-ordination mechanism between their activities such that responding to external demands and opportunities, including those originating from the region. This co-ordination is easier at the academic unit level rather than the entire university. Regional development perspectives assume all too easily that universities are simple organisations, with hierarchical decision-making and interest-representation structures, overlooking entirely universities' organizational complexity. While such characteristics may make it possible for individual academic units to engage in the entrepreneurial discovery process it could remain a challenge for regional policymakers who need to mobilise an institutional response across disciplines and to contribute to framework conditions such as human capital development and social cohesion (Goddard et al. 2013). So for universities to play an active role in shaping and implementing smart specialisation strategies they may need to adopt 'loose-tight' structures.

CONCLUSION AND RECOMMENDATION

Within the regional economy many different subsystems (sectors, clusters) function in different ways. It would be easy to choose the most dynamic and productive part of economy for entrepreneurial discovery and setting priorities. However, in that case it would be presented quite narrow and exclusive aspect of smart specialisation. It would also be ineffective process of resource allocation because less dynamic parts of economy, which need structural changes (modernization, diversification, transition), also need to be a part of smart specialisation strategy. Smart specialisation must be inclusive. Inclusiveness will imply different paces and tempo of the policy because identifying and prioritizing good projects in the less dynamic parts of the economy will be more difficult and more costly than in the most dynamic parts.

Working together with the public sector, business and other social partners could provide exiting opportunities for universities to broaden their role locally and contribute not only to their engagement mission, but also enhance the impact of their teaching and research, something governments and funding bodies are increasingly looking for.

It is recommended for all EU, national and regional institutions to support the university participation to design and implementation of smart specialisation strategy. European Commission should encourage EU member states to consider the role of universities in national and regional innovation systems when drafting smart specialisation strategies. It should provide guidance how to use the ESIF operational programmes in synergy with HORIZON 2020 research funding programme. At national level policy makers should seek complementarities between EU and national funding programmes. At regional level policy makers at first should understand obstacles and challenges that are preventing a greater level of cooperation between local universities and regional authorities. Further on it is necessary to motivate all key stakeholders to actively participate in defining priorities, RIS3 design and implementation.

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GROWTH INTENTIONS OF EARLY-STAGE ENTREPRENEURS IN SOUTH EAST EUROPE REGION

Bojan Leković¹, Miodrag Petrović²

Abstract: *Through their role, entrepreneurs differently contribute to economic activity and economic development of national economies. Some of them are driven by the development of new products/services and new markets, others see their opportunity in foreign markets, while some of them try to increase their business and number of employees in line with their company's needs. The key issue, as well as the overall orientation of this research, is related to the analysis of the relationship between entrepreneurial knowledge, skills and abilities (KSA's), entrepreneurial motives and internationalization with early-stage entrepreneurial growth intentions. Growth aspiration is a major contribution to the economic development of the countries, because a large number of newly established companies have an enviable potential for enterprise growth and creation of new jobs. Besides the influence of psychological characteristics there is an evident influence of demographic characteristics and the business environment within which it exists. The paper is exploring a particular gap and it can advance the understanding of the importance of determinants of entrepreneurial growth intentions. Although the theory recognizes relationships of variables used in this research, yet there is a significant unexplored area, especially in terms of SEE region. The main objective of this paper is to determine the factors of influence on growth aspired entrepreneurial ventures in order to determine characteristics of these entrepreneurs in SEE region. For the purpose of this research, data from the Global Entrepreneurship Monitor was used. For the purpose of this research, the authors included six countries in research sample of South East Europe: Slovenia, Croatia, Hungary, Romania, Bosnia and Herzegovina, and FYR of Macedonia. An exploratory sample of the mentioned countries was 12027 respondents and 632 entrepreneurs with growth intentions. Based on the nature of observed variables the authors used Spearman's correlation and ordinal logistic regression (ORL). Our findings demonstrate that entrepreneurial motives and internationalization have positive relationship with high-growth entrepreneurial aspirations. Also, we have partially confirmed hypothesis related to positive relationship between entrepreneurial KSA's and entrepreneurial growth intentions. Main research limitation can be recognized in low Nagelkerk coefficient, which is characteristic for social phenomena, because they are complex and multidimensional, so it is very difficult to explain a very big amount of variation.*

Keywords: *Growth intentions, KSA's, Entrepreneurial motives, Internationalization*

JEL Classification: *L26*

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INTRODUCTION

Entrepreneurship as a discipline has become very interesting field of research examined by many researchers. The developed entrepreneurial initiative is a feature of the economies of highly developed countries, it influences economic development, influences the increase of employment rates by generating new jobs, etc. Creating new jobs is the entrepreneurial aspirations for achieving the growth of an entrepreneurial venture. This is a major contribution to the economic development of the countries, because a large number of newly established companies have an enviable potential for enterprise growth and creation of new jobs. Why do some entrepreneurs show a greater tendency towards the aspirations for the growth of an entrepreneurial enterprise, which factors influence the development of this type of entrepreneur's aspiration? Growth aspiration of entrepreneurial endeavors is determined primarily by the individual characteristics of an individual, ie entrepreneur. The impact of personal characteristics of entrepreneurs on the development of entrepreneurial venture aspirations in the form of high growth is evident. However, he is not the only one, besides the influence of psychological characteristics there is an evident influence of demographic characteristics and the business environment within which it exists.

LITERATURE REVIEW

There is an entrepreneurial myth which represents a dilemma whether an entrepreneur is born or can be taught. Although some authors make this an obsolete problem and a staggering theme (Kuratko, 2003), most authors point out the current nature of this dilemma. The authors Gorji and Rahimian (2011) agree with the existence of this dilemma, pointing out that education is a factor of influence on the success/failure of entrepreneurs. There is no question whether entrepreneurs are born or created, no question is whether entrepreneurship can be learned, the central issue is how entrepreneurship can be learned and how entrepreneurial training programs should look like in order to provide adequate knowledge and skills for future entrepreneurs. To a large extent, entrepreneurial intentions are conditioned by the level of knowledge, skills, and abilities (Baum *et al.*, 2001). KSA has long been utilized in the human resource literature as an inclusive term to reflect individual and firm level human capital assets (Cabello-Medina *et al.* 2011). The first entrepreneurial competency is human capital. It has been identified in prior studies as a competency with a significant influence of entrepreneurial growth expectations. (Bosma *et al.* 2004). Human capital is complex and often intangible, so education has traditionally been used as a non-task related human capital attribute (Cassar 2006). Beside education, self-efficacy can be observed as another human capital attribute. Self-efficacy can compensate lack of resources, such as financial resources, which is constraint for many entrepreneurs (Chandler and Hanks, 1998). The concept of collaborative entrepreneurship is based on the creation of something of economic value arising out of new, jointly created ideas that emerge from the sharing of information and knowledge (Kenney & Mujtaba, 2007). Most of the entrepreneurial ventures were created through collaboration. The application of this concept is based on the exploitation of the opportunities provided by the process of networking, which has been linked with to firm growth (Ostgaard and Birley, 1994). Among previous mentioned competences, authors of this paper also induce alertness (Baum *et al.* 2001) as a perception of good opportunities for starting a business and fear of failure (Palich 1995) as a risk aversion. Based on the previously presented views, the authors of the paper defined the following hypothesis:

H1: Entrepreneurial knowledge, skills and abilities are positively related to the growth expectations of entrepreneurs in South East Europe region.

Considering theories of motivation and achieving the degree of economic development of the country we can talk about the different degree of satisfaction of the needs of the individual but

also the needs that are not satisfied, which is the basic driving force and motivation for the realization of different forms of entrepreneurial endeavors. Taking into account the motive for starting an entrepreneurial enterprise, we distinguish two basic types of entrepreneur "necessity and opportunity". Support for this concept has been provided by numerous entrepreneurship researchers (Gurtoo and Williams, 2009, Hessels et al., 2008). The significance and role of this concept has been recognized by the Global Entrepreneurship Monitor (GEM). The survey results from the field of entrepreneurship and the chance of entrepreneurship have been included in the final reports of "GEMs" since 2002. Thus, entrepreneurs are considered opportunists to start entrepreneurship because of the profitable exploitation of the perceived chances, while the necessary entrepreneurs are ebbing with people who run the enterprise because of the lack of alternatives. These innovative entrepreneurs, supported by human capital and their competences, which tend to grow and develop entrepreneurship, require the engagement of additional human capital, as evidenced by Reynolds et al. (2002), which states that, unlike the necessary entrepreneurial endeavors, it is precisely the opportunistic intent those who expect to create twenty new jobs in the next five years of business. While it is possible for a necessity-based entrepreneurship to turn into high-growth ventures (Shane 2009), however, the higher percentage of opportunity-based entrepreneurial ventures is associated with higher growth expectations (Lecuna et al., 2017). Based on the previously presented views, the authors of the paper defined the following hypothesis:

H2: Opportunity based motivation is positively related to the growth expectations of entrepreneurs in South East Europe region.

Entrepreneurs as holders of the entrepreneurial process based on recognition and profitable exploitation of identified opportunities, often find opportunities for their venture growth beyond the borders of their country. Along with the strengthening of the world economy globalization process, an interest in the internationalization of entrepreneurial ventures is noticed in the last decade (Časas & Dambrauskaite, 2011). Internationalization has become one of the most important factors, which determines the long-term competitiveness of the enterprise (Sekliuckiene et al., 2016). Most likely, the source for growth, entrepreneurs recognize in an accession of new, foreign markets, even though it is a risky process due to a different political and social environment (Shrader et al., 2000). According to the research of Verheul and Van Mil (2011) internationalization is positively associated with growth aspiration.

H3: Internationalization of business venture is positively related to the growth expectations of entrepreneurs in South East Europe region.

METHODOLOGY

The main source of the data of analysed factors (variables) in this study is the GEM research results (Global Entrepreneurship Monitor) in 2013. GEM represents the world's leading research consortium dedicated to understanding the relationship and impact of entrepreneurship on national economic development. A research study conducted in 2013, included 70 countries and 198,000 respondents, which represents the most relevant database when it comes to the academic discipline entrepreneurship. We were interested in understanding growth orientations of entrepreneurs in South East Europe region. For the purposes of this research, the authors included six countries in research sample of South East Europe: Slovenia, Croatia, Hungary, Romania, Bosnia and Herzegovina, and FYR of Macedonia. An exploratory sample of the mentioned countries was 12027 respondents, which is presented in Table 1. The total number of high-growth entrepreneurs within this sample was 632.

Table 1. Research sample

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Hungary	2000	16,6	16,6	16,6
	Romania	2021	16,8	16,8	33,4
	Croatia	2000	16,6	16,6	50,1
	Slovenia	2002	16,6	16,6	66,7
	Bosnia and Herzegovina	2004	16,7	16,7	83,4
	Macedonia	2000	16,6	16,6	100,0
	Total	12027	100,0	100,0	

Source: Global Entrepreneurship Monitor database 2013

GEM represents one of two available international comparative data sets related to entrepreneurship (Estrin *et al.*, 2013). Another one is World Bank "Entrepreneurship Survey" focused on registered companies while GEM captures all entrepreneurial activity at the national level (Acs *et al.* 2008). The authors decided to use global individual national level data from 2013, because GEM research methodology, from the aspect of conceptuality and comprehensiveness, leads to the results of a research that does not lose significance with the flow of time in this intensity.

Dependent variable

According to Baum *et al.* (2001) growth can be considered as a crucial indicator of venture success. Observing Global Entrepreneurship Monitor methodology, growth is related to number of employees. In accordance with previous research (Tominc and Rebernik, 2007), authors chose *expected number of jobs* as a dependent variable which symbolizes entrepreneurial growth expectation which was measured by following scale: (1) no job, (2) 1-5 jobs, (3) 6-19 jobs, (4) 20+ jobs.

Independent variables

Based on previous research conducted by Lecuna *et al.* (2017), the authors of this paper decided to include several variables for entrepreneurial knowledge, skills and abilities. These are the following variables: 1.) "*In the next six months, will there be good opportunities for starting a business in the area where you live?*" which represents *alertness*. 2.) *Do you have the knowledge, skill and experience required to start a new business?* – which represents *self-efficacy*. 3.) *Do you know someone personally who started a business in the past 2 years?* – which represents *networking*. 4.) *Would fear of failure would prevent you from starting a business?* – which represents *risk tolerance*. Based on a previous study of Arroyo *et al.* (2016) internationalization has been identified with *export intensity* which was measured by following scale: (1) more than 75% (2) 25%-75% (3) less than 25% and (4) none. For the purpose of this research, we recoded the variable which represents entrepreneurial motivation. Next question was used to identify entrepreneurial motivation: "*Are you involved in this startup to take advantage of a business opportunity or because you have no better choices for work?*". Available answers were: (1) take advantage of business opportunity; (2) no better choices for work; (3) combination of both of the above; and (4) have a job but seek better opportunities. Questions 2 and 3 were recoded with the value 1, so it can represent necessity-motive. Question 1 and 4 were recoded with value 0 in order to represent opportunity-based motivation.

Control variables

Based on previous research by Širec and Tominc (2017), the authors included following control variables: *age*, *gender* and *household size* which represents number of household members.

RESULTS OF ANALYSIS

Table 2 presents Spearman's correlation test results. It can be seen that there are statistically significant correlations between the expected number of jobs and hypothesized predictors such

as alertness ($r = -0.101$), self-efficacy ($r = -0.072$), motivation ($r = -0.147$), gender ($r = -0.203$), age ($r = 0.129$) and household size ($r = 0.134$). This test showed weak statistically significant correlations between these variables.

Table 2. Correlations among study variables

		1	2	3	4	5	6	7	8	9	10
Networking	Pearson	1									
Alertness	Pearson	,163**	1								
Self-efficacy	Pearson	,259**	,118**	1							
Risk tolerance	Pearson	-,054**	-,110**	-,104**	1						
Motivation	Pearson	-,093**	-,117**	-,056	,081*	1					
Internationalization	Pearson	-,007	-,026	-,136**	,004	,131**	1				
Gender	Pearson	-,110**	-,061**	-,196**	,095**	,081*	,057	1			
Age	Pearson	-,095**	-,069**	-,022*	,013	,109**	,067*	,009	1		
Household	Pearson	,017	,046**	,032**	-,009	,152**	,007	-,029**	-,208**	1	
Growth	Pearson	,053	,101**	,072*	-,070	-,147**	-,203**	,129**	-,053	,134	1

Source: Author's calculation

In order to explore which predictor variables have a positive relationship with the level of an expected number of jobs, the authors performed the ordinal logistic regression (OLR). The first part of the analysis obtained the exploration of the Model Fitting Information, which gives the -2 log likelihood for the intercept-only and final models. Final model describes the model that includes the specified predictor variables (KSA's, motivation, and internationalization) whose coefficient has been estimated using an iterative process that maximizes the log likelihood of the outcome. It is obvious that the model is statically significant (-2 log likelihood=1462,136; Chi Square=57,660; $p=0.000$). The next step was to explore whether the obtained data fit the model. Both of the goodness-of-fit statistics, Pearson and Deviance goodness-of-fit measures are used for proposed models. The results of our analysis suggest the model does fit well. The test of parallel lines showed that the model fits the data well (2 Log Likelihood=1441,050; Chi-Square=21,086) since the p-value is 0.515 for the model. For ordinal regression models, it is not possible to compute the R^2 statistic, so there were tested three approximations: Cox and Snell, Nagelkerke, and McFadden. The pseudo R^2 values (Nagelkerke=9,6%) indicates that predictors explain a relatively small proportion of the variation between the levels of expected jobs in the next five years from the selected countries of the SEE region.

Table 3 presents parameters estimates of the results. Regression model showed that there is a statistically significant positive relation of some of the elements of KSA's, opportunity based motivation and internationalization with *the level of expected jobs in a forthcoming 5-year period*. According to the table 3, we calculated the exponent value for each estimation coefficient to get the odds ratio. After this procedure, we found that there is a significant positive coefficient for *know someone personally who started a business in the past 2 years - networking*, odds of entrepreneurs with this positive perception to reach higher level of growth expectations are 1,23 times greater than those with negative perception, given that the other variables in the model are held constant. In case of "In the next six months, will there be good opportunities for starting a business in the area where you live" - *alertness*, odds of examinees with this positive perception to reach a higher level of growth, expectations are 1,17 times greater than those with negative perception, given that the other variables in the model are held constant. . In case of **motivation**, odds of examinees with opportunity motives to reach a higher level of growth expectations are 1,65 times greater than those driven by necessity motive, given that the other variables in the model are held constant. In case of **internationalization** of venture in its early stages, odds of examinees with export intensity of 24% and less, to reach a higher level of growth expectations are 1,59 times greater than entrepreneurs with no export activities, given that the other variables

in the model are held constant. Examinees with export intensity between 25% and 75%, to reach a higher level of growth expectations are 2,25 times greater than entrepreneurs with no export activities. Similar result was found in term of examinees with export activities greater than 75%, expectations of these entrepreneurs to reach higher level of growth expectations are 2,17 times greater than entrepreneurs with no export activities.

Table 3. Parameter estimates for ordinal logistic regression

		Estimate	<u>Exp (B)</u>	Std. Error	Wald	df	Sig.
Threshold	[TEAyyJ5Y = 1]	-1,131		,428	6,997	1	,008
	[TEAyyJ5Y = 2]	1,674		,424	15,569	1	,000
	[TEAyyJ5Y = 3]	3,095		,437	50,146	1	,000
	age	-,004	1,040811	,007	,295	1	,587
	hhszise	,191	1,2104594	,048	15,515	1	,000
	[knowent=0]	,212	1,236148	,158	,150	1	,014
	[knowent=1]	0 ^a		.	.	0	.
	[opport=0]	,165	1,179393	,160	1,069	1	,006
	[opport=1]	0 ^a		.	.	0	.
	[suskill=0]	-,176	0,838618	,228	,593	1	,441
	[suskill=1]	0 ^a		.	.	0	.
Location	[fearfail=0]	,093	1,097462	,165	,316	1	,574
	[fearfail=1]	0 ^a		.	.	0	.
	[Opp_Nec=,00]	,506	1,658643	,164	9,502	1	,002
	[Opp_Nec=1,00]	0 ^a		.	.	0	.
	[gender=1]	,279	1,321807	,161	2,998	1	,083
	[gender=2]	0 ^a		.	.	0	.
	[TEAEXP4C=1]	,777	2,174938	,277	7,898	1	,005
[TEAEXP4C=2]	,812	2,252408	,228	12,695	1	,000	
[TEAEXP4C=3]	,464	1,590423	,184	6,365	1	,012	
	[TEAEXP4C=4]	0 ^a		.	.	0	.

Source: Author's calculation

5. DISCUSSION AND CONCLUSION

The paper is exploring a particular gap and it can advance the understanding of the importance of determinants of entrepreneurial growth intentions. Although the theory recognizes relationships of variables used in this research, yet there is a significant unexplored area, especially in terms of SEE region. The findings of this research have important theoretical implications. The main theoretical implication lies in the expansion and closer connections of entrepreneurial KSA's, motivation and internationalization as a determinants of entrepreneurial growth intentions. We found positive correlation and influences of alertness, self-efficacy, motivation, internationalization and gender on entrepreneurial growth intentions, measured by

entrepreneurial perception of future number of employees in the next five years period. Also, the most of the previous studies on this theme were theoretical. This study used empirical data to explore the relations between dependent and independent variables and proved some of these relations.

We have partially proved our first hypothesis (H1) related to positive relationship between entrepreneurial KSA's and entrepreneurial growth intentions. Education and entrepreneurial trainee programmes have significant influence on entrepreneurial KSA's. Therefore, it should be orientation of countries in SEE region to give more support to knowledge and skills improvement beside high amount of assets spent in entrepreneurship specific programming. Also, we proved our second hypothesis (H2) related to entrepreneurial (opportunity-based) motivation and entrepreneurial growth intentions. Results of analysis are in accordance with majority of research papers based on GEM data. Opportunity-based entrepreneurs are aiming unexploited chances in business environment, therefore, we can expect growth in their entrepreneurial ventures. Necessity-based entrepreneurs do not intend to start a high-growth venture, therefore there is a little chance to expand their number of employees in a future period of five years. We proved our third hypothesis (H3) related to positive relationship between internationalization and entrepreneurial growth expectations. Internationalization is seen as a potential strategic response to the aspiration-performance gap because it represents a growth alternative (Acs and Terjesen 2013). Growing internationally can open size of the potential market and also it can influence entrepreneurial venture in growth of number of employees in order to satisfy consumer demands.

Our research has few limitations. First, we reached low Nagelkerke coefficient (9,6%) which indicates that predictors explain a relatively small proportion of the variation, but p values in our model still indicate a real relationship between the significant predictors and the response variable. Second, authors have decided to use available data from GEM study for 2013, which implies that this is a single year data. This limitation can lead to future research which will observe changes in entrepreneurial activity in a period of several years. This research can be based on time series data.

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CROWDFUNDING AS A BASIS FOR LAUNCHING NEW BUSINESS VENTURES

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Abstract: *Over the last ten years the crowdfunding concept expanded rapidly and became one of the most attractive methods of financing new business ventures. Crowdfunding is a method of securing funds for the realization of an entrepreneurial venture by collecting small investment funds from a large number of investors over the Internet, without using standard financial intermediaries. Crowdfunding uses web technologies and existing online payment systems to facilitate transactions between founders (people who require funds) and funders (people who give money). Its relevance and popularity are still growing thanks to the development of ITC technologies and new ways of thinking about business ventures. Start-ups as well as small and medium-sized enterprises see crowdfunding as an important instrument of raising capital which benefits from undisturbed financial assets of the Internet users. Crowdfunding implies mobilizing the crowd to finance projects which are posted on dedicated websites, known as crowdfunding platforms. Therefore, more and more investors are noticing the evident advantages offered by this kind of financial instrument. Crowdfunding is changing the way entrepreneurs finance their effort, launching new products and services on the market and how they create start-ups. Crowdfunding's social impact appears to be unchallenged when it comes to start-ups, and it also seems to be a key factor in contributing to the increase of their number and social and economic success. The objective of this paper is to improve our understanding of crowdfunding concept and discuss its characteristics, related terminologies, and key elements, as well as the possibilities of financing innovative ideas in Serbia. The paper expounds basic activities in the realization of this concept, such as creating a presentation of the call, getting to know the online community, collecting roles, developing innovations and distributing the revenue. Also, the paper highlights the crowdfunding models. These are donation based, reward based, equity based and interest based crowdfunding.*

Keywords: *Crowdfunding, Venturing, Entrepreneurship*

JEL Classification: *L26, O31, G18*

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INTRODUCTION

The crowd can invest in business ideas and projects that are initiated by entrepreneurs in the crowd who do not have the traditional monetary resources, such as banks and investment agencies, to implement their ideas. These entrepreneurs can pledge for financial resources from the crowd in various open social communities. This emerging approach of raising money via the Internet is called *crowdfunding*. Crowdfunding, as a novel method for funding a variety of new ventures, allows founder of different projects to fund their efforts by drawing on relatively small contributions from a relatively large number of individuals using the internet, without standard financial intermediaries, via websites such as Kickstarter (www.kickstarter.com) and IndieGoGo (www.indiegogo.com). Through these sites, businesses or individuals who need financing for a project/venture publish an appeal for funds to those who make contributions. Because small amounts of money from a large number of people can add up quickly, these sites have experienced tremendous success (Stemler, 2013).

Crowdfunding is uniquely positioned to assist two groups of people in securing the money and support they need: (1) entrepreneurs trying to turn their ideas into viable businesses, and (2) small business owners trying to keep their businesses afloat or get them to grow. Both face enormous challenges in today's financial environment. Due to their lack of credit, operating history, and proven track record, fledgling companies often have a hard time pursuing financing through traditional avenues, such as bank loans (Fink, 2012).

Belleflamme et al. summarize *three characteristics of crowdfunding*. *First*, crowdfunding initiatives often rely on the pre-order of products that are not yet available on the market. Entrepreneurs who start crowdfunding projects describe what the final products are and offer a list of monetary or nonmonetary rewards for sponsors who are willing to invest. *Second*, consumers or sponsors pay more in the pre-ordering process than traditional consumers do, who wait to buy the final product on the market. *Third*, sponsors identify themselves as members involved in the production process, which ranges from the initial donation of money to direct involvement in the entire project. The third characteristic is considered one major benefit of crowdfunding over traditional funding approaches because crowdfunding can involve consumers or sponsors and thereby enhances their experiences in the complete production process.

CROWDFUNDING PARTICIPANTS

The role of actors of the crowdfunding scheme is important to understanding how does the crowdfunding work. The participants contribute to the crowdfunding in diverse ways by creating a balanced environment that determines process functions and practices. What follows is a short review of major participants in the crowdfunding ecosystem, with attention to what each of them brings to the system and what are their expectations. The main participants are: website providers, founders and backers.

The website providers create and manage the process from the technical point of view and ensure that it's operating properly for the founders and backers. Website providers connect all the stakeholders and represent the hub of the ecosystem. Crowdfunding at its core is enabled by technology; therefore, website providers play a crucial and central role in the crowdfunding phenomenon. They provide the technology backbone that allows founders to expose their project to a large number of potential backers. Providers perform another role within the project: they facilitate communication between the founder and backers (both potential and actual) by using features such as a comment section, project update capabilities, and email exchanges. Additionally, the providers have to ensure that the payment functions are secure and reliable, in order for backers to be able to actually contribute financially to the project. Thus, website

providers may act as intermediaries, orchestrators, rule enforcers, and distribution channels (Ordanini, Miceli, Pizzetti, & Parasuraman, 2011).

It is possible to use the term “founder” to represent those individuals who post their idea on a crowdfunding website to receive funding. Individuals seeking funding come from a wide variety of backgrounds and have a wide range of goals (Mollick, 2014). Many definitions are present in the literature, such as “creator”, “borrower”, “entrepreneur”, “firm”, “founder”, “owner”, and “start-up”. However, many of these labels are restrictive and leave out some of the actors. For example, some people who ask for funding are not necessarily entrepreneurs or have a goal of starting a business. As a suitable definition, we propose the term “founder”, being “a person who founds or establishes” (“Founder”, n.d.) to refer to initiators of communities, charitable organizations, and businesses. This term is rendered credible by its current use in the literature.

The crowdfunding was established because of the founders’ unfulfilled need for capital. To achieve this objective, the founders create a concept product or a project and then seek to compel the potential backers to invest, by creating an eye-catching website. During the campaign, founders control access to information by being accessible and transparent. In addition to raising capital, founders may use crowdfunding to gain exposure for future funding (Dingman, 2013), to test market an idea (Helmer, 2014), to gain validation (Gerber, Hui, & Kuo, 2012), and to build relationships by fostering open communication and collaboration with backers (Gerber et al., 2012).

Equally important to the crowdfunding ecosystem are the backers of crowdfunded projects. The role of the backer goes beyond just contributing money: they also play a role in testing the market and providing judgment toward what is a good idea and whether a concept is worth pursuing. Backers can contribute monetarily and/or through the use of social media and their own personal networks by spreading the word about a project. Because their role extends beyond a purely monetary one, we use the broader term, “backer”, in favor of other terms such as “consumer”, “contributor”, “crowdfunder”, “funder”, “investors”, and “lender”, all of which are currently in use in the literature.

There are many theories what lies behind the backer's reasons for contributing to a crowdfunding campaign. For example, warm glow giving (Andreoni, 1990); that is, the positive feeling one gets from helping someone else, and there is evidence that in some crowdfunding contexts altruism does exist (Burtch, Ghose, & Wattal, 2013). On the other hand, some reasons may be egotistical - backers participate because they desire to participate (Gerber et al., 2012) or to gain social benefits from advertizing their participations.

STEPS IN THE CROWDFUNDING CAMPAIGN PROCESS

Crowdfunding is typically carried out through a crowdfunding website, many of which have emerged over the last several years. The founder posts a description of their idea or project on such a website to expose their idea to potential backers. Individuals discover projects through avenues such as social media or by browsing a crowdfunding website. If the individual believes in the idea and would like to help make the project possible, the individual can back the project by contributing money via the crowdfunding website. Typically, the amount given by a backer is small relative to the overall funding needs. The idea behind crowdfunding is that, if many individuals donate a small amount, large sums of money can be raised quickly and efficiently. In addition to contributing financially, individuals can also help a project by spreading awareness through social media about projects they support, which builds up a crowd of interested parties willing to invest (Beaulieu et al, 2015). Having said that, the process of completing a crowdfunding campaign can be represented within four basic steps, which are explained ahead.

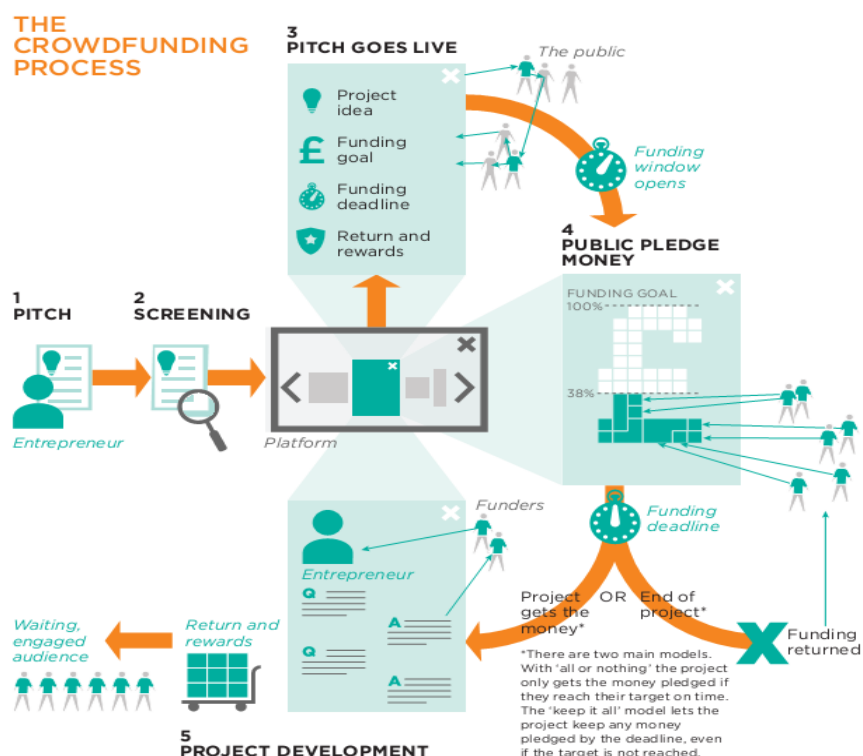


Figure 1 - Crowdfunding campaign process

Source: Authors

The first phase is to convince the investor (pitch the idea), where the founder has to prepare the presentation for their idea. Afterwards, there is the verification (screening), i.e. analysis of the idea which is carried out to check its feasibility. The last step is to publish the idea. Therefore, the platform (website) displays the idea, the investment goals, deadlines, and the gains for the investors. The next step is the public fundraising, i.e. by the deadline, the investors send their funds by using the platform. Each platform always shows the current status of the fundraising. After the deadline for fundraising, it is possible to apply two models: “All or nothing” or „Keep it all“, which are shown on the Figure 1. The last step should be the successful completion of the project. The distribution of gains is mostly agreed upon with potential investors. At this point, the attention should be paid to the potential risk which involves investments. In the event that the planned goals do not get reached, nobody, and that includes investors, will not achieve any profit.

CROWDFUNDING PLATFORMS

In addition to encompassing a wide range of potential projects, and founding goals, crowdfunding also differs from other methods of start-up funding because the relationship between funders and founders varies by context and nature of the funding effort (Belleflamme et al., 2012). There are four main contexts in which individuals fund projects, but these contexts that often overlap as projects may allow funders to achieve several different goals simultaneously (Mollick, 2014). It is useful to distinguish between two broad classes of CFPs, (i) investment-based CFPs and (ii) reward and donation-based CFPs. The first class includes equity-based, royalty-based, and lending-based CFPs, where funders are investors in a campaign and may obtain monetary benefits. In the second class, funders cannot expect a monetary compensation; they fund a campaign because they obtain a product or because they support its cause (or a combination of the two) (Belleflamme, Omrani, Peitz, 2015).

In the first model, *equity-, royalty-, and lending-based CFPs*, funders act as investors or lenders. They have to assess the risk of the investment; i.e., the expected performance of a successful

campaign. The uncertainty from the viewpoint of the funder is whether the project will lead to a product that caters to the tastes of a sufficiently large number of potential customers. On equity-based CFPs, fundraisers offer equity stakes for the funding of a campaign, while, on royalty-based CFPs, a fraction of revenues or profit is offered. Fundraiser typically specifies a target that has to be reached. This “All-or-nothing“ approach means that if a project does not reach its target then it does not receive any of the money that has been pledged. This is seen as a way of protecting funders and encourages projects to set realistic funding targets that match the amount of money they need in order to realize their project's aim.

The second model, the *lending-based CFPs*, is the one in which the funds are offered as a loan, with the expectations of some rate of return on capital invested. In the case of microfinanced loans, the lender may be more interested in the social good promoted by the venture than any return generated by the loan.

The third approach, commonly called *reward-based crowdfunding*, is the most widespread crowdfunding model. In most cases, the reward is the product that is eventually produced by the entrepreneur with the money raised during the campaign. In practice, two types of platforms have emerged: "All-Or-Nothing" (AON), and "Keep-It-All" (KIA). The “Keep-It-All” (KIA) model involves the entrepreneurial firm setting a fundraising goal and keeping the entire amount raised, regardless of whether or not they meet their goal, thereby allocating the risk to the crowd when an underfunded project goes ahead. The “All-Or-Nothing” (AON) model involves the entrepreneurial firm setting a fundraising goal and keeping nothing unless the goal is achieved, thereby shifting the risk to the entrepreneur. We show that small, scalable projects are more likely to be funded through the KIA scheme, while large non-scalable projects are more likely to be funded through the AON scheme. Overall, KIA campaigns are less successful in meeting their fundraising goals, consistent with a risk-return tradeoff for entrepreneurs, where opting for the KIA scheme represents less risk and less return for the entrepreneur (Cumming, Leboeuf, Schwienbacher, 2015).

Alternately, reward-based crowdfunding treats funders as early customers, allowing them access to the product produced by funded projects at an earlier date, better price, or some other special benefit. The “pre-selling” of products to early customers is a common feature of those crowdfunding projects that more traditionally resemble entrepreneurial ventures, such as projects producing novel software, hardware, or consumer products (Mollick, 2014). Kickstarter and Indiegogo are reward-based crowdfunding platforms whereby entrepreneurs state capital raising goals, and, in exchange, individuals are offered a reward for participating.

Some crowdfunding efforts, such as art or humanitarian projects, follow a *donation-based CFPs*, placing funders in the position of philanthropists, who expect no direct return for their donations.

The entrepreneurs and innovators from Serbia can use the platforms abroad, in the countries whose laws allow foreigners to participate. There is no Serbian platform for a mass investment because there is no legal framework, which is necessary to avoid different possibilities of fraud, as well as to limit greater amounts with the aim of limiting the damages if the investment endeavour fails.

CONCLUSION

Crowdfunding represents a novel way for founders to raise capital for a wide variety of projects. The concept and use of crowdfunding is evolving and it is being used in increasingly creative ways. Crowdfunding's core elements, however, focus on technology, capital funding, and the power of the crowd, which enables many small efforts to amass into a significant financial outcome. The crowdfunding process relies heavily on technology, both in terms of the websites

where it takes place and the technologies that provide social media connections that spread awareness about a project.

Crowdfunding represents a potentially disruptive change in the way that new ventures are funded. Additional research is required to catch up with practice and policy, both of which are embracing crowdfunding. This paper represents initial evidence about what promises to be an important and fruitful phenomenon in the study of new ventures.

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OWNERSHIP CONCENTRATION IMPACT ON FINANCIAL PERFORMANCE: EVIDENCE FROM SERBIA

Nikola Vasilic¹

Abstract: *Separation of ownership and management function in modern corporations resulted in the emergence of a conflict between principal (shareholders) and agent (top management). According to agency theory ownership concentration is a key mechanism that helps to mitigate principal-agent problem. As a result of the underdevelopment of the legal system and the corporate control market in transition economies and developing countries, the application of ownership concentration mechanism can lead to the emergence of a new conflict on the relationship between majority and minority shareholders. High ownership concentration allows the majority owner to use corporate resources in accordance with private goals, which negatively affects the value for minority shareholders and corporate performance. Accordingly, this research deals with the analysis of concentrated ownership impact on financial performance, measured by the Return on Asset (ROA) and Return on Equity (ROE). Empirical research was conducted for the period 2015-2017 on the sample of 70 non-financial companies, which shares are traded on the Belgrade Stock Exchange. The results of the applied statistical analysis methods show that ownership concentration greater than 55% has a negative impact on ROA and ROE.*

Key words: *Corporate Governance, Ownership Concentration, Agency Problem, Financial Performance, Transition Economies.*

JEL Classification: *G32, G34.*

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INTRODUCTION

Corporate governance can be defined as a set of clearly defined rules and procedures that regulate relationships between different stakeholders in and outside of the company, with the aim of creating adequate conditions for the proper function of a company and improving business performance. Corporate governance systematically regulates relationships between shareholders (principal) and management (agent) of the company, as well as between management, employees and all other internal and external stakeholders (Jensen & Meckling, 1976). This way, shareholders have the ability to carry out monitoring and controlling the management, which is the holder of the management function. A major contribution to the development of corporate governance has been given by the agency theory, which starts from the principal-agent problem, the cause of which is the separation of the management and ownership function. In order to alleviate the agency problem, different corporate governance mechanisms are applied (Babić, 2006). The effectiveness of corporate governance mechanisms are determined by two important factors. Firstly, the existence and implementation of laws and by-laws in the country that protect the ownership rights of shareholders. Secondly, the ownership structure, primarily the degree of ownership concentration as a percentage of shares held by majority shareholders. The agency problem is expressed in transition economies and developing countries, which are characterized by the underdevelopment of regulatory mechanisms of regulation, which further encourages managers to behave opportunistically. For this reason, it is resorted to a high ownership concentration, which is an internal, alternative mechanism for the regulation of managerial operations and the protection of shareholders' rights (La Porta, Lopez-de-slanes, Shleifer & Vishny, 1999).

The active role of the majority shareholders, which is manifested in the intensive supervision of top management activities, will reduce the ability of managerial manipulation of free cash flows, with most of the funds being channeled towards profitable projects. This improves the company's position on the market, which will reflect on the increase in shareholder value and the improvement of corporate performance.

A large number of empirical research about the effects of ownership concentration on financial performance show mixed results and conclusions about this corporate governance mechanism, which may be the result of different development phases in which the surveyed countries are located, as well as the applied model of corporate governance. Significant differences are present between developed European countries (EU) and transitional economies, which also include the Republic of Serbia.

The aim of this research is to examine the effects of ownership concentration on financial performance of the selected companies. Empirical research was conducted on the basis of data collected for the period 2015-2017. The sample for which this survey was conducted consists of 70 companies from the non-financial sector. Statistical data analysis was performed using descriptive statistics, correlation coefficient between independent and dependent variables, and multiple OLS regression analysis to determine the impact of independent variable on the dependent. Statistical data processing was performed using SPSS v.20 and MS Excel.

The results confirm that high ownership concentration has a negative influence on minority shareholders position and reduces efficiency of using corporate resources, which has negative impact on financial performance. The contribution of this paper is reflected in the expansion of existing knowledge in the field of corporate governance, because empirical research has confirmed previously defined research hypotheses. Relevant entities may use the presented facts in order to verify the legislation functionality in domain of protection minority shareholders rights. Another practical implication is raising awareness among minority shareholders about the potential misuse of funds by majority shareholders and the need to create appropriate

mechanisms through which minority shareholders will be involved in the decision-making process and monitoring top management behavior.

This research paper consists of three parts. The first part deals with the review of literature in the field of corporate governance, with a special emphasis on presenting existing theoretical knowledge about the effects of ownership concentration on financial performance. There is also a summary of the results of a current empirical studies in this area in developed and transition economies. The second part presents the methodology of measuring independent and dependent variables that are the subject of research in this paper. The third part of the paper contains the results of the correlation and regression analysis, based on which the relevant conclusions related to the tested research hypotheses were made.

LITERATURE REVIEW

Unlike traditional companies, where ownership and management functions have been consolidated, modern corporations have broken down. Holders of ownership function are shareholders/owners, while corporate governance is governed by professional managers (Hindley, 1969). Owners do not decide on how to use corporate resources over which they have proprietary rights. They just take the profit in form of dividends. On the other side, top management is responsible for making decisions about how to allocate corporate resources. Decisions made by managers should be in favour of satisfying the owners' interests, although this is often not the case. For this reason, there is a potential conflicts of interest between shareholders/principal and managers/agent, which explaine by the agency theory. The agency theory sees the common cause of the conflict on the principal-agent relationship in their divergent interests (Babić, 2006). What is in the owner's best interest is the maximization of profit, that is, the appropriation of the largest part of the free cash flow through dividends (Jensen & Ruback, 1983). Managers, however, seek to exploit the position they are in, so as to direct corporate resources towards the pursuit of private interests (Jensen & Meckling, 1976). In order to mitigate this problem, effective monitoring and control of the agents is necessary, which causes additional agency costs for the owners (Ross, Westerfield & Jaffe, 2002).

Problems of effective monitoring of management effort appear as a consequence of moral hazard (Eisenhardt, 1989; Babić, 2006). Moral hazard can be explained as a lack of interest and effort by managers, because managers know that they will not fully bear the consequences of their actions (Babić, 2010). Also, the problem arises when managers act more competitive than they really are. Candidates for management position can claim to have certain skills and abilities to perform a job, although they do not actually have them. The previous problems result in inefficient internal control mechanisms and a low level of management motivation, which, with inefficient external control mechanisms, produces high agency costs and reduces corporate performance and potential value, which is shared by shareholders through the dividend (Todorović, 2010).

Considering that the ownership structure of modern corporations consists of a large number of shareholders, the question arises as to which is the best and most effective mechanism for supervision and control of managers. The agency theory points out that a high degree of ownership concentration will contribute to the reduction of managerial opportunism, which will in the end have positive effects on the overall corporate performance. The gist is that a small number of major shareholders or one of the largest shareholders, in addition to appropriating profits, has been granted the right to participate in decision-making process and control of management behaviour. Large shareholders, unlike small ones, are more interested in monitoring and control managers activities. This is due to the fact that their shares in the share capital, and therefore the risk of efficient use of corporate resources, are significantly higher than shares and risk of minority shareholders. In addition, the major shareholder has full control over the work

of the Board of Directors (Babić & Nikolić, 2011). In this way, by intensive monitoring and control of the work of managers, large shareholders reduce the ability of managerial manipulation of free cash flows, which makes most of the funds available to profitable projects, which contributes to improving corporate performance and paying out larger dividends to shareholders.

Mitigate principal-agent conflict, using the ownership concentration mechanism, does not necessarily lead to improved corporate performance. The reason for this is that as a result of the elimination or control principal-agent conflict due to the increased concentration of ownership, a new problem arises on the relation principal-principal (Babić & Nikolić, 2011). The conflicting participants are the majority shareholders, who are in the role of business and management controllers, and minority shareholders, who are in an inferior position (Su, Xu & Phan, 2008). Principal-principal conflict is present in transitional economies and developing countries, characterized in general by the underdeveloped legal system, especially in the domain of the shareholders' rights protection. Thus, their rights become subject to expropriation, which is manifested in the form of control over the company by majority shareholders, whereby all forms of company resources is in their manipulative space, and disabling minority shareholders to collect returns from their share (Dharwadkar, George & Brandes, 2000).

A large number of empirical research on the effects of ownership concentration on financial performance show contradictory results and conclusions about this corporate governance mechanism. Divergent results in this field may be the result of the different development stages in which the surveyed countries are located, as well as the applied model of corporate governance. Significant differences are present between developed European countries (EU) and transitional economies, which also include the Republic of Serbia.

Developed European countries apply a continental model of corporate governance which are characterized by the presence of a small number of major shareholders in their companies, an insufficiently developed corporate control and foreign ownership markets (Ooghe & Langhe, 2002). The ownership structure of the company is made up of a small number of major shareholders who take over the role of controllers over the activities of management. The concentration of ownership in these countries prevents the emergence principal-agent problem, but the increase in ownership concentration above a certain level can lead to the emergence of the aforementioned problem in relation to majority-minority shareholders (Babić & Nikolić, 2011). It is therefore important to improve the efficiency of legal regulations and to stimulate the development of capital markets. Hamdouni (2010) was examined the effects of concentrated ownership on financial performance over a sample of 106 companies in France. High concentration of ownership has a negative effects on ROA, and positive effects on ROE. The results of the survey carried out by Alimehmeti & Paletta (2012) over listed companies in Italy confirm the positive implications of ownership concentration on ROA. The effects of concentrated ownership on financial performance measured by ROA and ROE in the Netherlands show the existence of a positive correlation (Scholten, 2014; Boerkamp, 2016). In a research conducted by Arosa, Iturralde & Maseda (2007) for over 586 unlisted companies in Spain, there are positive effects of ownership concentration on financial performance. In the same country, the research conducted by Cabeza & Gomez (2011) confirms the positive effects. Kapopoulos & Lazaretou (2006), by researching over 175 listed companies in Greece, confirms the positive impact of concentration of ownership on financial performance. The results of conducted empirical studies show that ownership concentration has a positive effects on financial performance of companies in the EU developed countries.

In addition to the developed economies, the issue of concentration of ownership is particularly significant in transition economies, where the process of transformation of state and social into

private ownership has led to significant changes in the ownership structure. The applied privatization methods differed from country to country, but mainly resulted in a concentration of ownership. Transition economies have implemented the reform process without a predefined plan, expecting that any change in ownership structure, leading to increased private ownership, will have a positive effect on corporate performance (Foo & Dorota, 2011). In addition to this underdeveloped legal system, which should be the basis for the implementation of structural changes, it further reduced the effects of privatization that did not have a strategic character. High level of corruption and excessive bureaucracy, as well as the fact that countries in transition were at an exceptionally low level of development compared to developed European economies, are additional arguments that can justify the weak or negative effects of concentration of ownership. The capital and labor markets, due to underdevelopment, could not be used as an effective mechanisms for disciplining and controlling the efficiency of management. For transition economies, a unified model of corporate governance has not yet been adopted, and the application of the continental or Anglo-Saxon model in their original form is not possible. Numerous authors agree that for the needs of transition economies it is necessary to develop a special hybrid model composed of an adequate combination of components, which are immanent for Continental and Anglo-American model of corporate governance in accordance with the socio-economic and historical specificities of transition countries (Błaszczyk, Hashi, Radygin & Woodward, 2003; Babić & Nikolić, 2016).

The results of the research carried out in transition economies are mixed. Mueller, Dietl & Peev (2004) were examined the effects of ownership concentration on ROA of 518 non-financial companies during the transitional period in Bulgaria. The results show that high concentration of ownership has a negative impact on ROA. The negative effects of ownership concentration on company performance are also found in the research of Lskavyan & Spatareanu (2006) carried out in Poland and the Czech Republic during the transitional period. Stančić, Čupić & Obradović (2014) analyzed the effects of ownership concentration on the profitability of the 74 commercial banks in Serbia, Macedonia, Bosnia and Herzegovina, and Croatia. The results show that the increase in the concentration of ownership has a negative, but a weak effect on the banks profitability. Pervan, Pervan & Todoric (2012) conclude that the high ownership concentration has a negative effect on financial performance in Croatia in the period 2003-2010. Leković & Marić (2015) did not find a significant correlation between different levels of ownership concentration and financial performance on a sample of 228 companies in Serbia. Similarly, Nikolić, Babić & Erić (2013) report on the absence of significant differences in the impact of concentration of different ownership types on profitability of 146 companies in Serbia.

A research which was conducted in over 60 privatized companies in Macedonia shows that ROA (Abazi-Alili, 2013) increases with the increase in ownership concentration. In the paper Balsmeier & Czarnitzki (2010), the effects of concentrated ownership on financial performance in 29 transition economies for the period 2002-2009 were tested. The results show that there is a U-shaped relationship between ownership concentration and performance, which indicates that the increase in ownership concentration to a certain limit of 55% positively affects financial performance. When ownership concentration exceeds 55%, financial performance deteriorates.

Based on the above findings and mixed results of empirical studies, the following research hypotheses will be set:

H₁: High ownership concentration has a negative impact on ROA.

H₂: High ownership concentration has a negative impact on ROE.

METHODOLOGY

Sample and statistical methods

Empirical research was conducted on the database for 2015-2017. The sample for this research was conducted consists of 70 companies from the non-financial sector (Open market and MTP Belex). All data necessary for statistical analysis were collected from secondary sources. For the calculation of ROA and ROE, the data contained in the financial reports are available on the website of the Belgrade Stock Exchange. Data on percentage shares of shareholders are available on the Central Securities Register website.

Statistical analysis of collected data includes descriptive statistics, determination of the correlation coefficient between ownership concentration and financial performance, multiple OLS regression analysis to determine the impact of ownership concentration on financial performance. The entire statistical data processing was performed in the software *IBM SPSS v.20* and *MS Excel*.

Independent and dependent variables

The independent variable in this paper is ownership concentration. Degree of ownership concentration is measured as a percent of shares owned by largest shareholders, who own more than 55% of total shares:

$$55\% \leq \text{percent of shares owned by largest shareholder} \leq 100\%.$$

The financial performance of companies, as dependent variables, were measured using ROA and ROE.

ROA is a profitability ratio coefficient that shows the ability of a company to create profit by using its assets. ROA is determined as the ratio between net profit and total assets

$$\text{ROA} = \text{Net profit} / \text{Total assets}.$$

ROE is a profitability ratio coefficient that measures company's ability to earn profits by engaging capital. ROE is determined as the ratio between net profit and total equity.

$$\text{ROE} = \text{Net profit} / \text{Total equity}.$$

Control variables

Although the aim of this research is focused on examining the impact of ownership concentration on financial performance, it is necessary to extract the appropriate control variables, because financial performance, can be determined by other factors. For these reasons, the analysis includes two control variables: company's liquidity and activity. The company's activity is an important profitable factor and is defined as the ratio between sales revenue and total assets. Increasing the activities of the company, ie sales turnover, has a positive impact on financial performance. Liquidity of the company, as the ability to execute maturity obligations, also contributes to improving financial performance. Low liquidity makes it difficult to carry out daily business activities, which can negatively affect financial performance. Liquidity of the company is determined as the ratio between current assets and short-term liabilities.

$$\text{Liquidity} = \text{Current assets} / \text{Short-term liabilities}.$$

$$\text{Activity} = \text{Sales revenue} / \text{Total assets}.$$

RESULTS AND DISCUSSION

The arithmetic mean, standard deviation, minimum and maximum values are shown in Table 1. The average value for ROA is -.096674, and for ROE = -.006063. The lowest ROA is -2.7298, while the maximum value is 3.0467. The minimum ROE value is -2.0937, and the maximum is 3.9585. Ownership concentration in the observed sample ranges from 55.18% to 100%, while the average value of concentrated ownership is 77.89%.

Table 1. Descriptive statistics

Variables	N	M	SD	Min	Max
<i>Own_conc</i>	70	77.89%	.1176869	55.18%	100%
<i>Liquidity</i>	70	5.151507	8.0134189	0.1474	56.6473
<i>Activity</i>	70	1.529326	1.8393983	0.0000	7.8781
<i>ROA</i>	70	-.096674	.6883132	-2.7298	3.0467
<i>ROE</i>	70	-.006063	.6906100	-2.0937	3.9585

Source: Author's calculation

In order to test the research hypotheses, a correlation analysis was first performed, which results are shown in Table 2. There is a significant and negative correlation between ownership concentration and ROA, with the coefficient of correlation -0.322 (sig < 0.01). The statistically significant, negative and weak link is present between ownership concentration and ROE, because the coefficient of correlation is -0.276 (sig < 0.05).

Table 2. Correlation matrix

Variables	<i>Own_conc</i>	<i>Liquidity</i>	<i>Activity</i>	<i>ROA</i>	<i>ROE</i>
<i>Own_conc</i>	1.000	-.116	-.103	-.322**	-.276*
<i>Liquidity</i>	-.116	1.000	-.031	.173	.067
<i>Activity</i>	-.103	-.031	1.000	-.044	.090
<i>ROA</i>	-.322**	.173	-.044	1.000	.671**
<i>ROE</i>	-.276*	.067	.090	.671**	1.000

** p<0.01, * p<0.05.

Source: Author's calculation

Significant results obtained by correlation analysis are the basis for conducting deeper statistical analysis using multiple OLS regression. Concentrated ownership has a significant and negative impact on ROA (**B = -.315; sig = 0.008**). Liquidity has an insignificant and positive impact on ROA (B = .149; sig = .201). Activity has an insignificant and negative impact on ROA (B = -.061; sig = .601). The determination coefficient for this model is **R² = .130**, which implies that only 13% of the ROA variability is determined by changes in the ownership concentration. This model does not have a problem with multicollinearity (VIF < 10).

Concentrated ownership has a significant and negative impact on ROE (**B = -.267; sig = 0.027**). Liquidity has an insignificant and positive impact on ROE (B = .051; sig = .668). Activity has an insignificant and negative impact on ROE (B = .073; sig = .538). This model is fairly low quality, because concentrated ownership explains only 8.4% (**R² = .084**) changes in ROE. This model also does not have a problem with multicollinearity (VIF < 10).

Table 3. Multiple OLS regression (dependent variables: ROA and ROE)

Variables	ROA				ROE			
	R ²	Sig	B	VIF	R ²	Sig	B	VIF
<i>Own_conc</i>	0.130	.008	-.315**	1.010	0.084	.027	-.267*	1.010
<i>Liquidity</i>		.201	.149	1.006		.668	.051	1.006
<i>Activity</i>		.601	-.061	1.006		.538	.073	1.006

** p<0.01, * p<0.05.

Source: Author's calculation

CONCLUSION AND RESEARCH LIMITATIONS

The results of the conducted research show that increasing the ownership concentration over 55% has a negative impact on financial performance. Concentrated ownership negatively affects ROA, which confirmed the research hypothesis **H₁**. Concentrated ownership has significant and negative impact on ROE, which implies that the hypothesis **H₂** is accepted.

Theoretical approaches emphasize the importance of ownership concentration to achieve better results of companies in developing countries and transition economies. However, increasing the concentration of ownership over a certain level provides the opportunity for the majority shareholder to make decisions in his own interest, or at the expense of minority shareholders and the whole company, due to the extraordinary rights he acquires in this way. Results of this research paper support the results obtained by Mueller, Dietl & Peev (2004), Lskavyan & Spatareanu (2006), Pervan, Pervan & Todoric (2012), Stančić, Čupić & Obradović (2014). Balsmeier & Czarnitzki (2010) report the existence of an U-shaped relationship between ownership concentration and financial performance, which is also in line with the results of this study. Therefore, a moderate ownership concentration will be in the function of improving financial performance, while the increase in the concentration of ownership above the level that is determined as moderate, will negatively reflect on the financial performance.

The results support the hypothesis about the expropriation of minority shareholders rights by majority owners. The reason for the absence of notable implications of concentrated ownership on financial performance is the presence of inadequate legal regulations in the area of protecting minority shareholders' rights, which has been confirmed by The Global Competitiveness report according to which Serbia has reached 138th place in category of the protecting minority shareholders for the year 2015. Serbia has improved when it reached 137th place out of 138 countries in 2017. In addition, transition economies are characterized by the underdevelopment of capital and labor markets, which makes these mechanisms less effective in disciplining management. For this reason, managers who can be shareholders at the same time have no real threat or danger that their position will be compromised, which encourages them to behave opportunistically.

Serbia has done a lot to improve its legislation in the area of protecting the minority shareholders' rights, primarily through the adoption harmonize its legislation with the legal system of the European Union. But the essential problem is in their inadequate implementation and non-compliance with them by relevant stakeholders (Đulić & Kuzman, 2012), which provided the opportunity for large shareholders (controllers) to direct the available resources of the company in order to achieve their own goals.

The results obtained make a good roadmap for further research in order to eliminate research constraints. First, only one independent variable concentration of ownership was used. It would be appropriate to include in the analysis and other important segments of the ownership structure, such as: the rights of minority shareholders, institutional ownership, family ownership, ownership of legal and natural persons, foreign ownership, insider ownership. Secondly, the research sees the concentration of ownership over 55%. In order to identify a U-shaped relationship between ownership concentration and financial performance, it is also necessary to analyze the effects of different levels of lower ownership concentration and compare them with different levels of higher ownership concentration. Thirdly, in order to identify the optimal level of ownership concentration, which can improve financial performance, different levels of ownership concentration on financial performance based on the model of Perrini, Rossi & Rovetta (2008) should be analyzed in the next research. Fourthly, for the purpose of measuring financial performance, only ROA and ROE were applied. In order to get the right idea of financial performance, it is necessary to take into account other indicators such as Return on

Investment (ROI), Return on Sales (ROS), net profit, revenue growth. Fifth, the analysis needs to include other control variables, such as company size, company age, leverage etc. to determine whether and to what extent other factors cause changes in financial performance.

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**KEY ISSUES IN MANAGEMENT
AND MARKETING 2**

ELECTRONIC WORD OF MOUTH - THE CASE OF SLOW TOURISM

Dražen Marić¹, Slavica Tomić², Ksenija Leković³

Abstract: *In the past few years, the application of the Internet in the field of marketing has grown at an exponential rate. By analyzing numerous scientific and professional papers, as well as by observing and studying the business practices of numerous companies, it can be concluded that the Internet gradually evolved from, primarily, a communication medium into a sales and/or distribution(marketing) channel, and finally into a platform for managing consumer relationships and virtual social networks. The effectiveness of traditional marketing activity declines rapidly, while at the same time competition intensifies to the highest level, globally. Many marketing theorists and practitioners consider cyber space to be the solutions to those problems i.e. the use of virtual social networks and communities, within which intensive word of mouth communication between consumers occurs continuously. For these reasons, the Internet must be seen as an opportunity for companies to connect with their customers who use it to share online their impressions, experiences and recommendations with other consumers, to whom they may or may not be personally acquainted. Interactivity as the basic characteristic of the Internet has enabled a new dimension of interactions and relationships of all participants in the market, with a special emphasis on interconnection and establishment of the relationship between the consumers themselves through the form of electronic word of mouth communication. The capacity for marketing usage of electronic word of mouth communication is undoubtedly enormous, but marketing practice has not yet determined to what extent the real usage of it is possible i.e. to what extent the consumers are willing to act and behave in the manner that the company expects them to behave. At the same time, this turbulent technological and information development and acceleration of the pace of life has developed the consumers' need for completely opposite processes – return to nature and a slower and more complete consumers' experience of products and services, which is particularly manifested in the tourism sector through the emergence of a new concept called "slow tourism", i.e. tourism which involves making real and meaningful connections with people, places, culture, food, heritage and the environment. The aim of the paper is to expose the phenomenon of electronic word of mouth communication, as a consequence of technological progress, in the new field of tourism, "slow tourism", which is also a consequence of the same progress but with different prefix, in the Republic of Serbia.*

Keywords: *electronic word of mouth, consumers, slow tourism, marketing relationships*

JEL Classification: *M 31,Z 32, Z 33*

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INTRODUCTION

Contemporary achievements of the technological process, notably the development of information technologies, break down spatial and temporal barriers existing in an economic and social system. In relation to the traditional marketing environment, the greatest changes, generated by the company's current marketing environment, are associated with the technological dimension – electronic environment – and result in a new role of the consumer on the market and in society. Undoubtedly, the emergence of the Internet as the key, or, one might say, revolutionary change in the marketing and technological environment, has changed relations on the market in terms of their manifestation, and in the sense of the strength of the negotiating position, reducing time the domination of companies and other organisations, and increasing the domination of consumers at the same. A generally accepted opinion of the current marketing theory and practice is that it is more appropriate to call the 21st century the century of consumers than the century of technology, as the reality is that consumers are the strength generating the majority of present and future business income, and that, rather than modern technological solutions, they create value for the company. Although new technology provides enterprises with a much broader insight into consumer behaviour, it must be emphasised that consumers use this very technology to control their interaction with enterprises and other institutions on the market, which also implies entirely new challenges set before marketing theory and practice (De Bruyn & Lilien, 2008). Bearing in mind the growing role of consumers and declining role of companies in their mutual interactions, Deighton & Kornfeld (2009) identified five types of activity of consumers in the electronic environment – browsing the Internet in search of information and entertainment, use of digital appliances such as smartphones and 24/7 internet connection, exchange of digital content (e.g. music in mp3 format) and other transactions between users (e.g. eBay), using virtual identities and joining virtual communities, and creating and sharing entertaining and creative contents, and related them to responses of companies, and the emergence of new areas of marketing action. Unlike the first two types, representing consumers' individual activities, the other three types of activity are based on mutual interactions, relations and value exchange between the consumers themselves. The Internet dramatically enabled and prompted mutual interactions and interpersonal communication and interpersonal communication between consumers. This global phenomenon of information dissemination and exchange among consumers implies both positive and, often, negative information on companies and their offer. As a consequence of this global phenomenon of consumer information exchange, companies have the problem of controlling and responding to this consumer information, and especially the problem of implementation of marketing activities on local markets.

When discussing tourism as one of the most significant areas of the service sector in both global and national economy, it has undergone various stages over the course of its existence and development, so that nowadays we are witnessing a reorientation of tourist trends from mass-oriented to selective, i.e. specific forms of tourism. Due to a large number of various motives representing the drivers of tourist movements, new, specific forms of tourism emerge. As additional factors, environmental sustainability and personal/social welfare represent two essential driving forces of these forms of tourism (Moore, 2012). Tourists' motives and satisfaction feature as a basis for understanding consumer, i.e. tourist behaviour (Xu, Chan, 2016). Although motivation is only one of the numerous variables shaping tourist behaviour, it is a critical variable for marketing and destination, representing the driving force of any behaviour (Jensen, 2015). Robbins & Cho (2012) point out that the modern hectic lifestyle results in an increase in individual stress, leading to a desire for “slowing down” and escaping from everyday life. In such conditions, slow tourism, as one of the contemporary trends, offers a solution to this need (Georgica, 2014). Marketing theory and practice do not offer many research studies on the ubiquitous electronic interpersonal eWoM communication in the sphere of slow

tourism, and in this sense, this study should be understood as one of pioneer undertakings in this geographic area, conducted with the aim of presenting the two phenomena resulting from the technological process, but with opposing prefixes, and to establish whether gender as a demographic determinant influences the manifestation and dissemination of deal consumers' eWoM in the sphere of slow tourism in Serbia.

LITERATURE REVIEW

The emergence of the Internet can be viewed as a revolutionary event with multiple implications for society, economic system and science in general. There are a lot of controversies among researchers concerning the prefix of the emergence of the Internet, in the sense that many scholars and practitioners point to the negative impact of the Internet on its users' mental health and social life, whereas others refute this claim, highlighting the positive changes brought about by his phenomenon, which are viewed in the direction creating a new dimension of communication processes and social linkage. Electronic, i.e. online communication is "appealing to socially anxious, withdrawn, introvert persons, who compensate their problems in social functioning through this form of communication" (Bodroža, Jovanović and Popov, 2008, p. 20). The Internet and communication through it enable its users to affirm and accomplish themselves on the social level. By their nature and functioning, virtual social networks bring about significant changes in the collective consciousness of entire mankind. What makes virtual social networks so appealing and effective are its basic characteristics: (Bulović, Čavić, Matović, 2013): interactivity. Individualisations, participation, transparency, focus on communities, great user abilities, conversation, and global linkage. Meiners, Schwarting and Seeberger (2010) point out that the emergence of the Internet has significantly changed the patterns of exchanging positive and negative consumer opinions about all aspects of their existence, primarily in the sense of facilitation and increase in speed. Unlike tradition offline interpersonal communication, which implies uttered statements exchanged between individuals in direct face-to-face contact, electronic online interpersonal is transmission of thoughts, statements and attitudes by means of electronically written words. The main advantage of the electronic written word compared to the uttered word is in the fact that the former can be distributed from a position, e.g. home, without using up time, effort or other resources. The electronic written word is more formal and unchangeable, and is often regarded as more sincere. Such online interpersonal communication has changed the traditional model of interpersonal communication has changed the traditional model of interpersonal communication, which follows the sender-message-recipient pattern, introducing a new form of communicator – transmitter or forwarder. The Internet must be understood as an opportunity to link with their consumers who use it to share their impressions, experiences and recommendations with all other consumers on the network, whom they may or may not know personally. The Internet also changes the manifestation form of interpersonal communication, which no longer implies face-to-face conversation, and can be performed simultaneously with an enormous number of consumers, in different locations worldwide. Information has nowadays become available and easy to verify, so that consumers, in their communication through virtual social networks, form, correct and change their opinions and behaviour towards companies and their brands (Dobele et al., 2007; Evans & McKee, 2010; Gregurec et al., 2011). Electronic interpersonal communication can be defined as "any positive or negative statement made by potential, actual, and former customers about a product or a company via the Internet" (Cheung & Thadani, 2010). The authors point out the increasing use of Web 2.0 technology – online discussion forums, consumer review sites, weblogs, social virtual networks etc., to disseminate and share information on products and companies themselves. In this sense they state that the number of online consumer reviews has reached the number of 116 million and is still on the rise, and that 83% of Internet shoppers report that they made their purchasing decision based on online product evaluations and reviews, i.e. directly as a result of

digital interpersonal communication (p. 329). The development of communication and information technology, and general digitalisation of society, have led to the fact that any individual with Internet access can experience their own significance and their own contribution, even in terms of affecting and changing certain events. Personal ego and personal emotions become public in terms of directing them to the public according to personal preferences. This form of self-confirmation of individuals in society is very similar to Heidegger's nihilist understanding of modernity (Murthy, 2012., p. 1063.)

On the other hand, it can be said that such a turbulent technological process has caused an unexpected change in the expected consumer behaviour patterns. The accelerated pace of life has resulted in the emergence of so-called consumer resistance, in the sense that the latter are trying to slow down this pace as much as possible. Such a sociological phenomenon is especially visible in tourist industry. Slow tourism is a holistic approach within which travel, destination and return represent a consumer's, i.e. tourist's unique experience. Thus, Lumsdon & McGrath equate the concept of slow travel as travel and slow tourism as a way of enjoying the destination. According to Dickinson & Lumsdon (2010), slow travel is characterised by transport by bus, train, bicycle, or on foot, enabling tourists to enjoy the specialities of local cuisine, customs, habits and culture of the local population. This way connects tourist experience on the one hand and the benefits drawn by the local communities and stakeholders on the other (Caffyn, 2012). Although the term "slow" is associated with time, this term stems from the use of the word "slow" within the slow food movement, Cittaslow (slow cities) and slow consumption (Fullagar et al., 2012; Hall, 2012). Namely, slow travel and slow tourism evolved from the slow food movement (Kummer, 2002), which is devoted to food based on the principles of high quality and taste (Yurtseven & Kaya, 2011). This movement emerged in Italy in 1986, as opposition to the cult of fast food, with the aim of promoting the quality of food and local food products (Robbins & Cho, 2012). Over time, the movement also extended to cities (slow city movement, Cittaslow), with the basic idea to improve living conditions both in urban and in rural areas. Robbins & Cho (2012) point out that the core ideas of these movements are quality of food, quality of life, promotion of sustainable development and local production. Caffyn (2007) defines slow tourism as tourism involving building connections with people, places, culture, food, heritage and the environment. According to Conway & Timms (2012), slow tourism means making a decision to slow down and enjoy the travel itself. Similarly, Guiver & McGrath (2016) refer to slow tourism as conscious decision making. Slow is also an acronym: S – sustainability; L – locally; O – organic; and W – whole. It can be concluded from the above that slow tourism has a potential to offer "win-win-win", in the sense that it represents a special form of sustainable tourism contributing to the welfare of the local community and offering pleasure and a new experience to consumers, i.e. tourists.

With the spread of the Internet, electronic interactions among tourists have become commonplace, which has led some tourism researchers to point out that eWOM plays an important role in the acquisition and retention of tourists and have become important sources of information for travellers with reports indicating that each year hundreds of millions of potential visitors consult online reviews (Pan et al., 2007, Litvin et al., 2008). The majority of travel purchasers visited a message board, forum, or online community before purchasing travel online because they believed online reviews would be helpful to their purchase decision. A recent survey indicated that more than 74 percent of travellers use the comments of other consumers as information sources when planning trips for pleasure (Gretzel & Yoo, 2008). The authors further claimed that reviews provided by other travellers are often perceived by readers to be more up-to-date, enjoyable, and reliable than information provided by travel service providers. Marketing literature establishes that, alongside a number of other factors, the electronic WoM information to which the individuals are exposed influences the forming of destination perceptions prior to

the visit. Tourists are utilizing the Internet and online resources for their information needs (Gursoy & McCleary, 2004). According to the report of Vlachos (2012), about 87% of international tourists have used the Internet to plan their own trips and 43% have read reviews made by other tourists – consumer decision making processes are strongly influenced by eWOM from other consumers. Vermeulen and Seegers (2009) conducted an experimental study among 168 participants to determine the impact of online reviews on the attitudes of travellers to hotels, and revealed that exposure to online reviews enhances the awareness of hotels and positive reviews can improve the attitudes of travellers toward hotels. Tourists' reviews are quite important in the purchase of travel services (e.g., destinations, hotels, restaurants) because people find it difficult to assess the quality of intangible products (in this case, tourist services) before consumption. Therefore, consumers tend to rely on online reviews (a form of electronic word of mouth communication), which allow them to obtain enough indirect information and experiences of the same services which have been previously purchased by other persons, in order to reduce the level of perceived expectations (Ye, Law, Gu and Chen, 2011). Jalilvand and Samiei (2013) studied how online information influences the tourist destination choice. They found that online WOM communications have a significant impact on attitudes toward visiting destination and intention to travel.

METHODOLOGY

The survey conducted in order to confirm or reject the hypotheses set uses a research method in the form of structured personal communication, i.e. questionnaire, whose dissemination and response retrieval was conducted predominantly through the Internet and personally. The survey aimed at accomplishing the set research goals and confirming or rejecting the defined hypotheses was conducted from February until April 2018 on a defined stratified sample of 251 respondents. Stratification was performed by gender, respondents' age and education levels. The data gathered by means of the questionnaire were processed by appropriate mathematical and statistical methods, with the application of statistical SPSS software, as follows: Parametric tests – Normal distribution – testing the hypothetical proportion value of the basic set, based on the sample; Analysis of variance, i.e. ANOVA dispersion analysis with 1, 2, and 3 samples (t-test Levene's test).

The questions from the questionnaire that was used were tested by Cronbach's alpha method. The main idea behind this idea is that the measure instrument that has more variables can be regarded as reliable if all the variables express the same method but slightly differently. Cronbach's alpha is 0.738, which points to high internal consistency, i.e. questions in the questionnaire stand in positive mutual correlation.

The scale applied in this research was adapted according to Marić (2014), and consists of 18 items, but, due to paper length limitations imposed by the conference, this paper only presents a number of items, i.e. statements aimed to confirm or reject the defined hypotheses. The items are arranged with a Likert scale of offered reply options.

H₀: There is a significant statistical difference between respondents of different gender regarding the analysis of eWoM, in the sense of the impact of positive compared to negative eWoM when choosing slow tourism destination and dissemination of positive eWoM in comparison to negative, as a consequence of satisfaction and offer of slow tourism (H₁), and the belief that eWoM reduces the risk of wrong decision and choice of destination of slow tourism (H₂).

RESULTS AND DISCUSSION

Out of the sample of 251 respondents in Serbia, 26%, i.e. 66 of them were male and 74%, i.e. 185 were female, and the majority of them replied that they did not use the Internet to disseminate

information on products and services to other consumers – as many as 21%, whereas out of respondents using the Internet for this purpose, the highest percentage of them do it 2-3 times a month (18.7%), then 2-3 times a year (17.1%), then 2-3 times a week (14.2%), while only 7.1% of the respondents spread interpersonal messages several times during the day. It is indicative that one out of five respondents did not answer this question, which means that either a large number of the respondents are not Internet users, or use it predominantly for entertainment and socialising. It is interesting to note that 4.6% of the respondents stated that they were not members of social networks. The most popular social networks in the Serbian sample are Facebook and Instagram, where as many as 64.1% of the respondents stated that they used these networks. For the purpose of comparison, the percentage of respondents using only Twitter is 1.4%, whereas 2.1% of the respondents pointed out that they were members of other social networks, such as LinkedIn, Google+ etc.

It is beyond doubt that the Internet as a communication medium and Web 2.0 technologies enable senders of information to send messages to a fantastic number of recipients, in a short time and minimum effort, but one is also confronted with the fact that potential recipients are not always willing to receive this information. The informatics sector launches, on a daily basis, a large number of software packages intended especially for this purpose, i.e. to protect consumers from unwanted messages on the Internet. Cumulatively, 46.6% of the respondents view and pay attention to all messages recommended and shown by friends, but only 9.6% of consumers expressed absolute agreement with this statement. A very similar and somewhat higher percentage is found with respondents who absolutely disagree with the above statement (10.1%), whereas 35.1% respondents do not view advertisements that their friends bring their attention to, and a significant percentage (17.7%) have a neutral attitude. Only 5.6% of the respondents expressed full agreement with the statement that they actively forward on the Internet advertisements and marketing information that they find important and interesting. The question, actually, referred only to the commercial message that the consumer personally finds interesting, and this is why the percentage of those who do it absolutely is disconcertingly low. Furthermore, a very low percentage of respondents in the sample stated that they mostly do it – only 12.7%, which all together amounts to 18.3% consumers who forward interpersonal marketing messages. This question is also characterised by an extremely high percentage of respondents (45%) who fully disagree with the above statement, i.e. do not forward online recommendations or criticism, and such a high percentage did not appear in any other question in the questionnaire. When one adds the 17.9% percent who mostly do not forward received interpersonal criticism, recommendations and advertisements, this adds up to a high 62.9% of consumers who do not use the Internet to forward interpersonal communication. Most often, they do not open unfamiliar messages from unfamiliar senders – as many as 46.65% respondents do not open such mails at all, so that, together with the 21.7% of those who mostly do not open them, makes 68.3% respondents who have practically no impact on any possible internet marketing activities of companies or individuals. The percentage of respondents without a defined opinion was 11.3%, which means that only 5.4% of the respondents in the sample belong to the group of consumers who always open and follow all the messages that they receive through the Internet.

Variance analysis by applying T test for two variables did not establish existence of statistically significant differences between respondents viewed by gender. As p-value is higher than 0.05, it can be concluded with a probability of 95% that there are no statistically significant differences between male and female respondents to Question 5, and the zero hypothesis – that variances in samples are equal – is confirmed. A great majority of male and female respondents (59.4% and 56.7% respectively) replied positively, with primarily partial and full agreement with the statement that their purchase decision will be influenced more by positive than by negative

interpersonal communication. One must also point out the fact that a significant number of both male and female respondents were neutral when assessing the statement.

Question 5. My decision to purchase a slow tourism deal is more influenced by positive recommendations than negative criticism by other consumers.

Table 1. Structure of respondents' replies by gender

Question 5	males	%	females	%
Fully disagree	4	6.0	13	7.0
Partly disagree	8	12.1	27	14.6
Neutral	16	24.2	40	21.6
Partly agree	23	34.8	68	36.8
Fully agree	15	22.9	37	20.0
TOTAL:	66	100	185	100

Source: Author's calculation

Question 6. I actively disseminate my experience when I am delighted with slow tourism deals than when I am disappointed.

Table 2. Structure of respondents' replies by gender

Question 6	males	%	females	%
Fully disagree	5	7.6	17	9.2
Partly disagree	11	16.7	26	14.0
Neutral	14	21.2	17	9.2
Partly agree	15	22.7	52	28.1
Fully agree	21	31.8	73	39.5
TOTAL:	66	100	185	100

Source: Author's calculation

Variance analysis by applying T test for two variables did not establish existence of statistically significant differences between respondents viewed by gender. As p-value is higher than 0.05, it can be concluded with a probability of 95% that there are no statistically significant differences between male and female respondents for Question 6, and the zero hypothesis – that variances in samples are equal – is confirmed. A great majority of male and female respondents (54.5% and 67.6% respectively) replied positively, with primarily partial and full agreement with the statement that they will spread their experience much more actively when they are delighted than when they are disappointed with the purchased products and services. One must also point out the fact that a significant number of male respondents were neutral when assessing the statement (21.2%), whereas the number of neutral replies by female respondents was disproportionately lower – only 9.2%, which demonstrates are much more prone to disseminating and behaving according to the impact of positive interpersonal communication than men.

Question 10. Advice from other consumers reduce the risk of wrong purchase decision and increase the feeling of certainty of the correctness of one's own purchase decision.

Variance analysis by applying T test for two variables and Levine's test for equality of variance established the existence of statistically highly significant differences between respondents

viewed by gender for Question 10. As p-value is higher than 0.05, it can be concluded with a probability of 95% that **there are statistically significant differences between male and female respondents regarding Question 10** in the sense that the zero hypothesis is rejected and a stricter criterion, starting from the assumption that variances are different in samples when it comes to the opinion that other consumers' advice reduce the risk of making a wrong purchase and increase the feeling of certainty of the correctness of one's own purchase decision, is accepted. Observing the value of standard deviations result in a conclusion that average deviations of individual responses from the mean value are higher in the case of female respondents.

Table 3. Structure of respondents' replies by gender

Question 10	males	%	females	%
Fully disagree	1	1.5	7	3.8
Partly disagree	4	6.1	17	9.2
Neutral	7	10.6	16	8.6
Partly agree	27	40.9	109	58.9
Fully agree	27	40.9	36	19.5
TOTAL:	66	100	185	100

Source: Author's calculation

Table 4. ANOVA T test

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Question 10	Male	661	4.12	.968	.050
	Female	1852	3.83	.972	.029

Source: Author's calculation

Table 5. Levine's test for equality of variance

	Levene's Test for Equality of Variances		t-test for Equality of Means							
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
								Lower	Upper	
Pitanje br.10.	Equal variances assumed	1.015	.314	4.982	1491	.000	.290	.058	.176	.404
	Equal variances not assumed			4.992	634.506	.000	.290	.058	.176	.404

Source: Author's calculation

The list the relevant questions from the survey which was conducted are:

1. I distribute my experiences on visited slow tourism destinations to others only when I am very satisfied or very dissatisfied with the same.
2. I bought some slow destinations arrangements primarily on the basis of other consumers' recommendations and gave up some of the other purchases primarily due to criticism of other consumers.
3. Despite the negative comments other consumers, I will very rarely still decide to purchase a slow tourism arrangement.
4. I search the other consumers' advice and experience even when I am a great adherent and loyal customer with respectable level of knowledge and experiences and slow tourism arrangements.

5. My decision to purchase a slow tourism arrangements is more influenced by positive recommendations than negative criticism of other consumers.
6. I distribute more actively (even when I am not asked) my experience when I am delighted by slow tourist arrangements than when dissatisfied with the same.
7. I distribute more actively my experience when I am appreciated as a customer by the sellers' attitude than when the slow tourist arrangement is maximum or disappointing quality.
8. I distribute more actively my experience of slow tourist arrangements and destinations more with consumers that I know such as friends and relatives than the people I do not know.
9. My purchase decision is mostly affected by recommendations and criticism of other consumers - relatives and close friends and then consumers that I do not know personally, and only at the end the sellers' suggestions.
10. Other consumers' advice reduce the risk of wrong purchase decision and increase the feeling of security in the correctness of my own purchase decision.
11. If I knew that another consumer advised me to purchase or not purchase something because they are paid by someone who does it, that is, that he has some material interest, I would reject this advice so as not to influence (or influence much less) my purchase decision, even in the case of my friends and relatives.
12. I consider myself as someone who is approached for advice or opinion, that is, I give purchase advice to others more often than when I ask for them.
13. I place more trust in other consumers' advice when I know that they are experts in that area than when I know that they are similar to by character and interests.
14. How often do you distribute information on products and services to other consumers personally or through the internet.
15. I am an active member of social networks:
 - a). Facebook, b) Instagram, c) I use both networks, but I prefer Facework, d) I am a member of another social network (LinkedIn, Twitter), e) I am not a member of social networks .
16. I most often review and pay attention to all adverts pointed by my internet friends.
17. I actively forward by email the adverts, criticisms and recommendations that I find significant and interesting.
18. I do not open emails from unknown senders.

CONCLUSIONS AND RECOMMENDATIONS

The emergence of the Internet can be regarded as a revolutionary event with multiple implications for society, economic system and science in general. Nowadays, companies establish interactive relations with consumers, who use the Internet as an integral part of their daily existence. It can be freely said that the Internet has dramatically enabled and prompted mutual interactions and interpersonal communication and interpersonal communication between consumers. This global phenomenon of information dissemination and exchange among consumers implies both positive and, often, negative information on companies and their offer. There are a lot of controversies among researchers concerning the prefix of the consequences of emergence of the Internet, in the sense that many scholars and practitioners point to the negative impact of the Internet on its users' mental health and social life, whereas others refute this claim, highlighting the positive changes brought about by his phenomenon, and which are viewed in the direction creating a new dimension of communication processes.

These authors believe that the Internet does not devastate the social existence of its users, but rather intensifies it through creating and strengthening quite new forms of social linkage, the so-called social virtual networks. It is beyond doubt that the accelerated pace of life, which is a result of technological progress and involvement of (primarily) information technologies into our daily life, has resulted in resistance of a large number of individuals to this trend, which is manifested with consumers' increasingly expressed needs and articulated desires for slowing

down and a fuller devotion to oneself and one's own needs. In this sense, slow tourism represents this solution. On the other hand, the commercialisation of slow tourism as well must be based on contemporary information and communication technologies, as the decision and choice of destination and offer of any form of tourism is nowadays made predominantly based on eWoM through the Internet, regardless of whether the tourists are female or male. Electronic WoM plays an extremely important role in the democratisation of the contemporary society as well. Contemporary Internet technologies enable an average individual to become highly socially visible and influential, which changes the balance of power in society from the elite and establishment to anonymous individuals. Not rarely, there are situations when, in the clash of information from traditional media and information from social media and networks, the latter prevail. These trends also result in a cultural evolution where eWoM enables individuals to promote and criticise not only products, services and ideas, but themselves as well.

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COMPANIES' COMMUNICATION THROUGH OFFICIAL WEB SITES AND SOCIAL MEDIA – CASE STUDY OF CROATIA

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Abstract: *Complex and dynamic global modern business environment driven by the advent of Web 2.0 and empowerment of individual stakeholders, supported by information and communication technologies has opened a new era of disclosure of a business. Widespread usage of the internet, World Wide Web and social media has changed the way companies do their business and how they communicate with all interested stakeholders. The content of that communication must be published in an easy to use and share form ready for dissemination across all social media. Driven and empowered by social media, stakeholders have also raised their expectations and now require to receive more information without time lag about the company and its products and services. In response to the dynamic and stakeholder-oriented environment, companies with strategic positioning of corporate communications function try to assure a two-way dialog with their stakeholders through the official web sites and social media.*

The aim of this paper is to provide evidence of transparency and the progress of selected companies' in corporate communications function, more precisely disclosure on official web sites and social media. The development of communication function is observed through the components such as: 1) basic web disclosure; 2) investor disclosure; 3) career possibilities; 4) brand and products presentation; 5) strategy – disclosure of company's mission and vision; 6) corporate social responsibility; 7) media disclosure; and 8) social media presence on company's official web site.

The sample was chosen from the top 500 value added Croatian companies in the year 2008 (according to the Institute for Business Intelligence). Analyzed companies are Croatian companies with the highest value added ranking in that year. The survey was undertaken in 2010 as a first iteration, and the repeated one was conducted in 2018, with the aim to explore progress in terms of web and social media communication.

We can assume there is a positive trend in all previously mentioned companies' disclosure components to all interested stakeholders, and that companies with higher value added score (based on the 2008 ranking) showed higher progress in the last eight years in spite of the recession, and represents current state of the art and top of the development of companies' disclosure through the official web sites and social media in Croatia. Descriptive statistics is used to argument this hypothesis and to research how top Croatian companies have accepted modern communication channels to communicate with interested stakeholders.

Keywords: *Management, Corporate Communications, Social Media*

JEL Classification: *D83*

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INTRODUCTION

In the 21st century communication as a management function can be observed as a crucial strategic function in companies' management. Development and widespread usage of the social media created a completely new perspective on the function of open communication channels and required more engagement with those channels 24/7/365.

The advent of the social media which started as 'Just for fun' communication platforms within friends eventually opened a new era of companies' communication, with or without its presentation at social media in a sense of having an official company account, some companies even believe that if they are not present on social media, nobody talks about them. However, the truth is opposite, i.e. the image of any company may be seriously damaged on social media whether it is present on it or no. Therefore, having an active account may be even more useful to monitor the situation and to react in an appropriate way, especial during a crisis. Open communication channels make companies more visible to all interested stakeholders and more vulnerable than ever before, because of the two-way communication, and possibility of followers to post anything they wish about the company.

Companies use social medias in many ways: 1) presenting products or services; 2) attracting employees; 3) attracting new customers or keeping the existing ones; 4) showing community engagement or social responsibility; 4) supporting customer care departments; 5) sharing news about the company; and 5) even showing future investors who they are and where they can be in the future. Whatever the main purpose of social media presence is, it should implement a strategic and synergic approach, in line with company's overall communication and corporate strategy.

The main purpose of this paper is to analyze evidence of companies' communication through the social media. In addition, 50 Croatian companies listed as the best ones according the value added will be compared. First survey was conducted in 2010 (Bilic, 2010), and the repeated one in 2018. The reminder of this paper is organized as follows: 1) theoretical aspects of new media as the key factors in communication; 2) research methodology; 3) results and discussion, and at the end 4) conclusions, recommendations, research limitations and suggestions for future research will be provided.

LITERATURE REVIEW – SOCIAL MEDIA AS THE KEY FACTOR IN COMMUNICATION

Cornelissen et al. (2006) noted that future of any company depends critically on how it is viewed by key shareholders and stakeholders such as investors, customers and consumers, employees, and local community in which the company resides. Since then, beside a widespread usage of World Wide Web, many social media have been launched such as Facebook, Twitter, Instagram, LinkedIn, YouTube, Google+, Pinterest etc. Corporate communication is a management function that offers a framework for effective coordination of all internal and external means of communication with the overall purpose of establishing and maintaining a favorable reputation with stakeholder groups upon which the organization is dependent (Cornelissen, 2008).

Growth in the use of social media at the same time depends on the information that the followers receive through the social media and the dialogue between followers of a company's social media and company is based on mutual trust (Diffley et al., 2011). According to the 2007 PRSA Wired for Change Survey, the majority of public relations professionals confirmed that the use of communication technology, e.g. social media has made communication professionals' job easier by expediting the circulation of information to reach broader audiences (Eyrich et al., 2008). All types of organizations, from government departments and corporations to small

businesses are increasingly adopting social media for strategic corporate and organizational communication and public relations (Macnamara and Zerfass, 2012).

Management needs to recognize corporate communication through company's official web site and social media as a part of communication function which serves as a strategic management function. Strategic approach, disclosure and open dialog with interested stakeholders is a form of invisible capital, which the companies owe, and valuable competitive advantage on the global market.

RESEARCH METHODOLOGY

The methodology employed in this research is supported by the review of recent literature in the field of communication and especially by previously conducted research in the field of communication and the internet and social media as a new medium of communications. In order to research the current state of the field in Croatian business practice, the sample is chosen in 'the best 500 Value Added' Croatian companies and the highest (top 50) value added in the year 2008 (according to the Institute for Business Intelligence) are analyzed in both phases. The main purpose of this research is to explore whether the companies have recognized the power of Web 2.0 presence and social media in its business. A previous research (Rogosic, Ramljak and Bilic, 2008) revealed that basic web disclosure correlated with companies' value added. Value added is a relatively new performance measure whose basic concept was developed on income statement elements, developed by Croatian scientist Belak, with the aim to overcome traditional business performances, which are not adjusted for different business and accounting practices (Belak, 2003).

Data was collected by desk research in two phases. The first phase was conducted in January 2010 as a part of a wider research about the web and social media presence of Croatian companies. The second research was conducted in the period July-August 2018, more focused on social media and Web 2.0 as a two-way communication between companies and their interested stakeholders. A questionnaire was not specifically developed for the second phase, but the one from the previously mentioned research was used and new questions related to the new social medias developed and established since then were added.

In addition to social media presence at companies' official website, some other relevant components of basic web disclosure were considered such as: information for investors, presentation of companies' brands and products, head hunting – career opportunities, mission and vision disclosure and media relations, which were incorporated into this research.

Six components were observed: 1) basic web disclosure – existence of company's official web site, English version of the web site, search engine, and contacts; 2) investor disclosure – existence of a direct link for investors on the company's official web site home page, announcement of financial reports and accuracy of reports; 3) career possibilities - relations were observed only through the existence of a direct link on company's home page for employees, possibilities for completing a job application online and vacancies; 4) brand and products presentation; 5) strategy – disclosure of company's mission and vision; 6) corporate social responsibility – direct link, information about CSR activities, information about sponsorship and donations; 7) media disclosure - was observed through the existence of a direct link to the media, announcing press release to the media; and 8) social media presence on company's official web site – Blog, Twitter, Instagram, Facebook, LinkedIn, YouTube, Google+ and Pinterest.

RESULTS AND DISCUSSION

As this research was not conducted with the aim to explore in depth the quality of the companies' communication over Web 2.0 and social media, but the aim was to rather explore the state of companies' communication at this particular moment and to reveal progress made in the last eight years, basic descriptive statistic will be employed.

Table 1. Basic web disclosure

Question	2010	2018
Number of companies	48	41
Percentage of companies	96%	82%
English version	81.25%	87.80%
Search engine	81.25%	92.68%
Contact information	87.50%	73.17%

Source: Author's calculation

The results presented in Table 1 show that 7 companies out of 50 do not operate in Croatia any more under the same structure as 8 years ago, mostly because of mergers and acquisitions (5 companies). It is also obvious that more English versions of web sites were introduced and that the usage of search engine increased, while there is less contact information available.

Table 2. Information for investors

Question	2010	2018
Direct link for investors	58.33%	48.78%
Published financial reports	37.50%	51.22%
Accurate financial reports	68.75%	46.34%

Source: Author's calculation

The results presented in Table 2 are somewhat surprising, and show a decrease of direct links for investors on companies' home pages from 58.33% to 48.78% and show an increase of publishing financial reports on the companies' web site, from 37.50% to 51.22%. Finally, it is obvious that a high proportion of companies decreased the accuracy of published reports of by more than 22%.

Table 3. Career possibilities

Question	2010	2018
Direct link for Career of HR	64.58%	80.49%
Open applications	45.83%	53.66%
Vacancies	35.42%	53.66%

Source: Author's calculation

Even though Croatia has faced a high unemployment rate between these two surveys, headhunting has become harder, as finding a right person who will fit the corporate culture and will be capable to help achieve organizational goals has become quite difficult. Therefore, companies obviously opened their communication towards potential employees, looking for those who are more proactive and interested to participate in building companies' future.

Table 4. Brand and product presentation at company's official web site

Question	2010	2018
Presentation of brands/products and services	37.14%	87.80%

Source: Author's calculation

The results presented in Table 5 lead us to the conclusion that Croatian companies have raised awareness of the importance of strategic statements and have showed a significant increase in the presentation of company's vision and mission statements at companies' official web sites.

Table 5. Strategy – disclosure of company's vision and mission

Question	2010	2018
Vison	32.81%	53.66%
Mission	41.67%	56.10%

Source: Author's calculation

Table 6. Corporate Social Responsibility

Question	2010	2018
Direct link at home page - CSR	50.00%	63.41%
Information about CSR activities	39.58%	34.15%
Information about sponsorship and donations	37.50%	36.59%

Source: Author's calculation

Regarding the presentation of company's CSR activities, it is obvious there is no clear progress and only a presentation link about companies' CSR has showed a progress of 13.41%. CSR was already very popular in 2010, and has since become a very important presentation feature and *condition sine qua non* of any successful company. Maybe these results may be explained as an evolution process within companies, who have directed more attention to becoming socially responsible in their core business(es), rather than becoming philanthropic with sponsorship and donations for the whole community.

Table 7. Media disclosure

Question	2010	2018
Direct link at home page for media	64.58%	68.29%
Press release	45.83%	70.73%

Source: Author's calculation

Direct link for the media was already present in the 1st phase of this research with 64.58%, and showed very weak progress, while press releases have increased which means that the companies discovered the power of publishing news about the company at the official web sites.

Table 8. Social media

Question	2010	2018
Blog	0%	9.76%
Twitter	2.08%	26.83%
Instagram	N/A	21.95%
Facebook	2.08%	53.66%
LinkedIn	0%	39.02%
YouTube	0%	34.15%
Google +	N/A	19.51%
Pinterest	N/A	7.32%

* N/A launched after 2010, and not relevant for the 2010 survey results

Source: Author's calculation

McCorkindale (2009) found that 69% of Fortune 500 companies are using social networking sites. However, in the 1st phase of this research it was revealed that Croatian companies did not recognize the power of social media in 2010. The 2018 research results revealed significant

progress, especially with Facebook usage, accompanied with LinkedIn and YouTube. It is obvious that Croatian companies have recognized the power of social media. However, there is still room for progress. Facebook is the most popular global social network, and the most popular one in Croatia so the results are in line with that, along with LinkedIn as the second most used network. The most surprising social network is Instagram, the newest one, but obviously already used with some companies who have already realized that youth likes Instagram the most.

CONCLUSIONS AND RECOMMENDATIONS

It is obvious that Croatian companies have recognized social media as a new communication channel, which is the most important progress between the two researches. Furthermore, they are all focused on Facebook as the most popular media, with Twitter and LinkedIn being more professional and business-oriented media. Despite of social media, it is interesting to note how investors and CSR have been neglected, while brand and product presentation, along with headhunting have shown progress. Vision and mission presentation have shown moderate progress, while press releases and have made the biggest progress.

The most important conclusion from this research is the fact that companies have recognized and have raised awareness of building and maintaining communication with interested stakeholders via companies' web sites by creating their own content in the form of press releases or as social media posts. There is a still room for improvement, but it is obvious they have behaving more proactively, since most stakeholders use web and social media as their main sources of information.

The main limitation of this research is the fact that it is just about the evidence of components presence at the companies' web sites and there provided links for social media, without deeper analysis about the content of that communication. A deeper analysis of the content of that communication would lead to conclusions that are more valuable. That type of analysis will be more than challenging, but some of the big data software could be employed.

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CONTRIBUTION TO BUSINESS COMPANIES THROUGH OCCUPATIONAL SAFETY AND HEALTH ACTIVITIES

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Abstract: Occupational safety, more specifically occupational safety and health, is an ever-neglected issue by employers in Serbia, who often ignore the significance of the economic effects of occupational safety and their impact on productivity, cost-effectiveness, and profitability of doing business. In recent years, as many foreign companies entered the Serbian market, the issue has been brought into focus. Occupational injuries and professional and other diseases are often the result of accidents that lead to cessation of work and sick leave, which in turn incurs certain costs for employers and social insurance funds. Many authors concluded that the total cost incurred by occupational injuries and professional and other diseases is much higher than it may seem. To counter this finding, investing in preventive measures for occupational safety and health can only reduce direct and indirect costs, and, consequently, reduce the number of sick days and lost workdays. This also improves the worker's motivation and reduces the insurance premiums, thus increasing efficiency and productivity of a company. Nationally, such a state is reflected in reduced social insurance and healthcare costs, which leads to lower taxes, increased economic performance, and added social benefits. The aim of this paper is to use the existing literature and statistical data and good practice examples from the surrounding to emphasize the importance of investing in preventive measures for occupational safety and health regardless of a company's size. According to the most recent statistical data, an average of about 2.78 million workers die annually across the globe as a result of occupational injuries or professional and work-related diseases. Fatal and non-fatal occupational injuries are much more frequent in developing countries, especially in the fields of agriculture and fishing, construction and civil engineering industry, and the service sector. Globally, from 2 to 4% of the GDP on average is paid to mitigate workplace accidents and injuries. Studies conducted in Great Britain have shown that the total cost incurred due to occupational injuries or health issues due to poor work conditions falls between 5 and 10% of the overall company income. It can be claimed that the efficiency of implementing occupational safety and health measures does not only affect the productivity and cost-effectiveness of a company, but also the quality and competitiveness of its products. Hence, it is in a company's direct interest to implement these measures as efficiently as possible. Each investment in occupational safety and health measures is beneficial for any company. This paper attempts to highlight how proper implementation of occupational safety measures (technical safety measures, education and practical training of employees) and organization of occupational safety and health tasks can significantly contribute to a more cost-effective business.

Keywords: Occupational Safety And Health, Occupational Injuries, Economic Effects, Business Companies, Protective Measures

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1. INTRODUCTION

According to the definition of the International Labour Organization (ILO), occupational safety and health is a discipline dealing with improvement of work conditions and the work environment, prevention of occupational injuries, professional and work-related diseases. In other words, occupational safety and health implies work conditions in which specific preventive measures and activities are taken in order to protect the life and health of employees in the workplace and other persons entitled to such protection.

According to the principles of the United Nations (UN), the World Health Organization (WHO), the ILO, and the European Union (EU), as the leading authorities in protecting the natural and occupational environment, the right to occupational safety and health is one of the basic human rights, because only a safe and healthy work environment can provide social and economic well-being. It is in the best interest of the entire community, the state, all business entities, and every individual to achieve the highest possible level of occupational safety and health, so that all the unwanted effects, such as occupational injuries and professional and work-related diseases, could be prevented or minimized. If employees are to feel content while doing their jobs, employers need to ensure that the work conditions provide the sense of complete physical, mental, and social well-being. A healthy, able, motivated, and safe employee is not only an individual goal but a social priority, as well. Accomplishment of this goal requires a systematic approach to preventive action and implementation of specific workplace measures. Preventive measures in occupational safety and health should be implemented at the very beginning, in the facility design and construction stage, as well as during planning and organizing production, technological, or other processes in the company according to the current laws and regulations.

“The protection of the worker against sickness, disease, and injury arising out of his employment” is stated as one of the priorities in the Preamble of the ILO Constitution (1919), and nothing has changed up to this day. The ILO is based on fundamental principles contained within the Occupational Safety and Health Convention (1981, No. 155), the Occupational Health Services Convention (1985, No. 161), and the Promotional Framework for Occupational Safety and Health Convention (2006, No. 187). The ILO adopted over 40 international standards that directly or indirectly regulate the field of occupational safety and health (Bilić & Buklijaš, 2006).

Cost effectiveness of companies is to a large extent affected by the state of occupational safety and health. Nowadays, large, medium-sized, small, and even micro companies aim to conduct socially responsible business. In order to provide insight into socially responsible business and to monitor the global success of companies, a unifying manner of reporting was introduced. The Global Reporting Initiative (GRI), introduced in 1997, is a reliable and globally accepted manner of reporting about sustainability, with a specific terminology and defined standard performance measures, to be utilized by any company, regardless of its size, activity, or location. According to BIZLife data, in late 2017 in Serbia, a total of 11 companies issued these reports, which became obligatory for companies conducting their business in the EU, pursuant to Directive 2013/34/EU and the amending Directive 2014/95/EU. The portion pertaining to occupational safety and health is regulated by standard GRI 403: Occupational Health and Safety (2016), belonging to the GRI 400 group of standards dealing with social topics.

IMPORTANCE AND ROLE OF OCCUPATIONAL SAFETY AND HEALTH IN COMPANIES

The importance of occupational safety and health is stated in Article 60, Paragraph 4 of the Constitution of Republic of Serbia (2006): “Everyone shall have the right to respect of his person at work, safe and healthy working conditions, necessary protection at work, limited working

hours, daily and weekly interval for rest, paid annual holiday, fair remuneration for work done and legal protection in case of termination of working relations”.

The Labour Law prescribes general obligations for employers regarding occupational safety and health by stating that employees are entitled to safety and protection of life and health at work, pursuant to the Law. It further states that jobs with increased risk of injury or professional or other diseases can be performed only by employees who meet both the conditions established in the regulations and the conditions regarding health status, psychophysical abilities, and age, pursuant to the Law. Although in principle the Constitution and the Labour Law prescribe specific obligations of employers regarding occupational safety and health, the primary law dealing with this field in more detail is the Occupational Safety and Health Law. In late 2015, after more than 10 years, the Law on Amendments and Supplements to the Occupational Safety and Health Law was enacted, while additional supplements were added to the Law in 2017. The reason for amending the original law was to clarify certain uncertainties that had arisen in the original law.

The role of occupational safety and health is determined by the goal, rights, and obligations of employers and employees. The aim is to adhere to the Law and other regulatory acts to achieve the highest attainable level of protecting physical and mental health of employees in the workplace. Accordingly, work conditions, equipment, and organization need to be adjusted to worker needs, but the employees must at the same time be motivated to participate in all activities. The importance of occupational safety and health can be viewed from three perspectives: humane, social, and economic.

According to the WHO definition, “health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity”. Hence, occupational safety and health does not imply only protection of employees against occupational injuries and professional and work-related diseases, but also protection against violations of their moral integrity, dignity, and privacy in the workplace. *Work in humane conditions* is satisfying to every individual, but also implies success of work organizers, employers, and the society as a whole. *The social importance of occupational safety and health* is best expressed through the number of occupational injuries, diseases, and deaths after which the society is supposed to take care of them or their families in case of death. *The economic importance of occupational safety and health* is understood differently in different countries due to a number of differences in the way certain concepts and phenomena are understood and due to differences in legal obligations. What is common to all methodologies assessing the economic effects of the efficiency of implementing occupational safety and health measures is the monitoring of the dynamics of occupational injuries, fatal injuries, and professional and other diseases, expressed by financial indicators that directly depend on the number and severity of registered cases. At the company level, costs can be viewed from the perspectives: costs for implementing measures and activities to ensure occupational safety and health and costs incurred by lost work hours/days due to occupational injuries and professional and other diseases. These costs additionally include the costs of treatment of injured or sick workers, sick leave compensation, court-ordered damages, and the like. Occupational injuries and professional diseases increase employer costs because they require additional hires to replace the absent workers, including training for healthy and safe work, as well as compensation for injured or sick employees. Occupational injuries halt production, leading to reduced profits. This means that proper organization and implementation of occupational safety and health measures impacts the productivity and cost-effectiveness of a company’s business, as well as the quality and competitiveness of its products on the market.

OCCUPATIONAL INJURIES AND PROFESSIONAL DISEASES

According to the ILO estimates (2014), every year around the world there are over 2.33 million occupational injuries with a fatal outcome. The number of occupational and fatal injuries is considerably higher in developing countries, especially in agriculture, construction, industry, and mining.

In Serbia, the registry of occupational injuries and professional diseases is kept by the following state institutions: Labour Inspectorate, Occupational Safety and Health Administration, Pension and Disability Insurance Fund, and the National Health Insurance Fund, but due to the absence of a unified registry, the data collected by these institutions differ. Serbia has yet to harmonize the publication of statistical data related to the number of occupational injuries and professional and work-related diseases. In 2013, the Ministry of Labour, Employment and Social Policy initiated a pilot project for a unified registry of occupational injuries in the Valjevo region, with a plan to implement it across Serbia from June 2014. Unfortunately, the registry has still not been introduced.

Table 1. Comparative overview of the data on the number of occupational injuries, severe injuries, professional diseases, and fatal injuries from 2009 to 2016

Report/year	2009*	2010*	2011*	2012*	2013*	2014*	2015	2016	Total
Occupational Safety and Health Administration									
Occupational injuries	9,391	8,670	10,247	6,765	7,766	7,457	7,991	9,064	67,351
Severe injuries	1,472	1,222	1,387	829	1,237	1,153	1,176	1,236	9,712
Professional diseases	7	3	7	6	2	1	3	1	30
Fatal injuries	12	4	10	6	3	1	5	8	49
National Health Insurance Fund									
Occupational injuries	21,870	22,301	19,717	15,843	17,556	17,759	19,393	19,549	153,988
Severe injuries	4,172	4,130	3,631	2,841	3,268	3,103	3,395	3,223	27,763
Professional diseases	10	34	41	15	13	7	3	7	130
Fatal injuries	32	37	26	22	32	25	23	47	244

Source: Bulat, P. (2015). Increasing the capacity and strengthening the role of regional civil society organizations to improve working conditions and social dialogue with public institutions (marked with *) and data from the Occupational Safety and Health Administration.

Table 1 shows the comparison of data pertaining to occupational injuries, severe injuries, professional diseases, and fatal injuries, compiled by the Occupational Safety and Health Administration, Pension and Disability Insurance Fund, and the National Health Insurance Fund from 2009 to 2016. The data published by the Labour Inspectorate are not relevant for the analysis of the issue at hand because they only include data on the inspections of fatal, severe, collective, and light occupational injuries. In accordance with the current Serbian regulations, employers and companies are obligated to send the Occupational Safety and Health Administration their reports on occupational injuries, professional and work-related diseases, and fatal injuries.

Table 1 shows that specific data differ by more than 2.5 times. Over the previous eight-year period, the Occupational Safety and Health Administration reported a total of 67,351 occupational injuries, of which 9,712 were severe, 30 were professional diseases, and 49 were cases of fatal injuries. The National Health Insurance Fund data are the ones that give cause for concern, as they paint the actual picture of the state of occupational safety and health in Serbia. According to them, the annual average is 19,249 occupational injuries, which translates to 53 injuries per day or approximately two injuries every hour.

As an example of socially responsible business, we will present the data for a six-year period pertaining to the occupational safety and health system at the company Petroleum Industry of Serbia.

Table 2. General data on the occupational safety and health system at Petroleum Industry of Serbia

Year	No. of injuries	Fatal injuries	Lost workdays	Sick days	No. of inspection visits	No. of measures imposed
2012	106	-	1,651	22,488	817	819
2013	89	-	1,664	14,928	774	692
2014	87	-	2,112	23,368	1,090	453
2015	53	-	567	3,297	902	354
2016	99	-	343	2,436	770	275
2017	119	3	517	2,332	903	159
Total	553	3	6,854	68,849	5,256	2,752
Average	92	3	1,142	11,475	876	459

Source: Petroleum Industry of Serbia (2018). Sustainable development reports from 2012 to 2017.

According to the data over the analyzed period, a total of 553 occupational injuries occurred, translating to an average of 92 injuries per year. In the same period, three fatal injuries were registered, all in 2017. The injuries resulted in a total of 6,854 lost workdays and 68,849 sick days. It is interesting to note the discrepancy between the number of lost workdays and sick days. The discrepancy is explained by a different approach to calculating the indicators of the state of occupational safety and health and the tendency of foreign employers to have as few occupational injuries as possible, which sometimes compels them to conceal the true state of affairs and not to report every injury in accordance with domestic regulations.

During 2017, Petroleum Industry of Serbia received a total of 26.5 billion dinars in investment (c. €225 million), 200 million of which was allocated for employee training.

The management of Petroleum Industry of Serbia “strives in various ways to raise employee awareness of the importance of health protection through mandatory corporate training sessions, seminars, brochures, leaflets, videos and other communication channels, carried out independently or in concert with the Ministry of Health, the Occupational Safety and Health Administration and the Road Traffic Safety Agency. A system has been introduced to monitor and analyse absence from work due to sickness or workplace injuries. Based on sickness absence records and an analysis of medical examinations, employee health profiles are created, targeted medical examinations programmes and health promotion initiatives proposed and educational campaigns, training and seminars organised accordingly. In order to promote health in the workplace, educational movies were made to advise employees on reducing sedentary behaviour. The company provides educational campaigns to employees on how to maintain good health at different ages, presenting latest nutritional developments, educating them on early detection of changes and cancers and organising lectures and workshops on mental health aiming to prevent the negative effects of stress on health. One of the major aspects of the Company’s HSE policy is the development of corporate sports and provision of sports and recreation opportunities to employees, to choose from a range of activities arranged for by the Company” (Petroleum Industry of Serbia, 2017).

OCCUPATIONAL SAFETY AND HEALTH MANAGEMENT

Occupational safety and health management in companies is one of the key segments of successful business. Therefore, it is necessary to introduce in companies every standard necessary for efficient business. The following standards that are important for establishing

efficient occupational safety and health management are currently implemented in Serbia: ISO 9001– Quality management system; ISO 14000 – Environmental management system; OHSAS 18000 – Occupational health and safety management; and ISO 45001 – Occupational safety and health management system (Palačić, 2015).

Standard ISO 9001 is an international standard that defines the requirements a company has to meet within the quality management system in order to harmonize its business with internationally recognized standards. Quality system is a management system that helps companies to realize their goals regarding the quality of their business and/or services. The system comprises the organizational structure, responsibilities of the subjects in an organization, and processes and resources necessary for system management. The purpose of ISO 9001 is to increase the efficiency of companies through implementation of a process approach, and it has the advantage of connecting individual processes and sectors, as well as their interactions. Use and implementation of a quality management system in keeping with ISO 9001 is a possible solution for a more efficient performance of occupational safety and health tasks. It should be noted that the company size is not crucial for introducing this standard.

Standard OHSAS 18001 determines the requirements of an occupational safety and health management system and aims to improve companies' risk management and business activities. The basic principle of introducing a management system in accordance with this standard is that occupational safety and health, as an integral part of the work process, should be implemented into the system of the entire business of a company and to become one of its strategic goals. The standard is fully compatible with standards ISO 9001 and ISO 14001, so it is easier for companies to integrate it into their environmental quality management system. Unlike the legal requirements, the disregard of which implies punitive fees, introduction of OHSAS 18001 is not required by the law and companies can choose whether or not to adhere to it. If a company is to operate properly under OHSAS 18001, it is crucial that employees be informed and acquainted with workplace hazards and safety and first aid measures and procedures. Identification of all hazards in a work environment (including their listing, classification, designation, risk level assessment, and the level of effects) is of particular importance for worker safety and health. Determining the level of risk and health effects and proposing the measures for minimizing these levels is necessary in order to establish the occupational safety and health management system more easily. The company management needs to define the goals and the OHSAS policy and to ensure that the policy is attuned to the risks the company faces. Such a policy is company-specific and each company adopts one on its own. It clearly states the goals and adheres to the current legal framework; it is essentially a document available to the public, which is periodically reviewed and harmonized with the changes within the company. All employees have to be familiar with the policy and act accordingly, so that they themselves can contribute to a safer workplace (Palačić, 2015).

Most Serbian companies that implement OHSAS 18001 (78.23 %) have significantly improved their occupational safety and health status and the work of their authorized occupational safety and health officers, while 21.77 % of the companies received a negative evaluation (Živković & Taradi, 2011).

Standard ISO 45001, adopted in 2018, is based on OHSAS 18001 and is used as its replacement. The idea behind the standard was to make it more internationally recognizable and more widely applicable than OHSAS 18001. The standard is structured in accordance with ISO 9001 and ISO 14001 standard systems so that all three standards could be implemented and integrated more easily within a single company. ISO 45001 focuses on the role of management in the occupational safety and health system, requiring deeper involvement of employees and their

representatives, while placing an emphasis on risk control with regard to identifying hazards that increase the risk to employee safety and health (Palačić, 2015).

ECONOMIC ASPECT OF THE ENFORCEMENT OF OCCUPATIONAL SAFETY AND HEALTH LAW

Occupational safety and health affect the realization of the general goals and efficiency of business entities and have a considerable economic and social importance. The economic importance of occupational safety is seen in terms of specific indicators about occupational injuries, fatal occupational injuries, professional diseases, and other work-related diseases, which negatively affect the business results of companies. In addition, they cause significant negative effects on the wider community and the economy of a country, so they also pose a general social issue, because they impose more obligations on the employed population, which bears the burden of having to pay more for their health and disability insurance and other forms of protection. Therefore, the state, as the chief legislative authority, has imposed the mandatory implementation of preventive measures on all work levels and the fulfilment of general and specific requirements, thus compelling companies to provide safe work conditions and protect their employees' health (Spasić & Avramović, 2006).

Preventive measures for occupational safety and health are taken in companies during the work organization stage, and they require the use of modern technical, ergonomic, health, educational, social, organizational, and other measures, as well as risk elimination tools. This in turn requires significant financial support, so the Occupational Safety and Health Law requires companies to provide the necessary finances for ensuring employee safety. For the purpose of better organization of activities and implementation of occupational safety and health measures, the Law also requires companies to pay punitive fees for any violations and failures to comply (Spasić & Avramović, 2006).

Based on an economic analysis of the Occupational Safety and Health Law, the following conclusions can be drawn: implementation of preventive measures and fulfilment of general and specific requirements is costly and due to the poor economic situation in Serbia, only a small number of companies are able to adhere to the Law; the Occupational Safety and Health Law does not recognize or prescribe any incentives for entrepreneurs who make improvements in their work conditions and reduce the number of worker health issues or for those who cannot afford to implement preventive measures; the Occupational Safety and Health Law insufficiently focuses on information sharing, the possibility of public participation in discussing the occupational safety and health issues, and the requirement of state bodies to inform the general public about the state of occupational safety and health.

CONCLUSION

Serbian laws still do not require companies to report on, monitor, assess, and evaluate their financial operations, and to assess their costs of providing and organizing the occupational safety and health system. Unfortunately, despite the adoption of the Strategy on Development and Promotion of Socially Responsible Business Operations in Serbia for the period between 2010 and 2015, few companies have been implementing the Strategy in their daily operations. So far, only large companies in Serbia, specifically 11 of them, have been implementing the Strategy, but these are companies that conduct their business in EU territories and that follow the Global Reporting Initiative (GRI).

One of the more significant measures that could help employers in companies is preventive inspection control of occupational safety and health. This way, companies would be able to use the complaints and guidelines to properly introduce and implement comprehensive measures that

will help improve the occupational safety and health system. Companies should have the following priorities: to strengthen their occupational safety and health system; to strive toward minimizing the number of injuries; to reduce the number of lost workdays; and to increase employee motivation and inspire loyalty from them. One way to encourage companies to promote and strengthen their occupational safety and health system is to organize competitions and issue annual awards to the most successful companies in terms of safety. The awards can take the form of subsidies, such as tax breaks for procurement of modern equipment and tools for personal and collective protection or direct cash grants. The chief contributions of organizing occupational safety and health tasks in companies would include the reduction of large-scale economic losses and promotion of better work conditions and safety, which would motivate employees and increase productivity and efficiency, leading to a higher quality of products and services and increased market competitiveness.

The introduction of a unifying registry of injuries would considerably improve employee safety and facilitate the implementation of preventive measures for occupational safety and health. It would also allow for a proper analysis of the state of occupational safety and health in companies and for the monitoring of their economic efficiency.

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KNOWLEDGE SHARING IN ORGANIZATIONS: EXAMINING THE ROLE OF EMPLOYEES' EDUCATION LEVEL

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Abstract: Knowledge sharing can be considered an important process in organizations, because it is fundamental to generating new ideas and developing new business opportunities through socialization and the learning process of employees. Numerous scholars and practitioners claim that the process of knowledge sharing enables firms improving competitive advantages, the development of intellectual capital, and improvement of work processes that can improve productivity, reduce costs or improve quality. All these reasons encourage companies to pay special attention to the process of knowledge sharing and define ways and tools that can improve this process. There is a number of factors which affect the process of knowledge sharing in organizations and they can be classified as: individual, organisational and technological factors. However, little empirical research has been conducted examining the different factors that influence knowledge sharing process. Based on a survey of 97 employees from companies in Republic of Serbia, the subject of this work is impact of employees' educational level on knowledge sharing. The objective of the research is to determine whether the employees' educational level has a positive impact on knowledge sharing in organizations. In relation to the set goal of research like this it is possible to define two sub-goals: whether there is a statistically significant difference in knowledge sharing between employees with different educational level; whether higher educational level means better knowledge sharing between employees. In order to achieve defined aims multiple regression analysis, ANOVA analysis are conducted. The results of the empirical research study have proven the existence of a statistically significant positive influence of education level of employees on knowledge sharing practice, while there is a significant difference in the implementation of the practice of knowledge sharing among employees of different levels of education in companies operating in the territory of Republic of Serbia. The purpose of this research is to determine the model for managing knowledge sharing process in organizations depending on different employees' educational level, which can be useful for improving organisational performance. Results of research can be used by HR managers for implementing proper strategy to stimulate knowledge sharing in organization with minimum effort and costs.

Keywords: knowledge sharing, education, Serbia, human resources, knowledge

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INTRODUCTION

The entry of civilization into the knowledge era resulted in changes in the way businesses operate, making the knowledge as the key production resource and the primary source of the rent (Grant, 2002). Knowledge-based approach, as a relevant conceptual framework for understanding business operations in modern market conditions, emphasizes knowledge as the most important factor of innovation, which is essential for work and survival in today's global environment (Stewart, 1997; Dong et al., 2010). Knowledge is the basic source of competitive advantage not only for enterprises but also for nations themselves, and knowledge must be managed efficiently at both individual and organizational levels. Knowledge is the potential for wealth creation (Bohn, 1994), while the capacity for knowledge management is classified as a critical skill (Martínez-Torres, 2006).

In the context of the premise, "knowledge is power" (Grandoriand & Kogut 2002; Hendriks, 1999), individuals have a certain degree of fear when it is necessary to share their knowledge with the actors in their surroundings. Permanent requirements in the field of accumulation of information and knowledge relevant to meeting work requirements (Davenport and Prusak, 1998), consequently point to key barriers in the process of sharing knowledge within organizations. The mentioned individual styles, lack of time and trust are just some of the challenges facing contemporary organizations (Razmerita, et al., 2016).

Intraorganizational knowledge sharing is designated as a key factor of the organization's success (Davenport & Prusak, 1998), since it enables an efficient exchange of relevant information and experiences. This makes relevant knowledge available to organizational units, which directly affect the level of performance achieved (Syed-Ikhsan & Rowland, 2004). At the individual level, knowledge sharing is classified as voluntary activity, which is why it is essential for employees to present the importance of knowledge sharing, which takes place in their own interest (Fullwood & Rowley, 2017). According to Van der Hoof and de Leeuw van Weenen (2004), intraorganizational knowledge sharing is a process in which individuals interchange each other and create together new knowledge.

In this context, the key aspects to be addressed are the factors that are encouraging, but also inhibit the intraorganization of knowledge sharing. Since these are complex interactions, the factors that determine the success of these activities can be grouped into three categories: individual, organizational and technological (Razmerita et al., 2016). Apart from the listed classification of factors, the question arises as to how the demographic characteristics of the individual influence their behavior during the realization of the knowledge sharing activity. Therefore, the main goal of this paper is to present the level of education as a determinant of efficient and effective knowledge sharing in organizations, with an emphasis on explaining the interdependencies of these variables in the context of business operations in the territory of the Republic of Serbia.

LITERATURE REVIEW

According to Williams (2006), knowledge can be defined as a fluid mix of experience, values, and information that creates a framework for evaluating and acquiring new experiences and information. From the perspective of organizations, knowledge does not relate exclusively to information incorporated in documents and procedures, but also implies organizational routines, processes, practices, and norms. The most important characteristics of knowledge are uniqueness and originality, which makes it difficult to copy or replace. The characteristics of knowledge clearly indicate that this is a key strategic resource of the organization (Cabrera & Cabrera, 2002), which is not only a potential source of competitive advantage in today's turbulent

environment, but also its significant contribution to the innovation and business performance of contemporary organizations (Slavković & Babić, 2013).

One of the key assumptions of a knowledge-based approach is the ability to transfer and transfer knowledge between individuals within and between organizations (Grant, 2003). Therefore, there are different strategies of knowledge management and the concept of sharing, ie knowledge exchange. Sharing knowledge is an act of providing accessible knowledge to others within the organization (Ipe, 2003). In fact, the sharing of knowledge refers to a set of voluntary and conscious activities between two or more individuals, which results in a joint ownership of the created knowledge (Ipe, 2003; Vuori & Okkonen, 2012).

Starting from one of the most important dichotomous classifications, knowledge sharing within an organization is represented as a process in which employees exchange their implicit and explicit knowledge among themselves (Nonaka, 2007), which results in the creation of new knowledge. Implicit knowledge can be of a technical or cognitive nature, composed of mental models, values, beliefs, perceptions and assumptions (Smith, 2001), which individuals acquire on the basis of personal experience (Dimension, et al., 2016). On the other hand, explicit knowledge is documented, publicly, structured (Duffy, 2000), codified in the form of books, documents and written procedures (Smedlund, 2009). Based on the given definitions, the conclusion is that the exchange of explicit knowledge requires less effort compared to time and effort when sharing implicit knowledge among employees in the organization (Hau et al., 2013).

Intraorganizational knowledge sharing is considered to be an important process of social interaction (Lin, 2007; Van den Hooff et al., 2012; Ardichvili et al., 2003) and is within the organization at an individual, group and organizational level. At the individual and group level, knowledge sharing involves a "donation" of knowledge and "gathering" knowledge (Lin, 2007; Van den Hooff et al., 2012). "Donation" of knowledge implies motivation of employees to actively communicate with colleagues, as well as consultations with colleagues in order to improve existing knowledge. At the organizational level, knowledge sharing can be defined as acquiring, organizing, reusing and transferring experience and relevant information within the organization, thus ensuring the availability of knowledge to all employees (Lin, 2007). The primary goal of knowledge sharing is the transformation of the individuated into organizational knowledge (Foss et al., 2010).

According to Ipe (2003), the main factors influencing the knowledge exchange are the nature of knowledge, the motivation for exchange, the opportunities for exchange and the organizational culture. Hannon (1997) states that the commitment of employees to the step of knowledge sharing is a twofold challenge: first, employees are not sure whether the knowledge they possess can be of benefit to the organization; second, although the importance of knowledge for organizational performance has been identified, employees do not have to be motivated to share it. The results of previous studies indicate the existence of a wide spectrum of factors that influence the behavior of employees in the knowledge exchange in different industrial sectors and business cultures. According to Lin (2007), factors can be classified into three basic groups: individual, organizational and technological.

1. Individual factors primarily relate to the level of motivation of employees to participate in the process of knowledge sharing (Deci & Ryan, 2000). Deci and Ryan distinguish between the extrinsic and intrinsic motivation of employees, which is based on different goals and reasons that determine the direction of their actions. Internal or intrinsic motivation can be defined as performing some activity due to personal satisfaction of employees, rather than in order to achieve a detachable, usually material consequence. An intrinsically motivated person will initiate action for entertainment or challenges, and not for some external incentive, pressure or reward (Deci & Ryan, 2000). On the other hand, in the context of the extrinsic, i.e. external

motivation, human activity is driven by rewards in the company, primarily by material rewards and chances for promotion (Deci & Ryan, 2000). Extrinsic motivation is based on the perception of the relationship between the benefits (rewards) and the costs (effort) that are realized or invested in the realization of knowledge sharing activities (Wang & Hou, 2015).

At the individual level, it is necessary to consider potential barriers in the knowledge exchange process. The first among them, a fear is which is considered a kind of barrier in achieving employees' behavior in the intraorganizational sharing of knowledge (Razmerita et al., 2016). Research has shown that employees experience their knowledge as power, i.e. a kind of advantage over others, where knowledge transfer is perceived as a process that reduces the value and importance of knowledge carriers (Chow et al., 2000). Also, employees at lower organizational levels often keep their knowledge consciously and deliberately, since they feel that the superiors will not improve them, if they are much more familiar with the area and are better governed by them (Empson, 2001). The lack of time or time required to implement the knowledge sharing process is also represented as an important factor that can influence the effectiveness of the exchange of acquired knowledge, experience and information through built-in social contacts and networks (Razmerita et al., 2016).

Trust is recognized as an important factor that influences the mentioned processes of knowledge sharing in organizations. It is often talked about the mutual trust of employees, who participate in the sharing of knowledge (Hau et al., 2013; Chow & Chan, 2008). Confidence can be defined as a belief that the other party will behave as expected and will not exploit or abuse the current situation (Hsu et al., 2007). Namely, trust as a determinant of the effectiveness of knowledge sharing facilitates the establishment of interaction between employees, encourages informal communication and reinforces the interdependence of team members (Nooteboom & Berger, 1997). In case of lack of trust, there is no effective communication, successful collaboration, and in the end, there is also lack of efficient knowledge exchange. This leads to the conclusion that the effects of knowledge sharing are in proportion to the degree of confidence that the government has within the organization, and the greater trust among associates contributes to the active participation of employees in the knowledge sharing process (Hsu et al., 2007).

2. Organizational factors represent the second set of factors that influence the process of intraorganizational knowledge sharing. The first among them is organizational (corporate) culture, which refers to values, beliefs, systems that can stimulate or inhibit the acquisition of knowledge and its sharing within organizations (Michailova & Minbaeva, 2012). Organizations should support and encourage employees to exchange acquired knowledge and experience (Holsapple & Joshi, 2000). As a set of values and beliefs, organizational culture and a built-in cooperative relationship among employees can contribute to improving the motivation of employees to share their knowledge with colleagues (Hung et al., 2011).

In addition to the aforementioned organizational culture, it is important to point out that the inadequate formulation and implementation of a business strategy, unclear business objectives, and / or the lack of a suitable compensation package for employees can be key obstacles to intraorganizational knowledge sharing (Razmerita et al., 2016). Moreover, in addition to the above mentioned organizational factors, the dimension of national culture (eg individualism / collectivism), which affects the behavior of an individual in the process of knowledge sharing (Zhang et al., 2014), and the characteristics of the organizational culture should not be forgotten either. Luring (2009) points out that organizational culture is a very important factor that determines the performance of an organization and affects the daily work of employees. Knowledge sharing is cited as a social process, with Luring discovering that employees who have more common characteristics are more likely to interact than employees who are more diverse.

3. Technological factors, or implemented technological solutions, have been recognized as an important mechanism for knowledge management and knowledge exchange in organizations. The use of technology is associated with factors such as functionality, usability (Razmerita et al., 2016), with emphasis on invested time and effort (Vuori & Okkonen, 2012), the structure of the platform (Matschke et al., 2014), needs of the users (Hung et al., 2011) for which the technological aspects are classified as important factors that determine the processes of intraorganization sharing of knowledge.

Organizations that use information technology when implementing the knowledge sharing process point out that only the use of technology is not enough to achieve optimal results (Grant, 1996). On the other hand, there are also concepts that represent information technologies as the key factor in improving the sharing of knowledge (Brazelton & Gorry, 2003). Therefore, interpersonal relationships, the atmosphere within the organization and information technology, are emphasized as the basis for the establishment of an effective sharing of knowledge (O'Dell & Hubert, 2011). In fact, working groups, internal and external data networks, storage of knowledge, technologies enable employees to work simultaneously, exchange ideas and expertise, and access knowledge sources.

In addition to the above classification of factors that influence the processes of knowledge sharing in organizations, the influence of the contemporary business environment should not be omitted. In the conditions of a modern business environment characterized by dynamism, unpredictability and uncertainty, demographic change and diversification of the workforce are key challenges for managers of today's enterprises, especially in transition economies (Horwitz, 2011). Population aging, low birth rates are just some of the problems faced by transitional countries and developing countries. In addition, the inescapable problem is the departure of young and highly educated people, who are faced with economic difficulties, seek for better living conditions. As a result of such a trend, there is a problem of finding a workforce, since the departure of experts from the country further complicates the end of transition and economic progress.

In the context of the prominent contemporary challenges, finding a quality workforce is a particular issue and often a condition of existence on today's business scene. In accordance with the objectives of the research, the quality of the workforce in the work was observed through the prism of the level of education of the employees, due to which the given secondary characteristic of the workforce is perceived as one of the important factors that determines the effectiveness of the knowledge sharing process. This is testified to by the results of previous research carried out in countries around the world. By analyzing the impact of demographic characteristics on knowledge sharing processes in organizations in Central Europe, it has been identified that highly qualified employees show less willingness to share their implicit knowledge. In addition, based on the results of the survey, where employees in public and private companies took part, the conclusion is drawn that there is a statistically significant impact of general demographic characteristics, including the level of education, the practice of sharing knowledge in companies in Central Europe (Grubic- Nesic et al., 2015).

The opposite results were obtained by conducting research in the territory of Slovenia, where the total sample counts 268 subjects. Namely, the results of the regression analysis indicate the absence of a statistically significant influence of the level of education on the knowledge sharing process, which is why the relevance of other individual factors, such as the motivation of an individual to become involved in knowledge sharing activities (Jurišević Brčić & Mihelič, 2015), is particularly emphasized. The research in the area of Malaysia was aimed at determining the difference in the sharing of knowledge among employees of different levels of education. Based on the results of the survey, it is emphasized that lower level employees are less interested to

share their knowledge in comparison with employees of higher education (Noor & Salim, 2011). As a logical explanation of the obtained results, the "great pressure" is a consequence of the responsibility of the employees of the higher education level, since the knowledge they possess is of essential importance for the performance of the organization (Nonaka, 1991).

METHODOLOGY

The given a theoretical framework, explained the challenges of modern business environment, as well as the results of previous research, are the starting point for the implementation of original empirical research in order to determine the impact of educational level on knowledge sharing in organizations in the territory of the Republic of Serbia. Filling in the questionnaire, which was specifically designed for the research, was joined by employees in domestic and multinational companies. Data collection among employees was carried out using oral face-to-face interviews with an average duration of 15 minutes. Of the total number of employees who participated in the survey, non-questionable questionnaires were not identified, so that statistical data processing and analysis included 97 respondents.

From the perspective of the respondents the sample structure is determined as: 1) 58% of men, 2) 42% of women. Compared to age, the total sample is: 1) 26% of employees have less than 30 years of age, 2) 60% of employees aged 31-40, 3) 12% of employees aged 41 to 50, 4) 2% of employees over 51 years. In addition, data were obtained on the years of service in the current organization, identifying: 1) 60% of respondents with a working experience of up to 5 years, 2) 32% of respondents with a working experience of 6 to 10 years, 3) 7% of respondents with a working experience of 11 to 15 years, 4) 1% of respondents with a working experience over 15 years. Considering the level of education of employees, it is possible to structure the sample in the following way: 1) 43% of the respondents with secondary education, 2) 23% of the respondents have college education, 3) 34% of the respondents are faculty educated.

Analyzing the characteristics of the organizations, which are included in the sample, is identified: 1) 52% of manufacturing enterprises, 2) 22% of enterprises from the trade sector, 3) 27% of enterprises engaged in the service activity. Observing the ownership structure in the analyzed organizations, the sample consists of: 1) 45% of domestic private enterprises, 2) 51% of enterprises composed of foreign private capital, and 3) 4% of state enterprises in the territory of the Republic of Serbia. From the aspect of the size of the covered organizations, it was determined that the sample consists of: 1) 6% of enterprises with 2-9 employees, 2) 7% of enterprises employing 10-49 people, 3) 42% of enterprises with the number of employees from 50 to 249, 4) 42% of enterprises with over 250 employees. An analysis of the number of employees in the past three years in the given organization identified: 1) 41% of enterprises whose number of employees is increased, 2) 30% of enterprises whose number of employees in the analyzed period is unchanged, 3) 22% of enterprises whose number of employees is reduced by up to 10%, 4) 5% of enterprises whose number of employees is reduced by up to 20%, 5) 2% of enterprises whose number of employees has been reduced by more than 20%.

The questionnaire also has a question in the form of claims with a five-point Likert scale. The goal of this formulated issue is to establish a practice of knowledge sharing within organizations in the Republic of Serbia. The software package SPSS was used for data processing.

FINDINGS

As noted above, the issue formulated for the purpose of researching the practice of knowledge sharing within domestic and multinational companies in the territory of the Republic of Serbia includes the following statements.

Table 1. Knowledge sharing: items

Knowledge sharing	
KS1	The organization encourages employees to formally and informally connect with experts outside the organization
KS2	Workers are constantly experimenting with new ideas and approaches
KS3	Employees exchange information with professionals and experts from their field
KS4	The organization enables employees to get to know the work of other employees in the organization
KS5	Employees in the organization actively promote their professional competencies
KS6	Employees are dedicated to sharing best practices for doing business with their colleagues
KS7	Employees exchange ideas with colleagues on a daily basis in a formal and informal manner
KS8	The organization has formal mechanisms that ensure the sharing of best practice in carrying out work within different parts of the organization
KS9	There are procedures for collecting and distributing employee suggestions, customers / clients and business partners in the organization
KS10	Employees share the knowledge and experience they possess in communication with each other

Source: Authors' research

In order to check the reliability of these statements, the calculation of the Cronbach's alpha coefficient was performed. The resulting value of 0.889 points to the existence of a high level of internal consistency of the above statements. In addition, aggregate indicators such as mean value and standard deviation are calculated. The values of arithmetic meanings indicate the degree of agreement of the respondents with the stated findings.

Table 2. Knowledge sharing: reliability analysis and descriptive statistical analysis

Cronbach's alpha 0,889		
Item	Arithmetic mean	Standard deviation
KS1	3,7629	1,04854
KS2	3,6186	1,01492
KS3	3,7423	0,86937
KS4	3,9897	0,87196
KS5	3,8351	0,98616
KS6	3,8969	0,97344
KS7	4,1031	0,87183
KS8	3,7010	1,09130
KS9	3,6289	1,26918
KS10	4,1753	0,87809

Source: Authors' research

In accordance with the results of the descriptive statistical analysis given in the previous table (Table 2), the conclusion is reached on the highest and lowest degree of agreement between respondents with statements incorporated in the questionnaire. The highest level of agreement has been identified in terms of the ability to use employees' knowledge for practical purposes, while the smallest degree of agreement has been identified in the statement that relates to the level of employee innovation and their tendency to use new approaches and solutions in the work.

Having in mind the basic goal of the research, which refers to the research of the influence of the level of education on the knowledge sharing among the employees, the regression analysis was conducted. The regression model used in this case implies the creation of artificial variables that directly reflect the level of education of the respondents (secondary, college, faculty education). The results of the multiple linear regression analysis test (Table 3) indicate that there is a statistically significant impact of the level of education on the sharing of knowledge among the employees in the surveyed enterprises.

Table 3. Results of multiple regression analysis (dependent variable: Knowledge sharing)

Variable	β	t	sig.
Constant (c)		31,094	0,000***
Secondary education	0,520	5,037	0,000***
College education	0,352	3,406	0,001***

*** The value is significant at the level $p < 0.01$. ** The value is significant at the level $p < 0.05$

* The value is significant at the level $p < 0.1$. $R^2 = 0,221$; $F = 13,357$ *** ($p < 0.01$). $VIF < 5$

Source: Authors' research

In the analysis of the obtained assessments by the respondents, the parameter ANOVA test (Table 4) was used, in order to examine the existence of statistically significant differences in the practice of sharing knowledge among employees of different levels of education.

Table 4. Results of the ANOVA test of knowledge sharing among employees of different levels of education in the Republic of Serbia (P value is given in parenthesis)

Iskaz	SO ^a vs. VO ^b	SO vs. FO ^c	VO vs. FO
KS1	0,46104 (0, 218)	0,80952* (0,003)	0,34848 (0,449)
KS2	-0,07359 (0, 957)	0,82035* (0,001)	0,89394* (0,004)
KS3	-0,11905 (0, 865)	0,48701* (0,049)	0,60606* (0,036)
KS4	0,37662 (0,236)	0,61905* (0,008)	0,24242 (0,576)
KS5	0,43939 (0,217)	0,68182* (0,011)	0,24242 (0,651)
KS6	0,00866 (0,999)	0,85714* (0,000)	0,84848* (0,004)
KS7	0,15368 (0,776)	0,71429* (0,001)	0,56061 (0,050)
KS8	0,20563 (0,755)	0,81169* (0,005)	0,60606 (0,112)
KS9	0,17965 (0,857)	0,83117* (0,017)	0,65152 (0,161)
KS10	-0,16450 (0,740)	0,71429* (0,001)	0,87879* (0,001)

^a Secondary education, ^b College education, ^c Faculty educated

* $p < 0,05$

Source: Authors' research

Based on the results presented in the previous table, the conclusion is drawn that there is a statistically significant difference in terms of the implemented practice of knowledge sharing in companies operating in the territory of Serbia, which is performed between employees of different levels of education. A statistically significant difference has been identified in almost all elements of knowledge sharing, except in the case of findings related to encouraging employees with similar interests to cooperate, as well as applying the knowledge and experience of employees in order to improve work efficiency.

CONCLUSIONS AND RECOMMENDATIONS

Business in a modern market environment brings with it a number of changes and challenges, which makes the academic world more and more talked about knowledge management, the knowledge economy, the complexity of human capital, the impact of innovation and knowledge on the growth of corporations and the economy as a whole. Today, knowledge is the most sought-after goods, the most valuable resource of the organization and the source of its competitive

advantage. Knowledge is a factor of vitality, innovation of the organization and driving force, which affects the efficient use of other resources in the organization. In addition, knowledge is the only resource that is not reduced by sharing, but an effective exchange increases the overall knowledge of the organization.

The explanation for the results obtained is based on the fact that the development of the education system in our country is lagging behind compared to other European economies. According to the World Economic Forum, in terms of the quality of the education system, our country is ranked 103th out of the total of 138 economies. The given data puts emphasis on undertaking measures and actions that will aim at improving the implemented educational programs, which will ultimately contribute to more efficient and effective realization of the knowledge sharing process. Namely, the link between the quality of the education system and the organization's success lies in the exchange of knowledge and understanding of knowledge as the most important intangible resource of the organization.

In addition to the mentioned problem of building an adequate education system and reform in this field, it is necessary to give a wider insight into the possible samples of the obtained research results. In the first place, the post-transitional effects, as well as the consequences of the economic crisis, are stated. Despite favorable macroeconomic trends in the past period, the Republic of Serbia is still faced with difficulties in order to encourage economic growth and development. The repercussions of these difficulties are evident at the grass level, which primarily relate to the inadequately created ambience for removing knowledge sharing among employees. Increased weather pressure on employees as well as rapid technological changes are just some of the challenges that managers and employees in today's enterprises are facing. In addition, the lack of confidence among colleagues is also an important factor that determines the effectiveness of knowledge sharing.

The obtained results of the research have numerous practical implications. First, based on the results of a descriptive statistical analysis, it is possible to identify the aspects of the practice of sharing knowledge in companies in Serbia that need to be improved. Since the researchers took part in the work of both domestic and multinational companies, it is necessary to analyze and harmonize methods and methods of knowledge sharing in order to implement the most effective model of knowledge sharing. Secondly, the results of regression analysis, as well as the examination of statistically significant differences between employees of different levels of education, clearly point to the problem of inadequately developed educational system in our country. The need to implement radical changes in this field becomes a necessity, which is why the integrated action of all relevant actors is suggested, thus creating a favorable ground for future economic progress. Third, successful organizations in the 21st century build their competitive advantage in knowledge. Acquiring knowledge is no longer a privilege of privileged and endowed social classes, but also a necessary condition of life and work - individuals, organizations and national economies. Today, the most developed countries are those who cultivate the cult of knowledge, skills and abilities, which keep pace with technological development and are prone to the implementation of new solutions. Finally, the obtained results emphasize the importance of creating the appropriate structure of employees within the organization, from the perspective of the acquired level of education, since it has been proven that there is a statistically significant difference in the practice of sharing knowledge among individuals that has a distinct educational level. Particular attention should be given to stretching the knowledge sharing process, whereby the balance in the required levels of education of employees is of fundamental importance. The stated balance aims at stimulating and building the atmosphere in a given business environment, which will enable the achievement of optimal results in the field of intraorganization and interorganizational knowledge sharing.

The research whose results are presented in the paper has several limitations. The first limitation refers to the size of the sample. Although the criterion of the minimum number of respondents in the sample is formally satisfied, it can be concluded that it is small, since it is made up of 97 interviewed employees. The reason for the low willingness of the employees to participate in the research is, in fact, the underdeveloped business culture and the closeness of the organization, which directly limits the possibility of interviewing a larger number of respondents. The second limitation refers to the pattern of the sample, i.e. characteristics of respondents and organizations covered by the research. In order to eliminate the potential danger of a generalization of attitudes, research focus needs to be carried out so that only domestic or multinational companies are included in the sample, which would enable the creation of an optimal model of knowledge sharing among employees. The third limitation refers to the analysis of the educational profile of employees, which imposes the need for more detailed analysis of the acquired knowledge and skills, in order to gain insight into the relevance of the expertise of the employees for the performance of the organization.

These limitations are also guidelines for future research. Sample extension, focusing research, analyzing non-formal and informal education of employees are just some of the ways to gain insights and outline factors that determine the success of knowledge-sharing activities. In addition, future research should focus on identifying the causes of the research results presented in the paper. In the first place is the determination of the influence of organizational and technological factors, which are cited as the key determinants of the effectiveness of knowledge sharing among employees. Further research on this topic should include a wider range of demographic characteristics of the workforce, in order to determine the influence of the given characteristics of the respondents on the processes of intraorganization and interorganizational knowledge sharing. In the end, since the survey covers only employees of the company in the territory of the Republic of Serbia, the next research should include employees in companies based in other European countries as well as countries in the region in order to compare the obtained results and gain insight into potential distinction in the field of knowledge exchange.

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MODERATING EFFECTS OF GENDER ON USER SATISFACTION IN MOBILE COMMERCE

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Abstract: *Modern technologies are changing everyday lives of people worldwide. Lower prices and higher availability led to the very high penetration of mobile technologies, particularly mobile phones in all parts of the world. Due to its powerful capabilities, mobile phone is no longer used only for vocal or text communication, but also for more complex and sophisticated services like commerce. Mobile commerce (m-commerce), or the use of mobile devices for commercial activities, is one of the fastest-growing businesses today. About 75% of mobile internet users made a purchase via mobile devices in the past six-month period. The objective of the paper is to examine the factors influencing consumer satisfaction in mobile commerce, and the moderating effects of consumer's gender on these relations. The proposed research model consists of 9 constructs: Customer involvement, Social influence, Mobility, Personal innovativeness, Customization, Trust, Usefulness, Ease of use and Satisfaction. The study involved 224 respondents, who are clients of one of the three mobile network operators in the Republic of Serbia. Confirmatory factor analysis is used to test the validity of the research model, and structural equation modeling (SEM) is applied to determine variables which have significant influence on user satisfaction. The findings indicate that Customization, Trust, Usefulness and Ease of use proved to be significant triggers of Satisfaction. Out of the four antecedents, Customization has the strongest impact on Satisfaction. In addition, results of invariance analysis show that the two observed groups (men and women) are different. This generally supports the moderating effect of gender. Subsequently, multi-group SEM was also applied to compare the values of each individual effect between the two variables achieved in both groups. Originality of the paper is provided through investigation of moderating effect of gender, which is done by using the invariance analysis. The study provides useful theoretical implications, as well as managerial implications for mobile commerce stakeholders. It is essential that the management of mobile providers continuously works on improving the system of personal data protection. It is necessary for citizens to be well informed about these security systems, but it is also important that marketing campaigns highlight all the benefits that mobile commerce offers to customers.*

Keywords: *mobile commerce, e-commerce, customer satisfaction, gender*

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INTRODUCTION

First mobile phones were the mobile versions of regular phones, enabling users to establish vocal communication from any location covered by mobile network signals. The development of technology (hardware and software) led to the new capabilities of mobile phones, like text and e-mail messaging and limited internet access. Finally, more powerful mobile phones, called smartphones, came in the last years of previous decade, with computer-like capabilities and a lot of options and applications. Today, the number of mobile subscriptions worldwide is higher than the number of the inhabitants of Earth (International Telecommunication Union, 2017). Although there are other mobile devices, smartphone is the most important representative of this category, with more than 1.5 billion new units produced and sold in 2017 (Gartner, 2017).

Mobile commerce (m-commerce), or the use of mobile devices for commercial activities, is one of the fastest-growing businesses today. About 75% of mobile internet users made a purchase via mobile devices in the past six-month period (Interactive Advertising Bureau, 2016). Also, eMarketer (2017) estimates that B2C m-commerce today accounts for one-third of total e-commerce sales in the US, with the forecast that it will surpass 50% by 2021. One of the key questions for marketers is how to attract mobile shoppers and how to keep them loyal i.e. which factors influence their decision to adopt mobile shopping and to keep satisfied.

There are many studies on determinants of m-commerce acceptance (Agrebi and Jallais, 2015; Chong, 2013a; Chong, 2013b; Faqih and Jaradat, 2015; Kalinic and Marinkovic, 2016; Wei et al., 2009; Yadav et al., 2016; Zhang et al., 2012). On the other hand, due to its novelty, the number of published researches on consumer satisfaction in m-commerce is very limited (Marinkovic and Kalinic, 2017). The objective of presented study is to examine the factors influencing user satisfaction in mobile commerce, and the moderating effects of consumer gender on these relations.

The paper is structured as follows: Section 2 presents the literature review of similar studies on factors influencing satisfaction in m-commerce. Section 3 outlines proposed hypotheses and the research model. Section 4 details the methodology used in the study, while Section 5 presents data analysis and the research results. In Section 6, we discuss various implications of the obtained results. Finally, in Section 7, we explain the main limitations of our study and potential steps for further research.

LITERATURE REVIEW

Consumer satisfaction is a phenomenon of vital importance to all m-commerce stakeholders, as only satisfied customers will continue to use m-commerce i.e. to become loyal (Deng et al., 2010). According to Bhattacharjee (2001), it is five time more expensive to acquire new customer that retain existing one, so m-commerce providers pay a special attention on customer satisfaction and loyalty. However, since m-commerce is still a novelty in many countries, the number of scientific studies on factors influencing customer satisfaction, continence intention to use and loyalty in m-commerce is rather limited.

Gao et al. (2015) found flow, satisfaction and trust to be significant predictors of continuance intention towards mobile shopping, while as the main predictors of customer satisfaction system quality and privacy and security concerns were reported. Likewise, self-efficiency and user satisfaction were found as the main antecedents of continuance intention towards mobile banking services, while confirmation and perceived usefulness were found as the key predictors of the satisfaction (Susanto et al., 2016).

The influence of perceived usefulness, perceived ease of use and attitude towards using mobile application services on customer satisfaction was investigated by Lee et al. (2015). On the other

hand, Agrebi and Jallais (2015) tested the influence of perceived usefulness, perceived ease of use and perceived enjoyment on mobile shopping satisfaction. Besides perceived usefulness and perceived ease of use, Yeh and Li (2009) examined the influence of additional variables like customization and interactivity on customer satisfaction towards m-commerce provider. Zhou (2011) examined trust, perceived ease of use and perceived usefulness as the predictors of satisfaction with mobile website. Likewise, Lin and Wang (2006) explored the influence of perceived value and trust on customer satisfaction in m-commerce context.

The customer satisfaction in m-commerce was also examined by Choi et al. (2008), and content reliability and transaction process were found as the main predictors. Deng et al. (2010) studied the impact of perceived value, service quality and trust on customer satisfaction with mobile instant messaging and found that service quality had the strongest influence. Likewise, Kuo et al. (2009) reported perceived value and service quality as the most influential on customer satisfaction in mobile value-added services. The impact of perceived value, enjoyment, time saving and use context on customer satisfaction in mobile tourism shopping was investigated by Kim et al. (2015). Finally, Marinkovic and Kalinic (2017) examined the antecedents of customer satisfaction in m-commerce and the moderating effects of customization. As the main predictors of satisfaction, they proposed trust, social influence, perceived usefulness, mobility and perceived enjoyment.

To the best of authors' knowledge, there are no studies exploring the role of gender on customer satisfaction in mobile commerce. Males are generally considered as more open to new ideas and technologies, and more influenced by perceived usefulness, while women are strongly influenced by perceived ease of use (Tan et al., 2014). In addition, women are more influenced by aesthetic details than men (Okazaki and Mendez, 2013). Liebana-Cabanillas et al. (2014) investigated the role of gender on the acceptance of mobile payments, and identified some significant differences between the attitudes of men and women. Yang (2005) reported gender as a significant predictor of perceived ease of use and usefulness in the m-commerce adoption context. Likewise, Riquelme and Rios (2010) found gender as a moderator of predictors of mobile banking adoption. The influence of gender on intention to use mobile services was also confirmed by Nysveen et al. (2005).

On the other hand, Leong et al. (2013) and Tan et al. (2014) reported that there was no significant difference between men and women regarding NFC mobile credit card adoption. The same was presented by Shin (2009), in the case of the acceptance of mobile wallets. Likewise, Faqih and Jaradat (2015) found that their behavioral model of m-commerce adoption based on TAM3 was robust against gender. Finally, Chong (2013c) found that gender had no significant relationship with any of the four m-commerce activities studied (content delivery; transactions; location-based services; entertainment).

HYPOTHESES AND RESEARCH MODEL

Customer involvement

Involvement in m-commerce implies that the customer is interested in and committed to this purchase environment (San-Martin and Lopez-Catalan, 2013), and that he/she is willing to send feedback to the m-commerce provider, helping him to improve the service or the offer (Yi and Gong, 2013). San-Martin and Lopez-Catalan (2013) reported involvement as a very significant predictor of customer satisfaction in mobile shopping. If the customer is more involved and interested, he will have more positive attitudes towards m-commerce and better understand the possible problems, so we assume that it is more likely that he will be satisfied than a consumer who is not involved or interested in m-shopping. Particularly, we believe that customer involvement will have positive impact on customization (as more interested consumer will be

also more engaged in the customization of a product/service) and trust (as he will better understand the whole process and possible problems), and that this impact varies across genders. Therefore, the following hypotheses are proposed:

- H1. The gender will moderate the relationship between customer involvement and customization.
- H2. The gender will moderate the relationship between customer involvement and trust.

Social influence

Social influence is often seen as the extent to which a consumer perceives that the important others, like relatives and friends, believe that he or she should use m-commerce (Chong, 2013d). Social influence, together with subjective norms, is one of the most frequently suggested predictors in technology adoption studies. In the study on continuance intention to use m-commerce, Lu (2014) reported that social influence had significant impact on perceived usefulness and personal innovativeness. Also, positive effects of subjective norms on satisfaction in m-shopping were confirmed for adult consumers (San-Martin et al., 2015). On the other hand, Marinkovic and Kalinic (2017) reported that social influence did not have significant direct influence on satisfaction in m-commerce. We believe that social environment may have dominant influence on perceived trust and perceived usefulness of m-commerce and that this influence is different for men and for women. Therefore, we suggest the following hypotheses:

- H3. The gender will moderate the relationship between social influence and trust.
- H4. The gender will moderate the relationship between social influence and perceived usefulness.

Mobility

The possibility to shop at any time and from anywhere is one of the main advantages of m-commerce and customer mobility is often seen as one of the main drivers in any mobile service acceptance (Schierz et al., 2010). Mobility brings many conveniences to the consumers, including the reduction of shopping time and costs (no need to travel to the shop) and the possibility to shop when it is most convenient for the customer (during night, short breaks, etc.). Marinkovic and Kalinic (2017) reported mobility as one of the most significant determinants of customer satisfaction in m-commerce. Also, mobility had strong indirect impact, through use context, on satisfaction in mobile tourism shopping (Kim et al., 2015). In our opinion, mobility has a significant impact on perceived usefulness, as consumers find it very useful when they can shop with no time or space limits, but also that there are some differences in this impact between male and female consumers. Therefore, the following hypothesis is proposed:

- H5. The gender will moderate the relationship between mobility and perceived usefulness.

Personal innovativeness

Personal innovativeness is the willingness of an individual to try out new things, for example, new products or services (Kalinic and Marinkovic, 2016). Innovative customers are novelty seekers, usually communicative and curious, more open to risk and unknown. They have more positive perceptions of innovative technologies, and since they like to try out novelties, it is more likely that they will perceive them as convenient and easy to use. In the study on continuance intention to use m-commerce, Lu (2014) reported that personal innovativeness had significant impact on perceived ease of use. However, in our opinion, this influence is moderated by consumer's gender, i.e. the following hypothesis is suggested:

- H6. The gender will moderate the relationship between personal innovativeness and perceived ease of use.

Customization

Customization and personalization of the offer are effective tools to better meet consumers' expectations and increase their satisfaction (Wang and Li, 2012). Customization may be defined as the "degree of offering or recommending tailored content and the transactional environment to individual customers" (Choi et al., 2008, p. 321). Consumers like the possibility to have unique, customized product/service, and this significantly increase their positive attitudes, satisfaction and loyalty. Customization was found as an important predictor, but also a moderator of other predictors, of satisfaction in m-commerce (Marinkovic and Kalinic, 2017). In addition, Yeh and Li (2009) reported significant influence of customization capabilities of vendor's website on customer satisfaction and trust towards online vendor. Therefore, we propose the following hypothesis:

H7. The gender will moderate the relationship between customization and satisfaction.

Trust

Trust plays important role in every business relations, including commerce. It reflects a consumer's positive expectations of m-commerce providers' future behavior (Zhou, 2011). Its significance is even more important and influential in the virtual and wireless environment of m-commerce. Therefore, m-commerce providers should be perceived as trustful, if they want to attract new customers or to keep existing ones satisfied and loyal. Trust was found as one of the most significant predictors of customer satisfaction in m-commerce (Lin and Wang, 2006; Marinkovic and Kalinic, 2017). The same was confirmed by Susanto et al. (2016), in the study of continuance intention to use m-banking services. Zhou (2011) reported trust as the most important antecedent of consumer satisfaction with mobile websites. Finally, Deng et al. (2010) found that trust plays important role in customer satisfaction with mobile instant messages in China. However, we believe that gender also plays an important role in consumer perceptions of provider's trustfulness. For example, Liebana-Cabanillas et al. (2014) found that the impact of perceived trust on the attitude towards usage mobile payments was significantly stronger among women than among men. Therefore, we suggest the following hypothesis:

H8. The gender will moderate the relationship between trust and satisfaction.

Perceived usefulness

Perceived usefulness is one of the original constructs of Technology Acceptance Model (TAM) and one of the most often used predictors in technology adoption and customer satisfaction studies. It is usually defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989, p. 320). Perceived usefulness was reported as a statistically significant determinant of customer satisfaction in m-commerce in several studies (Cho, 2008; Lee et al., 2015; Marinkovic and Kalinic, 2017), while Agrebi and Jallais (2015) found it as even the most important determinant of satisfaction. Zhou (2011) found perceived usefulness as an important predictor of satisfaction with mobile websites. In the study on continuance intention to use m-banking services, Susanto et al. (2016) reported perceived usefulness as a significant antecedent of user satisfaction. The same was reported by Lu (2014), in the research on continuance intention to use m-commerce. On the other hand, Yeh and Li (2009) found no evidence of significant impact of usefulness on satisfaction towards m-commerce vendor. Finally, Liebana-Cabanillas et al. (2014) found that perceived usefulness had a higher impact on intention to use mobile payments among men than among women. But, gender was not found to predict perceived usefulness of mobile banking (Chuan et al., 2012). Therefore, we assume that perceived usefulness has significant influence on satisfaction, but that this influence is different across genders, so the following hypothesis is proposed:

H9. The gender will moderate the relationship between perceived usefulness and satisfaction.

Perceived ease of use

Perceived ease of use (PEOU) is defined as “the overall mental effort of using m-commerce as a post-adoption experience” (Lu, 2014) and also represents one of the original constructs of TAM and frequently used determinant in technology adoption and customer satisfaction studies. Although not so important as perceived usefulness, effortless user experience influences overall user satisfaction. Lee et al. (2015) reported PEOU as a significant determinant of customer satisfaction in mobile services. Yeh and Li (2009) found PEOU as an important predictor of consumer satisfaction towards online vendor. Significant influence of PEOU on satisfaction in m-commerce was also reported by Agrebi and Jallais (2015) and Cho (2008). Finally, PEOU significantly affected customer satisfaction with mobile websites (Zhou, 2011). Also, gender was found to predict PEOU of mobile banking (Chuan et al., 2012). On the other hand, Lu (2014) found that PEOU had no impact on continuance intention to use m-commerce, Also, Nysveen et al. (2005) found no evidence of significant influence of PEOU on intention to use mobile service, for both, men and women. Based on previous studies, we propose the following hypothesis:

H10. The gender will moderate the relationship between perceived ease of use and satisfaction.

Finally, the overall research model is presented in Figure 1.

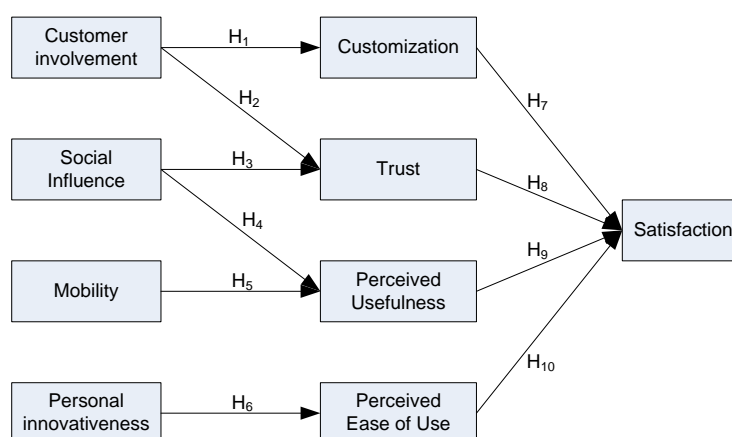


Figure 1: Research model

Source: Authors

METHODOLOGY

The aim of our study is to examine the factors influencing user satisfaction in mobile commerce, and to test the moderating effects of gender on these relations. The study involved 224 respondents, who are clients of one of the three mobile network operators in the Republic of Serbia. Precisely, a convenience sample was used. Gathering data in the Republic of Serbia is usually done through personal, telephone or online-based survey. In this case, we decided to conduct personal interview, since we assume it would yield a relatively high response rate. In line with that, we administered the questionnaires to respondents who were willing to take part in the survey. The respondents were contacted by the interviewers and asked to participate in the survey, when leaving the premises after conducting a specific transaction.

In this study we implemented the multi-item approach, which means that each latent variable was measured through several statements. This approach is common in contemporary marketing field research. Respondents expressed their level of agreement with the statements on a seven-point Likert scale (1 – completely disagree; 7 – completely agree). Selected statements were based on a review of relevant literature (Chan and Chong, 2013; Chong et al. 2012; Wu and Wang, 2005, Wei et al. 2009; Zarpou et al. 2012; Kim et al. 2010; Yeh and Li, 2009; Yi and Gong, 2013; San-Martin and Lopez-Catalan, 2013).

The sample consists almost equally of women and men (55.8 percent are women and 44.2 percent are men). The majority of the respondents are young people, under 45 years of age (79.5 percent). This structure of the sample reflects the fact that mobile commerce is still a new type of service in the Republic of Serbia which is mainly used by young people.

Statistical analysis was implemented in Statistical Package for Social Sciences (SPSS 20) and Amos 18. First, we conducted reliability and confirmatory factor analysis to test the validity of the proposed research model. Second, we used structural equation modeling (SEM) to estimate the statistical significance of the main effects in the total sample. Third, we applied the invariance analysis to determine the moderating role of gender.

RESULTS

Prior to implementing SEM, through reliability and confirmatory factor analysis the suitability of the overall model fit was determined. The results confirm a high level of internal consistency of used statements for measuring every latent variable. Cronbach's alpha values of all factors were greater than the threshold of 0.6, which indicates an acceptable level of reliability. In addition, proposed model adequately fits the data ($\chi^2/df=1.73$; CFI=0.96; TLI=0.95; IFI=0.96; RMSEA=0.06). The results are shown in Table 1 and Table 2.

All confirmatory factor loadings exceeded 0.60, and all were significant at the level of 0.05. Average variance extracted (AVE) for all variables exceeded the threshold of 0.5 (Customer participation=0.61; Social influence=0.58; Mobility=0.76; Personal innovativeness=0.73; Customization=0.79; Trust=0.76; Usefulness=0.84; Ease of use=0.82; Satisfaction=0.78). Thus, convergent validity of the model was confirmed (Fornell and Larcker, 1981). The composite reliabilities of the model is also supported, since the fact that for all latent variables CR values were greater than 0.7 (Customer involvement=0.75; Social influence=0.80; Mobility=0.93; Personal innovativeness=0.89; Customization=0.92; Trust=0.93; Usefulness=0.94; Ease of use=0.95; Satisfaction=0.91).

Table 1. Reliability analysis

Variables	Cronbach's alpha
Customer involvement	0.74
Social influence	0.80
Mobility	0.92
Personal innovativeness	0.88
Customization	0.92
Trust	0.93
Usefulness	0.94
Ease of use	0.95
Satisfaction	0.91

Source: Author's calculation

Table 2. The model – fit indices

Fit indices	Recommended value	Measurement model
χ^2 / df	< 3	1.73
CFI	> 0.9	0.96
TLI	> 0.9	0.95
IFI	> 0.9	0.96
RMSEA	< 0.08	0.06

Notes: CFI – comparative goodness of fit; TLI – Tucker-Lewis Index; IFI – incremental fit index; RMSEA – root mean square error of approximation.

Source: Author's calculation

Based on the structure of the developed research model, 10 effects were tested. First, we conducted SEM analysis at the level of the total sample. The results in table 3 indicate that all 10 effects are statistically significant. It is important to stress that the strongest relationship is present between Customer participation and Customization. The findings clearly show that Customization, Trust, Usefulness and Ease of use proved to be significant triggers of Satisfaction. In addition, out of the four antecedents, Customization has the strongest impact on Satisfaction.

Table 3. SEM results (Overall sample)

Effect	Estimate	p value
Customer involvement → Customization	1.065	0.034
Customer involvement → Trust	0.641	0.006
Social influence → Trust	0.257	0.016
Social influence → Usefulness	0.645	0.009
Mobility → Usefulness	0.467	0.007
Personal innovativeness → Ease of use	0.465	0.005
Customization → Satisfaction	0.498	0.010
Trust → Satisfaction	0.202	0.005
Usefulness → Satisfaction	0.133	0.029
Ease of use → Satisfaction	0.156	0.017

Source: Author's calculation

In our research model, gender is considered to be a moderator that affects the relationship between latent variables. In this case, the sample was split in two groups (women and men). Invariance analysis clearly indicate that the two observed groups are different ($p=0.00$). The results are shown in Table 4. This generally supports the moderating effect of gender.

Table 4. Invariance analysis

Overall model	χ^2	df	p value	invariant
Unconstrained	1404.2	722		
Fully constrained	847.1	367		
Difference	557.1	355	0,000	NO (Groups are different)

Source: Author's calculation

Table 5. Testing the moderation effect (moderator: gender)

Effect	Estimate (Women)	Estimate (Men)	Z score
Customer involvement → Customization	0.915	1.231	1.425
Customer involvement → Trust	0.547	0.738	0.966
Social influence → Trust	0.224	0.373	0.888
Social influence → Usefulness	0.827	0.450	-1.731*
Mobility → Usefulness	0.341	0.565	1.161
Personal innovativeness → Ease of use	0.625	0.324	-2.328**
Customization → Satisfaction	0.564	0.426	-1.020
Trust → Satisfaction	0.088	0.388	2.482**
Usefulness → Satisfaction	0.183	0.058	-1.408
Ease of use → Satisfaction	0.227	0.055	-1.323

Notes: ** p-value < 0.05; * p-value < 0.10

Source: Author's calculation

Concerning the 10 relationships between latent variables of the model, at the level of subsamples (women and men), differences in the three effects were found to be statistically significant (Table 5). First, the impact of Social influence on Usefulness is significantly higher among women than among men. Second, we can conclude that the effect of Personal innovativeness on Ease of use is also higher in the women subsample. On the other hand, our third key research finding indicates that the impact of Trust on Satisfaction is significantly stronger among men. This findings support hypotheses H4, H6 and H8. Finally, it is important to stress that the independent variables explain 79.1% of variance in Satisfaction in the men subsample, compared to 74.5% of variance among women.

CONCLUSION

One of the key contributions of the conducted study is the application of quantitative research and the formation of a new model for measuring the satisfaction of users of mobile commerce services. So far, a relatively small number of researches on this topic has been conducted on the territory of the Republic of Serbia. A special value is provided by a specific combination of the variables of the proposed model and the examination of their mutual relations in the field of mobile services, which still fall into the ranks of new services and whose more frequent use is expected in the future period. In addition, few similar studies conducted in the countries of Western Europe, the USA, or Asia, contained variations of Customer involvement and Personal innovativeness, which enhances the originality of the research model. Also, the model contains fundamental variables in the domain of mobile commerce, which are in almost all models their significant components, such as Mobility, Trust, Usefulness and Ease of use.

The work also provides a certain methodological contribution when it comes to the data analysis process. Specifically, apart from testing the main effects at the level of the total sample through SEM analysis, the moderate effect of the gender was also tested. All respondents were divided into two groups (women and men). In this context, an invariance analysis was carried out, indicating that, in general, there were differences in attitudes between the members of the two observed groups. Subsequently, multi-group SEM was also applied to compare the values of each individual effect between the two variables achieved in both groups.

The analysis of the whole sample showed the statistical significance of all 10 tested effects. Nevertheless, the results indicate that the Customer involvement variable is the key driver of Customization, which is set out below as the strongest user satisfaction antecedence. The research findings clearly state that consumers whose value and lifestyle system are in line with the image and benefits of mobile commerce are mostly ready to engage in the process of creating new services and to provide useful ideas to the management in terms of improving the business process. These consumers show the highest level of satisfaction with mobile commerce services.

The results of the multi-group SEM analysis show that the differences between the two groups were based on 3 out of a total of 10 tested effects. The impact of the social environment on the perception of the benefits of mobile commerce is stronger in the group made up of women. In addition, innovativeness in the use of new information technologies makes women easier to acquire the skills of using mobile commerce services than it is the case with men. Nevertheless, unlike women, men will show a higher degree of satisfaction if they have confidence in the security of transactions that are performed through a mobile phone. In this regard, it is important that the management of mobile providers continuously works on improving the system of personal data protection. It is necessary for citizens to be well informed about these security systems, but it is also important that marketing campaigns highlight all the benefits that mobile commerce offers to customers.

Finally, we can distinguish several potential directions of future research. First, the research was carried out only on the territory of the Republic of Serbia. Therefore, it would be also interesting to comparatively analyze the views of citizens of other Western Balkan countries. This would give the study a wider, international dimension. Secondly, it is always advisable to work on model improvement and on inclusion of new variables. In this context, the security aspect can be analyzed through a number of variables. Thirdly, new studies may include other demographic moderators, such as age, or level of education of respondents.

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Appendix: Questionnaire items

Customer involvement

If I have a useful idea on how to improve service, I let the employee know.
When I receive good service from the employee, I comment about it.

Social influence

Relatives and friends have an influence on my decision to use m-commerce.
Mass media (e.g. TV, radio, newspapers) have an influence on my decision to use m-commerce.
I would use m-commerce more often if the service was widely used by people in my community.

Mobility

I can use m-commerce anytime.
I can use m-commerce anywhere
I can use m-commerce even while traveling.
Using m-commerce is suitable because my mobile phone is always within reach.

Innovativeness

I am eager to try new technologies.
I am eager to learn about new technologies.
My friends and neighbors often come to me for advice about new technologies and innovation.

Customization

I think using m-commerce meets my needs.
I think m-commerce provides information and services according to my preferences.
I think the use of m-commerce is in accordance with my personal norms and values.

Trust

Transactions via m-commerce are safe.
Privacy of m-commerce users is well protected.
M-commerce transactions are reliable.
Security measures in m-commerce are adequate.

Perceived usefulness

Using m-commerce improves my work performance.

Using m-commerce improves my productivity.

Using m-commerce enhances my effectiveness in my work.

Perceived ease of use

I think it's easy to use m-commerce.

I think m-commerce is understandable and clear.

I think using m-commerce requires minimum effort.

I think learning to use m-commerce is easy.

Customer satisfaction

I am quite satisfied with m-commerce services.

M-commerce services meet my expectations.

My experience with using m-commerce is positive.

SYNTHESIS OF COGNITIONS ABOUT CRISIS STATE OF A COMPANY: SITUATION ANALYSIS OF THE COMPANY IN A CRISIS

Sead Omerčević¹, Dženan Kulović²

***Abstract:** There is a high degree of consensus among the reference authors in this field that a company falls into a crisis due to missmanagement. Namely, every form of a crisis can lead to chaos and potential disaster if there is a negative synergy and disorientation of management, but it can also be an incentive, it can motivate creativity and challenge in creating completely new knowledge, approaches, solutions and initiatives. Such a process actively influences the changing attitudes, ways of thinking, behavior and awareness of people, and especially managers who are the most responsible for effective management. There is a significant number of examples in the history of the economy, where some enterprises have disappeared in the branches affected by the crisis, while others have managed to withstand all the challenges, and today they operate more successfully than during the pre-crisis period. The subject of the research in this paper represents actual theoretical and practical problems related to the phenomenon of a business crisis, and systematically and scientifically formulated results of the research on the performance of strategic management in the function of crisis management. In this regard, the company's crisis situation was diagnosed in order to synthesize the conclusions about crisis situations of the enterprise, and special attention was paid to determining whether managers of the observed companies establish the strategy in accordance with familiar theoretical settings, or they to do it through certain empirical methods. The research within this paper has the prospect that through empirical research, key areas, characteristics and causes of a crisis in the process of managing the enterprise in the pre-crisis and crisis period are identified.*

Keywords: *Key words: crisis management, crisis communication, situation analysis, crisis period*

JEL Classification: *M10, M12*

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INTRODUCTION

In a professional bibliography, there are many definitions of business crisis of a company. All definitions have an accent on the crisis as an unwanted event that negatively affects business results as well as achieving company's goals. (Heath, 1998, 5). When the business crisis was discovered, actually when the management admitted that the company was in crisis, the main question raising was the depth of the crisis. The real problem in these situations is that management very often is not sure which methodology to use and which information to take as reliable and most relevant to determine the level of depth of crisis. Actually, it is needed to find the balance between the data from business practice and its importance on one side and accounting data and ratios delivered in numbers which do not tell as much, on other side. (Omerčević, Kulović, 2018). Every crisis means and presents unpredictable circumstances of business with uncertain results. This means that business performance is endangered. According to Brendl (1190, 23) crisis forces developing defensive mechanism in order to keep the path or make innovative strategy. When management detects crisis state in a company (even in a deep phase), it is very important to have a vision of moves to overcome the crisis. In order to implement vision, it is necessary to present clear but rational plan at the same time. Organizational aspect of overcoming the crisis requires implementation of a plan using needed experts and other resources. Making a turning point in business means operating in certain time period in which performances and business results need to be converted into positive. (Omerčević, Kulović, 2018). The main question in all discussions is why some leaders (managers) are trying to stop business failure while other managers hide and neglect the signs of crisis and let the company go into bankruptcy. The purpose of the research is to examine the managers' stats for the purpose of synthesizing information on crisis situations in small and medium enterprises of the wood processing industry of Bosnia and Herzegovina. The work is divided into three key areas. In the section referring to the literature review, the present research related to the recognition of symptoms and the causes of the crisis was presented. In the second part, the research methodology was presented for the needs of the work, and in the third part the presentation and discussion of the results of the research was performed.

LITERATURE REVIEW

The main focus of understanding the crisis is defining the crisis as a disorder which endangers physical system of a company as a whole and its purpose as seen by Pauchant and Mitroff (1992, 21) or defining the crisis as a serious threat to fundamental values and standards of a company which in circumstances of time pressure and huge uncertainty requires making critical decisions according to Rosenthal and Cahrls (1989, 15). According to Fink (2002, 32) the turning point is not necessarily fulfilled with unimproved negativity but it is characterized with some level of risk and uncertainty. The event of serious critical situation, according to Slatter and Lovett (2011, 71) does not happen over the night. The company affected by the crisis passes a few phases. Depending on the company, some phases can last very long while others are short.

In the beginning phase, management is not aware of existing crisis due to the lack of appropriate financial control and informal systems that follow unexpected events all around. Most commonly, the company is satisfied, or it can be even arrogant when it comes to company's ability and market position. At the moment when the crisis becomes visible, managers start to search for reasons to support their unstable attitude that the crisis was still far away. The company believes that disorders are results of changes implemented by a company (new products, new technology, etc.) or short term pressures such as currency fluctuations, economic recession etc. Actually, it is about denial of crisis existence as well as denial of necessity of changes. The reason to deny can be found in a hidden need of management to stay at the same position. Being aware that the owners will blame them for crisis, they are trying to amortize the effect of crisis

as long as possible. As a crisis deepens the disintegration of organization sets on scene. (Omerčević, Kulović). Before, companies did not fail because of big crisis and the crisis management was not reasonable. Prior to 1966, it was really rare case for the company to fail which changed in 1970 and from 1978, company bankruptcy became common. Besides WorldCom with assets worth 103,9 billion USD and Enron with assets worth 63,4 billion USD, in 2002 in USA, the bankruptcy was declared by Conoco with assets worth 61,4 billion USD, Global Crossing with assets worth 30,2 billion USD and UAL with assets worth 25,2 billion USD. (Sajter, 2008, 129) Muratović (2006) quotes that of total number of companies that solve the crisis, 70 % of them did it with better management, 15% with changes in economy, 5% with changes in program, 5% with help of other organizations and the last 5% with different reasons. Buccino&Associates (Altman, 1993, 3-18), in survey of 1335 answers, came to the result that in 87% , failure was caused by internal factors and three main internal factors mentioned were: (1) inefficient management, (2) low capitalization and (3) too high debt. The rest 13% in survey conducted by Buccino&Associates, were external factors including: (1) economic conditions, (2) industry weakness, (3) employee issues (4) legal reasons.

Bibeault (1998,145) quotes that according to the survey conducted by him, 44% of companies engage new management while 56% keep the previous management which is shown in the table below.

Table 1. Percent of engaging a new management out and in the company

	Inside	Outside	Total
«New» management	39	61	73
«Existing» Management	100	44	27
Total	56	44	100

Source: Bibeault, 1998,145

Detailed access to results shown in table 1. show the fact that in the situation of crisis, management was changed in high 73% of cases while management was kept in 23%. (Bibeaults, 1998, 145).

Falcon (2007, 3) while analyzing this research concluded that companies do not have enough of own capital and it is first and the most important factor that affects the failure of a company. These are facts proven with empirical research. In the company, it is needed to have a suitable amount of own capital in comparison to total capital and competent management with experts and support people who know, will and can. These are preconditions for survival. So, the results of the research show that in 60-80% of critical cases, the real source and cause of crisis is the lack of main competencies of managers. After presenting the results of the research, we can conclude that their results differ a lot (for example, the lack of main competencies of manager which is the main cause for ones, for others, it is not even a category in research). The combination of effect of many factors does not necessarily have financial character, but it is clear that all types of business crisis have the effect of financial function disorder.

METHODOLOGY

The essence of this research is based on the need that through elaboration of empirical research synthesize the means of crisis state in small and medium companies operating in wood industry, as well as style and methodology of operating the business having a crisis, but all in order to find out which role strategic management actually has in a function of solving the crisis. Through empirical research, we tried to determine the situational analysis of the current condition in which the companies are. The purpose of the research is identification of key areas of external and internal analysis of a company affected by the crisis in order to understand and overcome it. For the needs of this research which had the aim of collecting suitable information related to the

problem of operating, we created the survey named „Managing crisis situation“ and the research was done on the sample of the companies from wood industry in BiH. As a subsample, we have used companies of different sizes that do not belong to wood industry in BiH primarily for the reason to determine if there are certain similarities in managing companies and whether they manifest the same or similar disproportion in business. Pre-defined endogenous and exogenous variables were measured by means of metrics that express the attitudes of the respondents through which the respondents expressed their agreement or disagreement through the Likert scale of 5 levels. We have taken measurements from the bibliography that are related to the subject of this paper and as such they are not (or have been slightly modified) and did not change the structure and method of research as well as the value and validity of the obtained results. The research was done through the survey which consisted of questionnaires in a way to answer using the Likert measuring scale with five answers 1 = I completely disagree, 5 = I completely agree. We analyzed the results of the survey using the statistical methods. After we did theoretical elaboration of a problem, we did research part of the work. Through the process of research, the method of collecting the primary data was done by direct (personal) interview through filling out the survey by top management of surveyed companies and this method had the dominant role. One (smaller) part of questions in a survey was closed type which meant that respondents had to choose one or more offered answers while dominant (bigger) part of the survey consisted of questions with intensity offered answers, actually Likert measuring scale with answers 1-5 was used.

Since during the survey, some of survey interviewers were present, in the end, we collected 163 valid surveys which could be interpreted and analyzed. This makes 81,5% of completed surveys which is in comparison to results prior to this, very good result. From total of 329 companies operating in wood industry, 243 of them submitted the ending balance statements which created a base for our research. When choosing samples, we used AFIP data (Agency for mediating, IT and financial operations). Based on this, we made selection of companies that fit the sample which is shown in the table.

Table 2. Size of company according to number of employees criteria

Size of Company	Number of Company	%
Micro enterprises	66	40,5
Small enterprises	79	48,5
Midium enterprises	15	9,2
Big enterprises	3	1,8

Source: Authors

In the sample, there were 79 companies (48,5%) which according to the number of employees were classified as small enterprises, 66 enterprises (40,5%) which are classified as micro enterprises, 15 (9,2%) classified as medium enterprises and finally 3 (1,8%) classified as big enterprises. Just as in other researches, we also had some limitations that represented barriers at certain moments so we had to improvise in some cases in order to get true and reliable information. The methodology of research required elaboration of limitations in specific phases

that affected final analysis and conclusions. The complexity of limitations in certain phases limited the research so we can divide these limitations into less and more complex.

RESULTS AND DISCUSSION

Changes that occur in the environment represent one of the factors that companies notice pretty late. If you notice changes later, it is more difficult to react on them. However, what makes a particular type of problem is the fact that managers in general do not explain the causes and consequences and are not even aware of the extent to which changes in the environment affect the company's performance. The first of the symptoms indicating latent forms of crisis is the stagnation or the decline in turnover which, consequently results in a fall in revenues. Such situations in the books are described as latent forms of crisis. Only big companies (with the turnover over 10 000 000,00 KM) own certain instruments of strategic management and that is the reason why we can evident the increased turnover. In micro and small companies, it is notable that there are no bigger volatilities because the turnover in micro companies was increased by little extent while in small companies, the turnover was decreased in a given period of time and small companies were transformed into micro companies (according to the turnover of these companies, we do not have bigger changes because total turnover in whole sector does not represent meaningful shifts). This state can be seen as a period of stagnation. Based on these data, we can conclude that micro, small and medium companies have constant stagnation of turnover globally, which means that the increase is stopped and gradually the turnover is decreasing. On the other side, big companies (companies that have a turnover over 10 000 000,00 KM) note constant increase in revenue which shows elements of strategic management and recognizing opportunities and threats through the system that shows early symptoms of crisis. That condition reflects the data related to this position, actually the state of furniture industry. Namely, in the next table, it is shown a summary of the results of the research based on the testimonies of the respondents according to the seven key test areas.

Table 3. Summary of the results of the research based on the testimonies of the respondents

Statement	He does not agree	Somewhat agrees	Neither does not agree nor disagree	Somewhat agrees	It's perfectly compliant
Furniture industry position	2.5	8	21.5	36.2	31.9
Risk and uncertainty level of a company	0	4.9	21.5	37.4	36.2
Survival of a company as a challenge	4.3	6.1	17.8	32.5	39.3
Operating or strategic choice of managers	6.2	2.5	32.7	46.9	15.5
The importance of strategic and operating influence	0	3.2	39.6	27.3	29.9
Operational	0	0.8	29.4	31.7	38.1
Possession of own models (software)	13.6	8.6	30.2	30.9	16.7
Solving the crisis before the previous preparation	6.3	15.1	44	16.4	18.2

Source: Authors

Based on these results, we can conclude that 68,1% of surveyed companies to some extent agree or completely agree that the furniture industry is in difficult position while on the other side only 10,5% of the companies agree to some extent or completely disagrees with this statement. It is

important to mention that 21,5% of the companies has neutral (unclear) attitude related to this issue and they do not refuse or accept the statement that the furniture industry is in difficult position (due to internal or external reasons). While analyzing the state of furniture industry, we tested the risk and uncertainty brought by surroundings. Only 4,9% of surveyed managers believes that environment is not so risky (which suits the percentage of big companies operating in this sector and use elements of strategic management) but on the other side 73,6% of companies believes that environment is characterized by high degree of risk and uncertainty. Results of the research are interpreted and presented in the next graph. Risk by definition presents uncertainty which can have ambivalent result. That result can be failure or success. Entrepreneurs are prone to taking risks in order to meet the set goals of the company. Here we have a crucial question of what extent of risk is desirable to be successful. On the other hand, this is also the most difficult question because it comes across a range of problematic issues that are not usually enough to provide information and can, as such, pose an inordinate barrier to the enterprise and with the disregard of that obstacle the company will threaten to incur (to do so) in a crisis situation. Such risks in the literature are identified as significant risks and their characteristic is to have a negative impact on the property and financial structure of the company. Often, certain authors create a link or equalize such types of risks with risks that permanently endanger the survival of a company, or seriously threaten to maintain business continuity.

Most companies have stagnation or small decrease of turnover while managers believe that the market in which these companies operate is uncertain and very turbulent and that the position of the furniture industry in particular is not in envious position. Most of survey participants see the reasons of this in external factors (grey economy, unregulated market, black market, etc.) and that is why the managing business with primary goal of survival on the market represents a challenge and not a chance for success.

Only 10,4% of surveyed managers do not agree completely or partially that the biggest challenge of their companies is survival on the market but they see their opportunity in these turbulent circumstances. On the other side, we have a situation in which 71,8% managers believe that survival (not the continuous growth and development that leads towards use of strategic potential and meeting long term objectives) is their biggest challenge. Only 17,8 % of managers believe that it is one of the basic challenges but not necessarily the most important challenge for the company. By testing the awareness of importance of internal and external analysis, we got shocking results in which only 46,9% managers partially agrees and 15,5% (this percentage suits the number of companies that use elements of strategic management) completely agrees with the statements that weekly and monthly analysis of business environment is important and necessary and plays important role in managing the company while on the other side 8,7% believes that these stated analyses are not needed and 32,7% managers agrees that sometimes these analyses are need and sometimes they are not needed which means they do not have analysis continuously only in some extreme cases. These defending results are telling us that only 15,5% of surveyed companies permanently do analyzing of internal and external environments of companies while 84,5% does it irregularly. This information clearly indicates the lack of strategic thinking within these companies, and this is indicative of the fact that companies that focus on operational (and most of them) are solving problems when they become visible or when they come to an acute stage.

Referential authors in the field of management, especially in the field of strategic management (eg I. Ansoff, B. Nanus, J. Kotter, K. Ohmae, J.A. Young and others) point out that nothing is more simple. Nothing is stable. The business environment is changing in front of our eyes: quickly, radically, dramatically, and astonishingly. Now, whatever we do is not enough. New competition, new technology and new lifestyle require a whole new management. The moment of incrementalism is the past. Now, not only do we have to adjust and make, but we have to make

changes - big changes - and that very quickly. Everything is under a question mark. Old management, organizational structures, traditional planning and control just do not work. Everything has to change. Not only the work of a manager, but also their knowledge or habits, must be improved.

Effective and efficient managers are supposed to have previously defined strategic objectives and ways to meet these objectives. Nevertheless, in practice, it is not the case. Namely, relevant research shows operational management as not only the dominant one but the only type of managing the business. Management relies dominantly on the past and inside information of the company. Within its whole activity, assignments and instruments of operating management are dominant which shows that companies are more ready and directed towards operating crisis and less towards the strategic crisis. It is related to one specific problem created by the lack of strategic thinking and strategic behavior based on strategic management as a proven concept for efficient and effective managing of the crisis, not only in critical period but also before and after the crisis. There is a high level of agreement of referential authors from this field that the company falls into crisis due to mismanagement. Namely, every type of crisis can, with its negative synergy and management disorientation, create chaos and potential disaster but also it can be an inspiration, to motivate creativity and challenge in creating completely new access, solutions and initiatives. Such process actively affects the change in attitude, the way of thinking, behavior and awareness of people especially managers which are the most responsible for efficient managing. There are many meaningful examples in history where in some sectors that were hit by the crisis and some of companies disappeared while others could handle all the challenges and nowadays they are operating better than before the crisis.

The results of the survey bring the perspective in which none of managers believe that strategic and operating action is not important. Namely, only small percent of managers (3,2%) believes that strategic actions are not completely unimportant in comparison to 0,8% managers who believe it for operating action. It is already clear that a small primacy is still important when it comes to the importance of operative action. Further, data tell us that 39.6% of managers consider strategic activity as moderately important compared to 29.4% of managers who likewise consider operative action. The data from this part of the survey actually speaks of the fact that there is one mix of instruments used in managing a company, and it also includes strategic and operational instruments. Looking at the relationship between the two most important parts of the ladder that has the data provided by managers who fully or partially agree with the importance of action, we see that 27.3% of managers see strategic action as important as compared to 31.7% of managers who also think of operational while 29.9% of managers see strategic action as extremely important compared to 38.1% of managers who see operational impact as extremely important. To investigate and determine which of these two approaches really have a higher primacy, we have conducted research into how often they are used and to what extent software solutions or software packages are managed by the company. Data we got from that part of the research are telling us that 13,6% of the companies does not have its models which are specifically developed for controlling all parameters in company while 8,6% of the company has certain models that follow only specific parameters. 30,2% of the companies admitted that they have the same numbers of parameters they follow like the number of parameters they do not follow which shows us dominant operating managing of business because only parameters crucial for business realization are controlled and tested. Results from the bottom line clearly show that 30,9% of tested companies owns certain models that control larger number of parameters (besides operating, they are following specific strategic indicators) while only 16,7% of the companies has specialized models that control all the needed parameters of the company. The last percentage of the company use model of strategic thinking and operating action in continuous process of managing the company which suits parameters of earlier research. In the

end, we can conclude that there is a lack of awareness of the importance of strategic management together with operating management and that the lack of strategic access is a consequence of insufficient competence of top management, more precisely, their inadequate knowledge of managing the business. The importance of strategic management is not diminished by anybody and it is dominant in big companies that are export oriented but the problem exists in small and medium companies due to the failure to use strategic access. In the end, we can make conclusion that most tested companies give advantage to operating actions in comparison to strategic managing.

In order to identify factors that determine strategic of overcoming the crisis, it is necessary the situation and the condition of the company in furniture industry so it might be possible to answer the question why all tested companies are in certain state of crisis and/or business success. In the previous we presented the data related to income levels as well as data that show how managers perceive environment and how they see the opportunities and threats found in environment in which the company operates. Using the presented results, we concluded that in most companies, elements of operating management are dominant as well as the mechanisms for overcoming the critical situations using the operations actions. In the conditions in which we have a business crisis, there are many strategies of which two are crucial: 1) strategy of consolidation and regeneration and 2) strategy of leaving the business. When it comes to these strategies, it is necessary to emphasize that it is not about „some finished products“ which we need to chose but they need to be created using the capacities of a company and in accordance to environments in which the company operates as well as opportunities/threats which will present the main challenges of the company in the future.

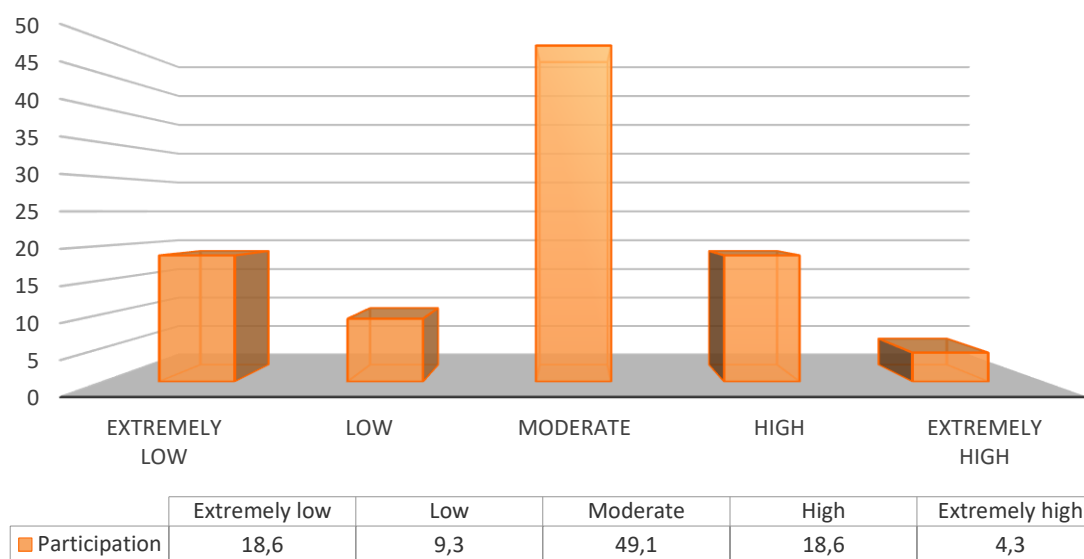
Strategy of consolidation and regeneration is used when current position of a company is not satisfactory, when the company is not stable and it is necessary to take prompt actions to change the current conditions. This strategy is focused to survival of the company in key business activities through the increase of its competitiveness. Observing what the company can do in short period of time, we can see that the most important fields for consolidation are increasing the revenue while decreasing the costs ate same time and parallel with it, it is necessary to reduce assets owned by company (Buble, Ed., 2005, 121-122). In comparison to the previous strategy, strategy of liquidations of the company appears when its sale is not ratial choice or when it is impossible to sell the company. The aim of this strategy is minimizing the damage as much as possible. This is at the same time the least popular strategy and is used when all other strategies fail. Nevertheless, in some cases, using the system fail, it is possible to make higher cash flow in comparison to market value before the closing of the company. (Pearce, Robinson, 1982, 201).

In this work, based on the results of research, we found out that meaningful percent of managers, 27,9% believes that their companies are not well prepared to potential crisis, while 49,1% of managers thinks that they are moderately ready for crisis; they are in some sort of „vakuum“. These companies have certain financial stability for some eventual critical action but these companies can be viewed the same like the first ones that are extremely low prepared for critical situations because they do not have any crisis plans they can use. In comparison to previous two categories 22,9% of managers believes that they are well or extremely well prepared for eventual critical situations.

After we tested the level of readiness to crisis, we determined what percent of companies is willing to solve the crisis without the previous plan and preparation. Results we got showed that 34,6% of surveyed companies access these situations without previous preparations while 44% of the companies is making some kind of preparation but these preparations are not detailed. Only 21,4% of companies make detailed preparation prior to solving the crisis. This shows us

clearly that in surveyed companies, operation management is primary so the mechanisms used for overcoming the crisis suit operational actions completely.

Graph 1. The level of readiness to crisis within a company



Source: Authors

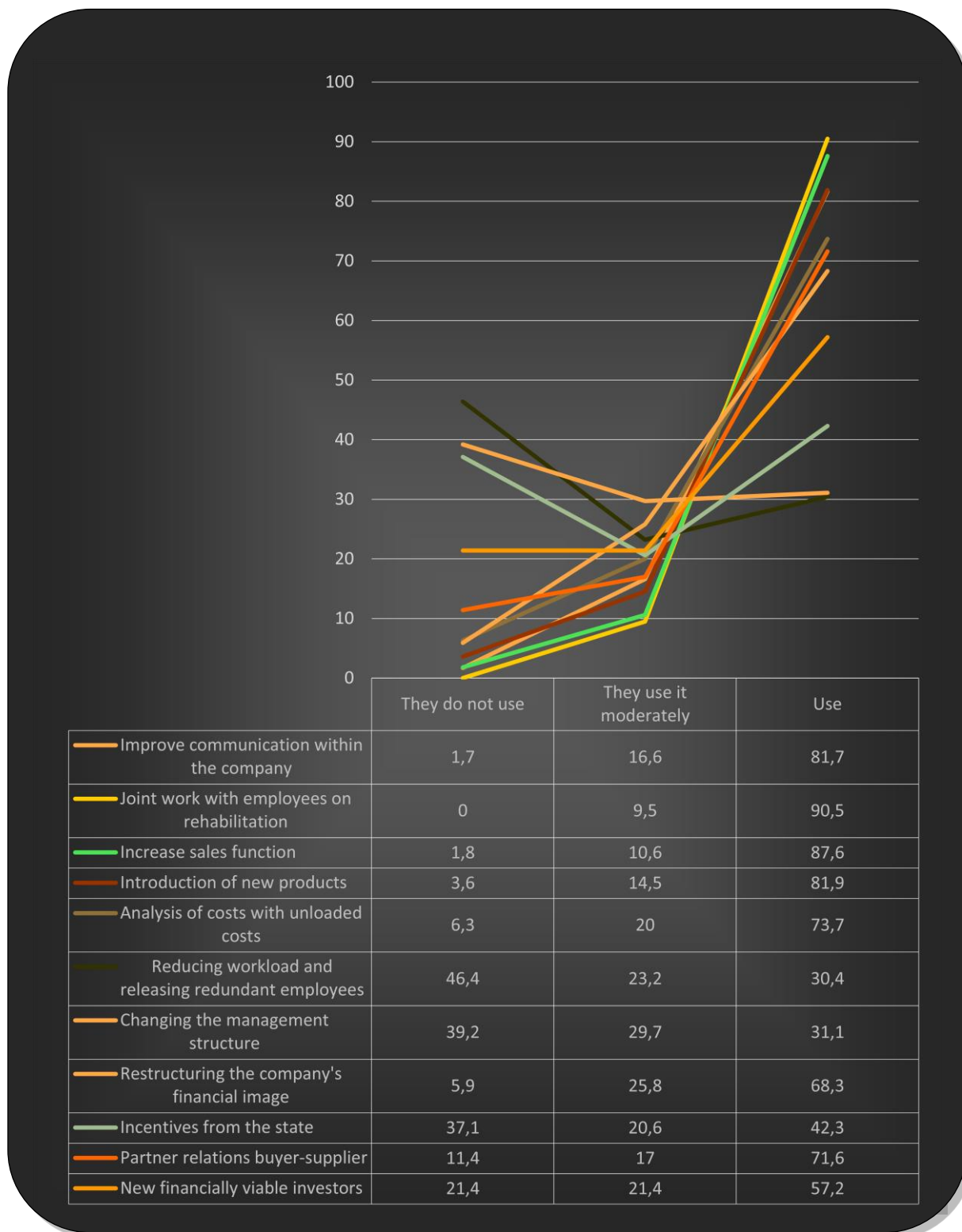
During the overcoming the crisis, the highest importance is given to team work together with employees to solve the problem that happened in the company (90,5% of activity use), after that, we have improving the sales with 87,6% of use, having new products with 81,9% of activity use, improving communication inside the company with 81,7% of activity use and detailed analysis of costs while discarding the costs that are not justified at that moment with 73,7% of activity use. The least used activities in overcoming the crisis are decrease in business activity, employee dismiss with 46,4% of managers who do not use these activities and changing management structure that is not acceptable for 39,2% of managers. Also, seeking the government support (37,1%), searching for financially strong investors (21,4%) are two activities that managers, companies rarely use in order to overcome situations of crisis. In the end of this part of the work, we can conclude that companies use certain type of restructuring as the way to exit the crisis but it does not represent methodology to solve the crisis. Strategic access is of extreme importance to overcome strategic situations and through the research we could see that there is awareness of its importance but through the research, we found out that due to incompetence of managers, they consciously block the use of such access.

CONCLUSION

In this paper, we have investigated how the managers of the observed companies value-perceive performance indicators. In the process of observing the involvement of the crisis, we concluded that lethargy with the absence of a strategic management administration led most of the company into a state-of-the-form latent crisis. However, when we conducted survey in the number of companies that believe that in the past five years (5) years it was not in any of the stages of the crisis, we have come to the conclusion that as much as 31.3% of managers absolutely believe that none of its part of the business was in any form of the crisis in the last five years. The five-year period is not a small time interval and we did not accidentally set it up in the research survey, especially if it is known that the 2008/09 world-economic crisis was accompanied by a decline in economic activity. It is evident that all companies had a certain growth and development over

the past period. Certainly crisis situations can happen in such circumstances, that is when the company grows.

Graph 2. The importance of situations in overcoming the crisis



Source: Authors

The most characteristic form of the crisis that is then emerging manifests itself in the form of increased orders that the company is not able to properly service. Therefore, in the period of development of the company, strategic orientation towards gradual development is very

important. Although there is a high level of awareness that the time for strategic orientation in the business is out of use, and hence the fears of crisis, or the failure to recognize the crisis as a chance. On the other hand, operational management has no delinquent reach and can not foresee trends in the future, but only work in the present to realize pre-defined tasks from the past. The overall picture of the observed companies clearly indicates that most of the companies (with an 80% to 90% enterprise percentage) are constantly in some form of crisis. Assuming such a state through research, we have tried to determine how the managers of the observed enterprises function. The results of the research clearly showed us the dominant operational approach to enterprise management. As part of this, when we were able to explore the significance of the competence of management for survival, growth and development of the company, we obtained the results from which the conclusion is drawn that the brave and aggressive attitude of management is extremely important in order to take advantage of potential opportunities.

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THE IMPORTANCE OF EMPLOYEES' PERFORMANCE MANAGEMENT IN THE ORGANIZATIONS IN SERBIA

Nemanja Berber¹, Agneš Slavić²

Abstract: Human resource management (HRM) can be understood as a managerial process of managing one of the organizations' most valuable resources – people. Among many interrelated activities, such as HR planning, recruitment and selection, orientation, training and development, career management, remuneration - compensation and benefits, retaining, health and safety, industrial relations, etc., performance management gets special place in HRM, but also in the organization as a whole. Performance management can be described as a strategic and integrated approach to delivering success to an organization focusing on the improvement of performance and employee development. Employees' performance management (PM) includes all the elements relevant to the performance of the organizations employees. The evaluation of the results of employees' work represents an assessment of their current or previous performance. This implies the need for work standards to be set together with employees, in line with the goals of the organization, the further set of mutually measurable objectives, then comparing the achieved results with the set standards, discussing with the employees the achieved results in order to timely correct the worker's activity. Since it is an integrated process, PM provides information for other HR activities, too such as career management, training and development, and compensation (incentive pay) decisions. Based on the above mentioned, the aim of this paper was to explore the current state of the employees' performance management practice in the context of human resource management (HRM) in Serbia. The objectives of the study were to detect the extent of the usage of formal assessment procedures for performance measurement for different types of employees, the extent of the usage of appraisal data as an input for other HR activities, and to detect who is formally expected to provide data for the appraisal process. Also, there has been investigated the relationship between performance management practice and organizational performances. The methodology in this paper includes the theoretical analysis of the employees' performance management, as well as the statistical analysis of the data on employees' PM in Serbia, based on the Cranet research. The sample of the study has consisted of 160 organizations from Serbia, explored in 2015/2016 period. We used descriptive statistics and correlation test for the purpose of the analysis in the SPSS program.

Keywords: Human resource management, Performance appraisal, Serbia, Cranet

JEL Classification: M12, M50

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INTRODUCTION

Human resource management (HRM) can be understood as a managerial process of managing one of the organizations' most valuable resources – people, employees, containing several interrelated activities. Those activities or practices are HR planning, recruitment and selection, orientation, training and development, performance management, career management, remuneration - compensation and benefits, retaining, health and safety, industrial relations, etc. (Cascio, 1998; Byars & Rue, 2004; Paauwe & Boselie, 2005; Armstrong, 2009; Štangel Šušnjar et al., 2017). HRM has several objectives, and one of them is to direct employees' efforts and work towards organizational goals, and making possible for employees to develop themselves and reach their own goals, in the same time.

Among HRM processes, one of the most interesting and important practice is the performance management (Boswell & Boudreau, 2002; Roberts, 2003; Judge & Ferris, 1993; Kuvaas, 2006;), which can be described as a strategic and integrated approach of delivering success to an organization that focuses on improving performance and employee development. Employees' performance management (PM) represents an assessment of their current or previous performance. This implies the need for work standards to be set together with employees, in the line with the goals of the organization, the further set of mutually measurable objectives, then comparing the achieved results with the set standards-performance appraisal, discussing it with the employees in order to timely correct worker's activities.

The aim of this paper is to explore the actual state of the employees' performance management practice in the context of human resource management (HRM) in Serbia. The objectives of the study are to detect the extent of the usage of formal assessment procedures for performance measurement for different types of employees, the extent of the usage of appraisal data as an input for other HR activities, and to detect who is formally expected to provide data for the appraisal process. The methodology in this paper includes the theoretical analysis of the employees' performance management, as well as the statistical analysis of the data on employees PM in Serbia, based on the Cranet research.

LITERATURE REVIEW

Performance management (PM) is a systematic process for improving organizational performance by improving the performance of individuals and teams. This is a way to get better results by understanding and managing performance within the planned goals, standards and required competencies (Armstrong, 2009, p. 9). "Performance management systems begin with performance appraisal as a jumping-off point, and then focus on improving individual performance in a way that is consistent with strategic goals and with the ultimate goal of improving firm performance" (DeNisi & Murphy, 2017, p. 421). However, performance management contributes to achieving a culture change and is integrated with other key HRM activities.

As an important part of the high-performance working system (HPWS), PM contributes to the development of more efficient work systems that largely determine the level of performance (Armstrong, 2009, p. 10). Performance management is aimed at making different HRM decisions related to promotions and career development, layoffs/dismissals, increases in compensation and benefits, and employee training (Byars & Rue, 2004; Slavić et al., 2014, Štangel Šušnjar et al., 2017), with the purpose of improving the way employees contribute to the organization's goals and job performance (Dusterhoff et al., 2014).

Regarding the evaluation of the results of the work, a very important question is who should evaluate it? There are different possibilities. If it is done by a *supervisor*, this may have its advantages given that it is well acquainted with the job and results of the work of its entrusted

employees, but, on the other hand, the supervisor can, because of his subjectivity, assess the performance of his employees better or worse than they are. Supervisor ratings are the most frequently used measure of worker contribution (Rosen et al., 2017). Evaluations can be done by *colleagues/peers* because there are tasks that supervisors can hardly monitor. In order to avoid subjectivity in the assessment, a well-defined assessment procedure needs to be made and ensure that one employee is evaluated by more of his colleagues. The work of the superiors can be judged by their *subordinates*. They evaluate his communication skills, the way he delegates the work, his management style, the planning and organization of the work, and other leadership abilities of their superior. In assessing this, it is important to guarantee the anonymity of the evaluators in order to make these assessments objective. There is also a form of *self-assessment*, when employees are involved in evaluating their own work results, with the aim of reducing the degree of repulsion to the evaluation process. However, in this assessment, it is often possible to obtain a lenient and subjective evaluation. Evaluation can also be performed by *consumers/clients*. It is about evaluating those employees who are in direct contact with consumers. The main criterion for evaluating the work of employees is consumer behaviour and readiness to respect their objections, which leads to greater customer satisfaction, improves the image and performance of the company. Finally, evaluating results can also be done with the help of a *computer*. This type of evaluation is the most objective, and it takes place continuously (Cascio, 1998, p. 316-317).

The evaluation of the results of the work should regularly but not too often or rarely because then the evaluators do not remember the results of the work that the worker had achieved in the previous period. It is recommended to assess employees' performances two or three times annually (Byars & Rue, 2004, p. 251), with managers monitoring the performance of their associates throughout the year, and getting feedback on the results achieved several times a year. The role of the HR department in this process is to participate in the proposition of the evaluation policy, to organize trainings for managers to evaluate the performance of employees and to control the system of evaluating.

The entire process of PM, tracking all the steps and the application of different methods do not always yield good results. It is also evident that there are various potential mistakes that can occur in the process of assessment. It is therefore important to make efforts for the PM process to be really objective and consistent with the corporate strategy (Štangel Šušnjar et al., 2017). PM systems are more likely to influence firm performance when they are:

- “Integrated with other HR practices so that they together form a broader view of what constitutes a PMS;
- Consistently aligned with the achievement of the firm's strategic goals;
- Focused on behaviours that are under the control of employees;
- Focused on behaviours that employees can see as related to the achievement of strategic goals;
- Work together to form a “strong” PMS” (DeNisi & Smith, 2014, p. 147).

Also, in order to make employee PM successful, the characteristics of the job which are essential for success (based on the design of the job) should be identified and included in the system. Then, all stakeholders (managers, supervisors, employees themselves) should be included in the evaluation process, in order to get familiar with this system and through it build the confidence of employees in the process of evaluation. On the contrary this system can be harmful to the company, according to Marcus Buckingham and Ashley Goodall (2015), in terms that the PM approach “drives neither employee engagement nor high performances”.

One of the most famous methods for employee PM is a multilateral evaluation or 360⁰ feedback (Campion et al., 2015; DeNisi & Murphy, 2017). It refers to the practice of anonymous ratings

and narrative comments on the job performance and behaviours of the employee from a wide range of others who have worked with the employee (peers, subordinates, other managers, customers, immediate supervisor and self-ratings) (Campion et al., 2015). The usual process of multilateral evaluation today involves the electronic filing of the questionnaire. The computerized system creates all the feedback in the individualized form of the report to the one who was evaluated. When an employee receives his assessments, he or she can create a development plan and upgrade for the next period. This type of performance assessment is used more for employee development than rewarding (Dessler, 2013, p. 289).

The benefits of this method for assessing performance are greater involvement of all employees in the development goals of the organization, creating constructive feedback, improving communication over time, and greater flexibility of the organization (Torrington et al., 2008, p. 310). Also, this method is useful for an individual because it contributes to a better understanding of the possibilities of his development because the information is more realistic and is influenced by a greater number of evaluators (Campion et al., 2015). One of the special advantages of this method is that it affects the employee's commitment, builds up a better relationship with clients, and the development of teamwork (McCarthy & Garavan, 2001, p. 13-14). Also, the 360-degree feedback leads to the organizational justice, aids in sustaining justice, and making justice an integral part of the organizational culture (Karkoulian et al., 2016).

On the other hand, the disadvantages of multilateral evaluation relate to the potential fear of employees, because sometimes this kind of evaluation can be negative and affect demotivation. Also, due to the participation of a larger number of evaluators, the scope of the assessment work is multiplied; it is long lasting and can be imprecise. Evaluators can be unskilled, they can assess on the basis of previous experience and the complexity of the administration of the entire process increases (McCarthy & Garavan, 2001, p. 14-15). For example, Deloitte is developing new PM approach, leaving 360-degree behind, that “separates compensation decisions from day-to-day performance management, produces better insight through quarterly or per-project “performance snapshots,” and relies on weekly check-ins with managers to keep performance on course” (Buckingham & Goodall, 2015, p. 43).

METHODOLOGY

In order to investigate the practice of employees' performance appraisal in Serbia, we used a sample of 160 Serbian companies. Data was collected by the Cranet questionnaire. The Cranet survey is the largest and most representative independent survey of HRM policies and practices in the world. The survey is conducted approximately every four years in over 40 countries of the world (Brewster et al., 2011; Berber et al., 2017). The aim of the research is to provide high-quality data for the purposes of academic, public and private sectors, as well as for students of HRM, and to create new knowledge about HRM practices in different countries of the world. The questionnaire was divided into six parts/sections: HRM activities in an organization, staffing, employee development, compensation and benefits, industrial relations and communication, and organizational details (Parry et al., 2013).

As the only member of this international scientific network from Serbia, in 2008, for the first time, Faculty of Economics in Subotica, University of Novi Sad, participated in an international study on HRM activities with 50 analysed organizations. In the first half of 2015, 160 organizations from the territory of Serbia were investigated. Answers to questionnaires were provided by executive managers or HR managers in organizations with more than 50 employees (Berber et al., 2018). For the purposes of this research, the following variables have been analysed: the extent of the usage of a formal appraisal system for different types of employees, the extent of the usage of different types of evaluators in the appraisal process, the extent of the

usage of appraisal data for different HRM activities, and the level of organizational performances.

Sample

The data from Table 1 indicate that the largest share of analysed organizations in Serbia was in the group of SMEs (60.6% of organizations), according to the number of employees. Large companies (over 250 workers in the organization) made about around 27%, while very large enterprises, over 1000 workers, made up 13% of the sample.

Table 1. The size of the organizations

Organization size (by number of employees)	Frequency	%
1-249	97	60.6
250-1000	42	26.3
1000+	21	13.1
Total	160	100.0

Source: Authors' analysis based on Cranet data.

The data from Table 2 indicate that the largest share of analysed organizations in Serbia belong to the private sector, 66%, while public sector makes 34% of the sample.

Table 2. The ownership structure of organizations

Ownership	Frequency	%
Private	105	66
Public	54	34
Mixed	0	0
Other	0	0
Total	159	99.4
Missing	1	0.6
Total	160	100

Source: Authors' analysis based on Cranet data.

45% of enterprises are engaged in production, while around 55% of organizations are in the service sector. The largest share of organizations from the sample is from food, trade, telecommunications and IT sectors.

RESULTS AND DISCUSSION

From Figure 1 it is obvious that the majority of the explored Serbian organizations use formal assessment for managers, professional workers, clericals and manual workers. This means that more than 70% of organizations in Serbia have a formalized process for performance appraisal of their employees. In the case of professionals and clerical/manual workers these percentages are even higher, 78% and 73,4%, respectively.

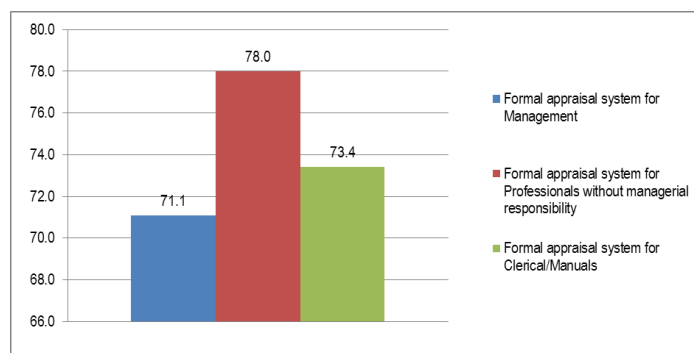


Figure 1: The extent of the usage of formal appraisal for different types of employees (%)

Source: Authors' analysis based on Cranet data

The data from Figure 2 show the evaluators of performances of managers in Serbian organizations. The immediate supervisor is used mostly in case of the explored Serbian organizations as an evaluator of managerial performances (about 47% of organizations in Serbia). Then, supervisor’s superior is the second mostly used evaluator (35%), then the employee by himself/herself (20%), while the subordinates and peers are used in only about 10% of the organizations.

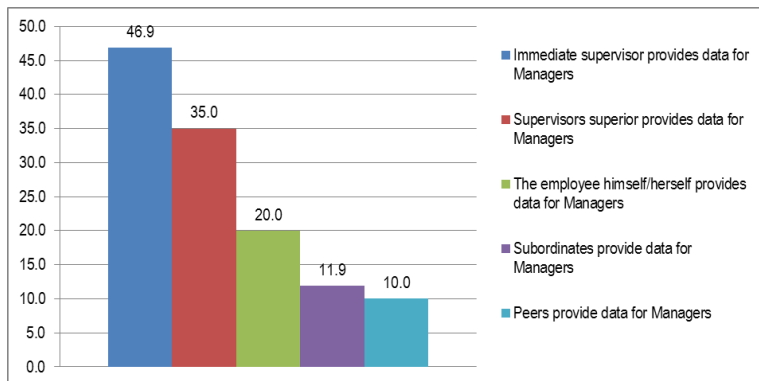


Figure 2: The extent of the usage of different evaluators in the managerial appraisal (%)
 Source: Authors’ analysis based on Cranet data

Similarly, the data from figure 3 and figure 4 show the evaluators of the performances of professionals and clericals and manuals in Serbian organizations.

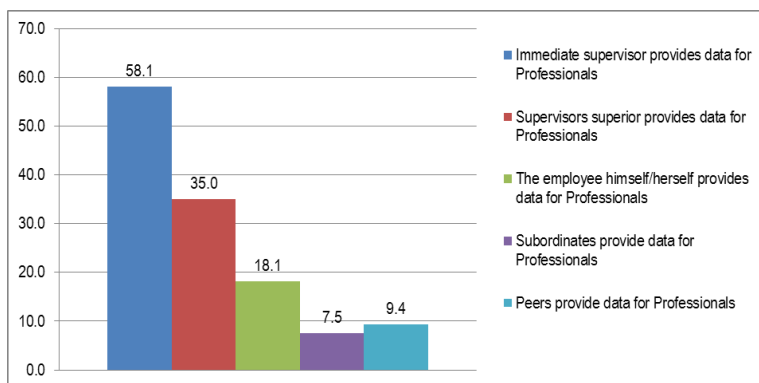


Figure 3: The extent of the usage of different evaluators in professional’s appraisal (%)
 Source: Authors’ analysis based on Cranet data

The immediate supervisor is again the mostly used in the case of explored Serbian organizations as the evaluator of employees’ performances (about 57% of organizations in Serbia). Then the supervisor’s superior is the second mostly used evaluator (in 35% of organizations for professionals and in 28% for clericals), then the employee by himself/herself (in 18% of organizations for professionals and in 13% for clericals), while the subordinates and peers are used in less than 10% of organizations.

The last, Figure 5 presents the extent of the usage of appraisal data for other HR decisions and practices. The data show that more than half of all observed organizations use appraisal data for other HR decisions. Appraisal results are used mostly for pay decisions (71% of organizations), career development (69%), training and development (68,6%), and HR planning (60,5%).

At the end of the empirical part of the paper, the authors performed Spearman’s correlation in order to test the relationships between PA and organizational performances (level of productivity, level of service quality, and level of profitability – all three variables have values from 1 to 5).

For the purpose of the analysis, there were created two new variables, *Formal PA* and *PA for HRM*. *Formal PA* variable consists of three questions about the usage of a formal appraisal system for managers, professionals and clerical/manual workers, as dichotomous variables. By doing this, the author created one variable with values from 0 (which means that organization does not use formal PA for any type of employees) to 3 (organization is using formal PA for all types of employees). *PA for HRM* is made in the same line with the previous variable, but here the authors summarized four variables that were presenting whether appraisal data are used for different HR practices (Figure 5). The new variable has values from 0 (organizations do not use PA data for other HR practices) to 4 (organizations use PS data for all four HR practices).

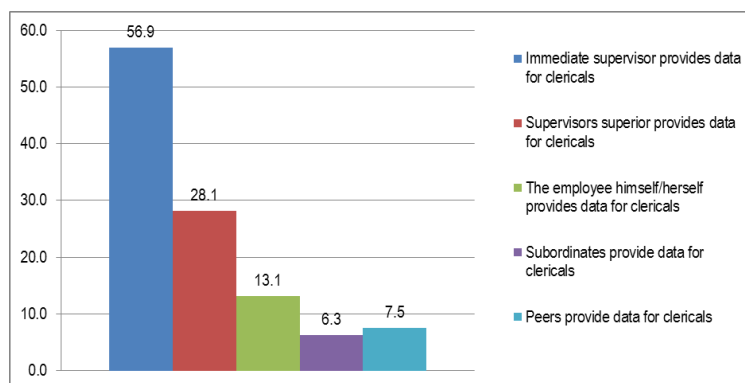


Figure 4: The extent of the usage of different evaluators in clerical/manual's appraisal (%)
Source: Authors' analysis based on Cranet data

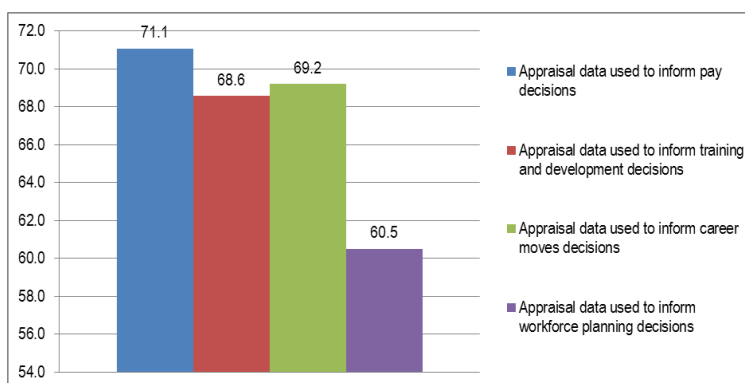


Figure 5: The extent of the usage of appraisal data for different HRM activities (%)
Source: Authors' analysis based on Cranet data

Table 3. Means, standard deviations, and correlations of observed variables

		Mean	SD	Formal PA	PA for HRM	Prod	Servqual	Profit
Formal PA	rho	2.22	1.19	1.000	,627**	,158*	,219**	,234**
PA for HRM	rho	2.70	1.59	,627**	1.000	,162*	,217**	,247**
Productivity	rho	3.58	.841	,158*	,162*	1.000	,680**	,643**
Servqual	rho	3.86	.810	,219**	,217**	,680**	1.000	,563**
Profitability	rho	3.43	.908	,234**	,247**	,643**	,563**	1.000
**. Correlation is significant at the 0.01 level (2-tailed).								
*. Correlation is significant at the 0.05 level (2-tailed).								

Source: Authors' analysis based on Cranet data

According to the data from Table 3, it can be concluded that there is a strong statistically significant positive correlation between Formal PA and PA for HRM (rho=0.627, p<0.001), which means that if organizations use formal PA for more types of employees they will use PA data for higher number of HR practices. There are weak statistically significant positive correlations between Formal PA and all performance outcomes (profitability (rho=0.234,

$p < 0.001$), service quality ($\rho = 0.219$, $p < 0.001$), and productivity ($\rho = 0.158$, $p < 0.05$). Also, there are detected weak statistically significant positive correlations between PA for HRM and all performance outcomes (profitability ($\rho = 0.247$, $p < 0.001$), service quality ($\rho = 0.217$, $p < 0.001$), and productivity ($\rho = 0.162$, $p < 0.05$)). A higher level of usage of PA data for other HR practices and the usage of PA for more types of employees is positively correlated with the higher level of organizational performances.

CONCLUSIONS AND RECOMMENDATIONS

Performance management is a systematic process for improving organizational performance by improving the performance of individuals and teams. It should be connected with the organizational overall strategy and the company's goals. The most of the analyzed literature pointed to the need of introducing a higher number of evaluators, from immediate supervisors, who are used most frequently, senior managers, peers, consumers, self-evaluation, to even computers. Performance appraisal should be focused on behaviours that are under the control of employees and on behaviours that are related to the achievement of strategic goals. If the PA process is underdeveloped, it can even harm organizational and individual performances, so it is very important to prepare the whole process, which implies the need for work standards to be set together with employees, in the line with the goals of the organization, the setting of mutually measurable objectives, comparing the achieved results with the set standards, and discussion about it with the employees in order to timely correct their work activities.

Based on the Cranet data gathered in Serbia in 2015 and 2016, the authors detected a statistically significant positive correlation between formalized performance appraisal used for different types of employees and the usage of PA data for HR decisions. Also, weak statistically significant positive correlations between *formal PA* and all performance outcomes and between *PA for HRM* and all performance outcomes (profitability, service quality, and productivity) were detected. The higher level of the usage of PA data for other HR practices and the usage of PA for more types of employees is positively correlated with the higher level of organizational performances.

The majority of the explored Serbian organizations use formal assessment for managers, professional workers, clericals and manual workers. Regarding the evaluators, the immediate supervisor is used mostly in case of analysed Serbian organizations as the evaluator of managerial, professional and clerical performances. The supervisor's superior is the second mostly used evaluator, then the employee by himself/herself, while the subordinates and peers are used in a small share in Serbian organizations. In the case of the usage of different elements of the PA system, more than half of all observed organizations use appraisal data for other HR decisions. Appraisal results are used mostly for pay decisions, career development, training and development, and HR planning.

According to the literature review and obtained results from the research, it can be concluded that appropriate, formally developed, and integrated PA system can help organizations and their HR managers to achieve and maintain a higher level of performances at all levels.

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THE PRELIMINARY RESEARCH OF EMPLOYER'S BRAND DEVELOPMENT AT ENTERPRISES IN SERBIA

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Abstract: *The employer brand, understood as a company's effort towards building a unique image in order to present it as a unique and desirable place to work, is used to attract, retain and motivate the talents and best employees. In order to gain the best employees, it is necessary to change the strategies and tactics of human resources management. The employer brand, created as a result of integrating marketing and human resource management discipline, is one of the innovative approaches that involve the appropriate combination of material and non-material benefits that will be delivered to employees in order to exploit their potential in a way that creates high loyalty and commitment to the company, and thus job satisfaction. In the context of human resources management, the employer brand is the package of psychological, economic, and functional benefits that potential employees associate with employment with a particular company. However, the degree of development of the employer brand is under the influence of a number of factors, where one of the factors is also the variable of the internal environment. Taking this into account, the main goal of this paper is to determine the degree of development of the employer brand on a sample of companies with different sizes, activities and capital structure which operates in Serbia. The results of the research showed that there is a partially statistically significant difference in the degree of development of the employer brand between enterprises financed by private and state capital, but also the absence of a statistically significant difference in the employer brand development between the companies of a different size and activity. The practical implications of this study are important for companies that strive to build a unique image as a desirable place to work, in order to attract and retain the best candidates from the labor market.*

Keywords: *employer brand, company image, talents, employees*

JEL Classification: *M54, J24*

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INTRODUCTION

Since human resources, i.e. their knowledge, skills, experiences and capabilities are a key factor of success and a sustainable competitive advantage of modern enterprises (Zhu et al. 2014), it is not surprising that the attraction and retention of the talents and best candidates from the labor market has become important as attracting and retaining the best consumers (Berthon et al. 2005). In order to do this, companies started applying marketing and branding principles in the field of human resources management. Developed as a result of such integration, the employer brand represents the process of building the identity and image of an enterprise as an employer, i.e. creating a unique and desirable place to work, in order to attract, retain and motivate the best employees (Srivastava and Bhatnagar, 2010).

In order to build a good and recognizable place for work, companies provide employees with numerous tangible and intangible benefits in terms of working environment, career advancement, additional knowledge, job security, earnings, respect for employee ideas, etc. (Hanin et al. 2013; Uma and Metilda, 2012; Berthon et al. 2005). However, there are many factors that can influence the degree of development of an employer brand in the company. Among the factors are the important characteristics of enterprises, such as size, activity and capital structure. The main goal of this paper is to determine the level of development of the employer brand in companies of different sizes and activities, and to determine whether private companies have a more developed employer brand than state companies. The significance of this paper is reflected in the fact that no examination of this type has been carried out so far on the territory of the Republic of Serbia, so that the theoretical and practical conclusions can be the basis of further research and provide relevant informations that can be used for practical purposes.

LITERATURE REVIEW

In addition to being one of the most important asset components of modern companies, the brand allows differentiating supply and highlighting the quality of products and services, which leads to the creation of satisfied and loyal consumers (Cascio, 2014). Although a large number of companies focus their marketing efforts on branding products and creating a corporate brand, branding principles can be applied in the human resource management domain (Alniaçik et al., 2014). As a result of such integration, the concept of an employer brand emerges (Backhaus and Tikoo, 2004; Priyadarshi, 2011; Edlinger, 2015). However, unlike classic branding, where the goal is to attract and retain consumers who will lead to high profitability of the company, the goal of the employer brand is to attract, retain and motivate the best employees and talents (Tanwar and Prasad, 2016; Urbancová and Hudáková, 2017).

The creators of the concept, Ambler and Barrow, defines the employer brand as the “package of functional, economic and psychological benefits provided by employment, and identified with the employing company” (Ambler and Barrow, 1996.) Backhaus and Tikoo employer branding defines as the “process of building an identifiable and unique employer identity”, and the employer brand as the “concept of the firm that differentiates it from its competitors” (Backhaus and Tikoo, 2004). In fact, it is internal and external, that is, communication to existing and potential employees why is the certain company different and desirable place to work (Ewing et al. 2002). The basic idea of the employer brand is to provide certain benefits that will enable attracting, retention and motivation of employees and create such a work environment in which high productivity will be achieved, which will enable the achievement of a competitive advantage (Lenaghan and Eisner, 2006; Tanwar and Prasad, 2016). In order to build a strong employer brand, it is necessary to show what is specific and different in the case of a particular company. In fact, it is about the benefits that are promised and delivered to employees, which include a large number of factors concerning working conditions, compensation, promotion

opportunities, interpersonal relationships, acquiring additional knowledge, etc (Singh and Rokade, 2014). Ambler and Barrow have identified the functional, economic and psychological benefits that can be achieved by working in an enterprise. These are the dimensions of the employer brand, which include a wide range of material and non-material benefits that employees can obtain from the employer. Berthon et al. (2005) developed EmpAt (Employer Attractiveness) scale, in which they identify five dimensions of the employer brand: interest value (interesting working environment, application of new working methods, respect for creativity of employees), social value (happy working environment, good interpersonal relations, cooperation between employees, etc), economic value (high salary, attractive compensations, promotion, job security), application value (application of acquired knowledge, ability to teach others, good treatment of employees from management) and development value (respecting employee ideas, improving and gaining experience for other jobs). As a result of creating a good working environment, which includes many elements such as competitive earnings, good interpersonal relationships, learning and career opportunities, respecting employee ideas, work-life balance, etc, the company creates a picture of a unique and recognizable place to work (App et al. 2012; Singh and Rokade, 2014).

The employer brand offers many positive effects. As a result of creating a unique place for work, the company is able to attract and retain the best candidates from the labor market, increase organizational commitment, loyalty and employee satisfaction (Sokro, 2012). From the perspective of the employee, the employer brand enables growth of self-confidence, good interpersonal relationships, acquisition of additional knowledge and easier career advancement, which leads to the growth of individual and overall performance and competitive advantage (Srivastava and Bhatnagar, 2010; Shah, 2011). At the same time, the company improves its public image and achieves better relations with the social community, as employees communicate their satisfaction to others (Joo and McLean, 2006).

There are numerous factors that influence the degree of development of the employer brand. Berthon et al. (2005) emphasize the importance of cultural differences within the company. The national culture also represents significant factor which will probably lead to a difference in the significance of certain dimensions of the employer brand (Alniaçik et al. 2014). Of course, it should be also consider other structural characteristics of a company, such as size, type of activity, capital structure etc.

When it comes to company size, Franca and Pahor (2012) have come to the conclusion that larger companies have a more developed employer brand. There is a greater chance that a person will be more likely to come into contact with a larger than with a smaller company. Consequently, the following hypothesis can be posed:

H₁: There is a statistically significant difference in the degree of development of an employer brand between enterprises of different sizes.

It can be said that the type of activity is an important factor that can influence the employer brand. In the service industry employees represent a key element of success and customer satisfaction, since the quality of the delivered services depends on their knowledge, mood, kindness and experience (Sokro, 2012; Kimpakorn and Tocquer, 2009), whereby an enterprise can more easily manage employees than consumers (Schlager et al. 2011). Knox and Freeman (2006) examining the image of the employer brand in the recruitment process concluded that there is a special significance of this concept in the service industry. The significance of the employer brand also occurs in manufacturing companies, since it facilitates the recruitment process, ensures employee satisfaction, attracting and retaining talents (Heilmann et al. 2013). Consequently, the following hypothesis can be posed:

H₂: There is a statistically significant difference in the degree of development of an employer brand between companies of different activities.

Special attention must be dedicated to the form of capital that dominates the ownership of the company. Research has shown that private companies have a more developed employer brand and consequently are more able to attract and maintain talent than public companies, since they value innovation, leadership, reward for performance and facilitate career advancement (Aggarwal, 2015; Jiang and Iles, 2011). It should also be noted that public companies are constantly monitoring staff performance and often have problems with financial resources (Williams, 2003), which can negatively affect employee satisfaction. Consequently, the following hypothesis can be posed:

H₃: The level of development of the employer brand is higher in private than in state-owned enterprises.

RESEARCH METHODOLOGY

In order to test research hypothesis, a survey was conducted on the sample made by companies operating in the territory of the Republic of Serbia. The questionnaire was distributed in two ways: in written and electronic form, and in this way a sample of 124 respondents was formed.

Analysis of the structural characteristics of the companies in the sample shows that the largest number of those companies have up to 49 workers (52,42%). In the second place are companies that employ 50 to 249 workers (25%), while in third place there are companies with more than 250 employees (25%). When it comes to business, the largest number of companies belongs to the service sector (52,42%), while on second and third place are production and trading companies (25,81% and 21,77%, respectively). Of the total number of companies surveyed 63,7% were financed with private, while 36,3% of companies were financed with state capital.

A questionnaire was used to collect data that was segmented into two parts. The first part of the questionnaire was designed to determine the degree of development of the employer brand. Items for measuring employer brand were taken from the relevant researches in this field: Hanin et al. (2013), Berthon et al. (2005), Highhouse et al. (2003) and Srivastava and Bhatnagar (2010). This items were taken because they represent high degree of reliability. Respondents showed the level of agreement or disagreement degree on the five-point Likert scale, whereby grade 1 was an absolute disagreement, while grade 5 related to the absolute agreement with the statement. Finally, the second part of the questionnaire is designed to determine the structural characteristics of the companies in the sample. The statistical software "SPSS v.23" was used for data processing. Descriptive statistical analysis, reliability analysis, t test and variance analysis (ANOVA) were applied in stastical research.

RESULTS AND DISCUSSION

At the beginning of the statistical analysis, arithmetic meanings and standard deviations for all 10 statements were calculated, and also the level of internal consistency of the observed variable (Cronbach alpha). When it comes to the reliability of the used statements, the obtained Cronbach alpha coefficient value is 0,895 and, as such exceeds the minimum defined value of 0,7 (Nunnally, 1978). It can be noted that good internal consistency of the observations used to measure the model variability has been achieved. The results of descriptive statistics are presented in Table 1.

The average score of the employer brand on the five-point Likert scale is 3,47, which suggests that companies in the sample are distinguished as a desirable places to work. The highest level of convenience of the respondents' attitudes was achieved at the statement "*The company has a*

good potential for development in the future period”, (arithmetic mean = 3,98). Relatively high values were also achieved in other statements, except for those related to earnings (arithmetic mean = 2,67). The highest level of homogeneity of the respondents' attitudes was achieved at statement “*Other people see the company where I work as a good place to work*”, (standard deviation = 1,09). However, the biggest disagreement occurs at the statement “*There is a good balance between time spent at work and free time*”, (standard deviation = 1,44). In order to examine H₁ and H₂ hypothesis, ANOVA test is applied. When it comes to the size of the company, the ANOVA test results are shown in Table 2.

Table 1. Results of descriptive statistical analysis

Number	Item	Arithmetic mean	Standard deviation
EB1	The firm in which I work stands out as an employer in relation to other firms.	3,46	1,42
EB2	This company is attractive to me as a place for employment.	3,35	1,38
EB3	Other people see the company where I work as a good place to work.	3,97	1,09
EB4	Working in the company is paid above the average.	2,67	1,34
EB5	Jobs are done in a good working conditions.	3,42	1,31
EB6	There is a good balance between time spent at work and free time.	3,23	1,44
EB7	Company provides good promotion opportunities to the employees.	3,1	1,4
EB8	Relationships between employees are good.	3,67	1,22
EB9	The company offers quality products and services.	3,86	1,16
EB10	The company has a good potential for development in the future period.	3,98	1,14

Source: Authors

Table 2: Level of development of the employer brand between companies of different sizes

Item	Up 49 vs. 50-249		Up49 vs Over 250		50-249 vs. Over 250	
	Mean difference	p	Mean difference	p	Mean difference	p
EB1	0,201	0,811	-0,079	0,971	-0,281	0,753
EB2	0,423	0,37	0,548	0,212	0,125	0,94
EB3	-0,192	0,722	0,219	0,673	0,411	0,353
EB4	0,268	0,66	0,213	0,783	-0,055	0,988
EB5	0,335	0,475	0,973	0,004***	0,637	0,156
EB6	0,48	0,988	0,445	0,396	0,397	0,573
EB7	0,307	0,598	0,557	0,21	0,25	0,788
EB8	0,917	0,002***	0,653	0,049**	-0,263	0,685
EB9	0,256	0,599	0,459	0,219	0,202	0,798
EB10	0,382	0,309	0,056	0,976	-0,326	0,549

Note: p<0,01***, p<0,05**, p<0,1*

Source: Authors

In order to determine differences between companies with different sizes, the ANOVA Scheffe alpha post test was applied. The results of the test showed a statistically significant difference in a small number of statements. The above difference was established between companies that

employ up to 49 and between 50 and 249 workers only in relation to the existence of good relations between employees. A statistically significant difference between companies employing up to 49 and over 250 workers occurs in the following statements: “*Jobs are done in a good working conditions*” and “*Relationships among employees are good*”, wherein the additional analysis showed that superiority occurs in companies that employ up to 49 workers. However, because large number of employer brand statements did not show statistically significant difference, it can be concluded that there is no statistically significant difference in the degree of development of the employer brand between enterprises of different sizes. Because of that H1 hypothesis was not supported.

In order to determine differences between companies with different type of activities, the ANOVA Scheffe alpha post test was applied. Results of the test are shown in Table 3.

Table 3. Level of development of an employer brand between enterprises of different activities

Item	Production vs. Trade		Production vs. Services		Trade vs. Services	
	Mean difference	p	Mean difference	p	Mean difference	p
EB1	0,612	0,246	0,289	0,643	-0,322	0,6
EB2	-0,040	0,993	-0,556	0,176	-0,515	0,246
EB3	0,144	0,876	-0,125	0,868	-0,27	0,546
EB4	-0,015	0,999	0,288	0,614	0,303	0,604
EB5	-0,520	0,298	-0,524	0,181	-0,003	1
EB6	-0,410	0,543	-0,316	0,601	0,093	0,959
EB7	-0,262	0,765	-0,331	0,554	-0,068	0,977
EB8	-0,734	0,061*	-0,118	0,902	0,616	0,076*
EB9	0,525	0,208	0,519	0,119	-0,006	1
EB10	0,136	0,891	0,645	0,031**	0,508	0,129

Note: p<0,01***, p<0.05**, p<0.1*

Source: Authors

As in the previous case, the test showed a statistically significant difference in a small number of statements. This difference was found between production and trading companies only in the context of the existence of good interpersonal relations between employees, with trade companies being preferred. A statistically significant difference between production and service companies occurs only in the case of the potential of the company in the future period, where the additional analysis of the elements showed the advantages of manufacturing enterprises. When comparing trade and service companies, the analysis found that a statistically significant difference occurs only in the context of good interpersonal relationships, with the advantage of trading companies. However, because large number of employer brand statements did not show statistically significant difference, it can be concluded that there is no statistically significant difference in the degree of development of the employer brand between enterprises of different activities. Because of that H2 hypothesis was not supported.

In order to examine H₃ hypothesis the t test was applied, which results are presented in Table 4.

The results of the t test showed that at half of the findings there is a statistically significant difference in the degree of development of the employer brand between private and state-owned enterprises. This difference is present in the following statements: “*This company is attractive to me as a place for employment*”, “*Jobs are done in a good working conditions*”, “*Company provides good promotion opportunities to the employees*”, “*Relationships between employees are good*” and “*The company offers quality products and services*”. An additional analysis of the

elements has determined that priority is given to private companies operating in the territory of the Republic of Serbia, according to which it can be concluded that the level of development of the employer brand is higher in private than in state-owned enterprises, thus the H3 hypothesis is partially confirmed.

Table 4. The results of the t test

Private vs. State-owned companies		
Item	Mean difference	p
EB1	0,128	0,63
EB2	0,626	0,014**
EB3	-0.155	0,447
EB4	0,353	0,16
EB5	0,553	0,023**
EB6	0,284	0,292
EB7	0,478	0,066*
EB8	1,08	0,000***
EB9	0,552	0,011**
EB10	0,323	0,129

Note: p<0,01***, p<0.05**, p<0.1*

Source: Authors

CONCLUSION AND FURTHER RESEARCH

One of the ways of attracting and retaining quality candidates from the labor market is the employer brand. Understood as the overall effort of the company to communicate the image of a unique and desirable place to work, the employer brand implies a combination of various tangible and intangible benefits, such as competitive wages, a balance between life and work, the acquisition of additional knowledge, good working atmosphere and a number of other factors that can act positively to employee satisfaction, and consequently to organizational commitment and performance. However, there are many factors that can affect the degree of development of the employer brand. Starting from the objective goal and defined hypotheses in work, a conclusion can be drawn on the degree of development of the employer brand in companies of different sizes, activities and ownership structures operating in the territory of the Republic of Serbia.

Based on the survey of 124 respondents employed in Serbian enterprises, it was found that with the highest number of findings there was no statistically significant difference in the degree of development of the employer brand between enterprises of different sizes. A statistically significant difference occurs at the statements related to the good working conditions and good interpersonal relations. However, contrary to the results of other surveys, the employer brand is more developed at smaller companies. This can be explained by the national culture of the Republic of Serbia in which collective values dominate. Small businesses have a greater chance of getting to know employees and getting into good interpersonal relationships. As a result of collective values, employees will transfer their positive experience to the public and thus shape the image of the company as a preferred place to work. The result obtained is consistent with the concluding observations that Alniaçik et al which pointed out the importance of cultural values (Alniaçik et al. 2014). When it comes to the activity of the company, as in the previous case, there is no statistically significant difference in the majority of the findings, except for the conclusions concerning good interpersonal relations and the potential for the development of the

company in the future period, where this difference was found. Since most statements have not been confirmed, H1 and H2 hypotheses were not confirmed. The results obtained are specific for several reasons. First of all, the companies surveyed in the sample are distinguished as unique places for work. In such enterprises employees are seen as a valuable resource that must be employed to maintain a sustainable competitive advantage. However, as all companies operate in unique economic and cultural conditions, the implementation of an identical human resource management practice occurs, which may be the reason for the absence of a statistically significant difference. In addition, the companies surveyed mostly belong to similar branch activities, which may also be the reason for the absence of a difference. When it comes to the ownership structure, the results of the research showed that the level of development of the employer brand is higher in private than in state-owned enterprises operating in the territory of the Republic of Serbia, thus confirming the H3 hypothesis. Private enterprises have a more developed employer brand, which can be explained by the fact that work in the public sector is often characterized by stressful and routine jobs, lower wages, poor employee participation in decision making, constant employee control etc. In addition, companies in the public sector generally perform jobs that have a wider social significance, often involving activities that do not positively affect employee satisfaction. On the other hand, work in private companies often involves a creative task, modern working methods, stimulative compensations and various other factors that can positively affect employees.

Empirical research in the area of the employer brand is not widely represented on the territory of the Republic of Serbia, thus creating the basis for further scientific research. The practical contribution of the work is to provide the results to managers and experts in the field of human resources management who can use them to create such a business practice that will singulate their enterprise as a unique and desirable place to work. As a limitation of work it is necessary to point out the size and structure of the sample. In future works, in addition to increasing the size of the sample, research should be carried out in order to achieve equal participation of enterprises of different activities and sizes in the sample. It is desirable that future research should be conducted in the way to determine the main reasons why certain companies are distinguished as desirable places to work, and whether multinational companies operating in the territory of the Republic of Serbia have developed an employer brand.

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A SOCIAL-RESPONSIBILITY VIEW AT LEGAL AND ETHICAL ASPECTS OF EMPLOYMENT OF OLDER WORKERS IN THE REPUBLIC OF SLOVENIA

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Abstract: *Until a few decades ago, elderly provided a much smaller percentage of population than today and in the years to come. Then, the global socio-economic development installed the neoliberal capitalism with its monopolistic attributes replacing the free market on the global level. These attributes include two contradictory processes, at least, (1) a falling percentage of employed population (and a growing percentage of non-permanent jobs) resulting, among other consequences, in declining funds supporting the retired elderly, and (2) a growing number of retired elderly with small pensions. These facts open the issue of employment of older workers, we are concentrating on here. The selected viewpoint is the level of social responsibility of the society about the elderly employees, as provided by law, which is usually backed by economics of the time.*

For a decade a very international team was working on ISO 26000, which was then passed in 2010, i.e. two years after the official outbreak of the current socio-economic global crisis. ISO 26000 was officially seen as the way out from the crisis.

ISO 26000 (ISO, 2010) requires a holistic approach (based on interdependence) and includes seven content areas: (1) organization, management and governance, (2) human rights, (3) labor practices, (4) environment, (5) fair operating practices, (6) consumer issues, and (7) community involvement and development.

Seven principles support interdependence and holism: 1. accountability, 2. transparency, 3. ethical behavior, 4. respect for stakeholder interests, 5. respect for the rule of law, 6. respect for international norms of behavior, and 7. respect for human rights.

Obviously, an innovation of values by knowledge-cum-values management is demanded (Zlatanović, Mulej, 2016). It should be supported methodologically. We will not publish them here. We will only state another point: social responsibility reaches beyond law, but never replaces law. Therefore, we will discuss Slovene law about elderly and their employment from the viewpoint of social responsibility about elderly's employment.

In terms of working activity of elderly in the age group 55 – 64, Slovenia is the second last country in Europe. Employees over 55 enjoy a special attention and care. The basic legal act about this topic is the Employment Act, having its basis in the Constitution of the Republic of Slovenia. Legislation abounds, but without synergy.

Keywords: *social responsibility, legal aspects, ethical aspects, employment, older workers*

JEL Classification: M14, M50, K20

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INTRODUCTION

Until a few decades ago, elderly provided a much smaller percentage of population than today and in the coming years (soon; later it will not grow again due to less many births) (Zupančič, 2016). In the same period of time, the global socio-economic development changed the current society from the liberal to the neoliberal capitalism with its monopolistic attributes replacing the free market on the global level. For the seven small countries that emerged from Yugoslavia since 1991 this process generates the danger of becoming neo-neo-colonies in economic terms (For details see: Mulej et al, ed., 2013; 2014; 2015; 2016; 2017). These attributes include two contradictory processes, at least, (1) a falling percentage of employed population (and a growing percentage of non-permanent jobs that we will not tackle here) resulting, among other consequences, in declining funds supporting the retired elderly, and (2) a growing number of retired elderly with small pensions. These facts open the issue of employment of older workers, we are concentrating on here (we are leaving aside the expected need for elderly employees in later times). The selected viewpoint is the society's level of social responsibility about the elderly employees, as provided by law, which usually reflects economics of the time. The research gap tackles the legal order of the employment of older workers in the Republic of Slovenia. A social-responsibility view at legal and ethical aspects of it is the research subject in terms of ISO 26000 that was passed by the global humankind's body 'International Standards Organization' in 2010 as an advising (rather than obligatory) standard aimed at helping humankind find its way out from the global socio-economic crisis, which showed up only two years earlier. Consideration of ISO 26000 exposes three main requirements:

- (1) everybody's individual and organizational responsibility for influences over society (rather than irresponsibility of the untouchable bosses and uninfluential subordinates);
- (2) interdependence (rather than independence of the untouchable bosses and dependence of the uninfluential subordinates);
- (3) holism (rather than one-sidedness of the narrowly specialized untouchable bosses and uninfluential subordinates).

These requirements address also the issue of the legal order about the elderly employment. Laws are many, but their synergy is necessary and often unattained.

After an overview of the theoretical background of the presented research, and a short look at the methodology, the issue of the elderly persons' employment in Slovenia is investigated, focusing briefly on all critical legislation; then Conclusions and recommendations follow.

THEORETICAL BACKGROUND

In Adam Smith's times there were many less employed persons and retirement schemes (outside agriculture) except the three-generation family's solidarity. As we know from Charles Dickens's books on his own experience as a child 'Oliver Twist' and 'David Copperfield', which is his autobiography, Dickens's passionate advocacy on behalf of children and the poor and highlighting the life of the forgotten poor and disadvantaged within society, reflect a period of industrialization with a poor care for humans, including children and elderly (Wikipedia on Charles Dickens, visited on 29 May 2018).

It is well known that Adam Smith wrote his book "Theory of Moral Sentiments" (1759) before his "An Inquiry into the Nature and Causes of the Wealth of Nations" (1776). As a professor of ethics and moral he presupposed ethics of altruism would help people overcome their natural selfishness, which was and is making them forget about solidarity and interdependence, once they feel that a narrow individualism might help them better than solidarity.

Today, altruism is no more appealing than it used to be to most people in Smith's times or in industrial and postindustrial capitalist times, especially in the current neoliberalism. But the

missing altruism can well be replaced, even in the hard, very competitive business world, by ethics/VCE of interdependence which surfaces as creditworthiness, trustworthiness, credibility, reliability, and so on – for clear economic reasons. The Smith's 'invisible hand' does not express one-sidedness of the business partners: reliable partners do not lose their partners, who return again and again to do business and generate profit with relatively low cost and effort that is smaller than the effort to find new high-quality employees, suppliers, buyers and other partner, than the strikes, the illness, the poor productivity, or absenteeism, presentism, consequences of monopolies, both on the part of governments and enterprises, repairing the destroyed nature, etc. are.

The Emperor Wilhelm (1859, Berlin, Prussia /not Germany, yet/, 1941) and his government chair Otto von Bismarck introduced in 1881 old-age security. It was financed by contributions and covered a lot of rights, but at a relatively old age of employees. It was based on Siemens factory model. Due to the limitation to the very old age of entitled persons the model covered the ISO 26000 concepts very partially, rather than supporting systemic, i.e. requisitely holistic behavior.

In the area of now-a-days Slovenia (as a part of Austria-Hungary then) social security was introduced only 8 years later; earlier, miners had it since 1854, railway workers since 1874, public servants since 1906, it became more general since 1937 in Kingdom, and general, except for farmers and handicrafts since 1946 in socialist Yugoslavia; now it is fully general (Zupančič Slavec, 2010). Though, this fails to solve all troubles.

E.g., elderly abuse is a perpetual challenge in every society. The elderly ones are impacted by and suffer through different types of elder abuse: physical abuse, sexual abuse, emotional and psychological abuse, financial abuse and exploitation, abandonment, neglect and self-neglect. In order to improve the independence of the elderly, the society has to be socially responsible and has to protect the health, safety, welfare and the rights of elderly (Ambrožič, Žlof, Mulej, 2016).

European funds aimed at increased older employees' competencies and longer work activity encourage EU member states to undertake socially responsible actions. The European Social Fund (ESF) co-finances programs up to 80% offering several activities contributing to stronger competencies of the older employees, to awareness of the negative demographic trends and the necessary adaptations to them, and to support the employers' efficient aging workforce management (Ambrožič, Mulej, 2018).

During the crisis, when Slovenia is trying to reestablish a friendlier and above all an accessible working environment and follow EU practices, the need for socio-economic innovations is emerging. Among them we can include a relatively new interdisciplinary scientific knowledge - social gerontology, which emerged from the practice that demanded care for elderly. The point of view of social gerontology from an economic point of view is to activate older people for economic and other socially useful purposes and well-being (Ambrožič, Mulej, 2017).

Socially responsible recruitment involves a process of dialogue between the company and employees on careers, wishes, trust, skills and development needs and the development of a system of human resources development, taking into account the guidelines of the concept of social responsibility, which in many respects can include the principles of labor law (Ambrožič, 2010) and systems theory as a methodology of holistic approach to anything.

Reflection of the above findings in systemic behavior and/via social responsibility detects that systems theory has many versions (François, 2004). Many of them consider selected parts of reality from their selected viewpoints. Thus, many of them, although useful and beneficial, deviate from the basic difference of systems theory and cybernetics from the traditional sciences and practices: to fill in the gap in human knowledge and values resulting from oversights caused by over-specialization and lack of inter-disciplinary creative cooperation (See: Bertalanffy,

1951/1968, edition 1979; Wiener, 1948). Thus, creative cooperation leads toward the requisite holism as the solution for humankind to never repeat the world wars and big recession of 1914-1945. Now, a similar dangerous crisis is here, as the daily press reports. Solution requires requisitely holistic management of human knowledge and values.

In order to overcome the current global socio-economic crisis, humankind must overcome two types of crisis: (1) oversights due to the narrowly specialized and poorly cooperating persons' non-systemic behavior and its management; (2) over-specialization inside systems theory and cybernetics causing fictitiously systemic behavior and its management.

For four decades we have been offering a solution by Mulej's Dialectical Systems Theory (Mulej, 1974; Mulej et al, 2013; many publications between them) with many thousands of successful cases of application. Though, our cases were more often local than global.

Now, a new solution is offered on the world-wide level: (corporate) social responsibility that supports systemic behavior (not thinking only), informally (ISO 26000 standard, by ISO, 2010); it covers all topics of human activity and exposes seven principles of systemic behavior. It is interesting that the United Nations Organization's document on social responsibility was passed in 2000, when the crisis was around the corner and president of USA was trying to solve it by Hitler-like tools, i.e. production of weapons under the name of war on terrorism (now, Trump is doing the same). For a decade a very international team was working on ISO 26000, which was then passed in 2010, i.e. two years after the official outbreak of the current socio-economic global crisis. ISO 26000 was officially seen as the way out from the crisis. Why so?

ISO 26000 (ISO, 2010) requires a *holistic approach* (based on *interdependence*) and includes seven content areas: (1) organization, management and governance, (2) human rights, (3) labor practices, (4) environment, (5) fair operating practices, (6) consumer issues, and (7) community involvement and development.

This requirement is supported by the following 7 principles: 1. accountability, 2. transparency, 3. ethical behavior, 4. respect for stakeholder interests, 5. respect for the rule of law, 6. respect for international norms of behavior, and 7. respect for human rights (ISO 2010: 10-14).

European Union (2011) defines social responsibility as one's responsibility for one's impact over society. EU suggests its member states and big enterprises to be role models of social responsibility as a way out from the current socio-economic crisis.

All these contents are linked by two crucial terms from the (Dialectical) Systems Theory: (1) interdependence, and (2) holism. They crucially change the prevailing current VCEN practices – toward responsibility.

ISO (2010) suggests in ISO 26000 (pp: 69-84) the following procedure to make social responsibility a normal practice: Step 1: The relationship of an organization's characteristics to social responsibility; Step 2: Understanding the social responsibility of an organization; Step 3. Practices for integrating social responsibility throughout an organization; Step 4: Communication on social responsibility; Step 5: Enhancing credibility regarding social responsibility; Step 6: Reviewing and improving an organization's actions and practices related to social responsibility; and Step 7: Voluntary initiatives for social responsibility.

Obviously, an innovation of values by knowledge-cum-values management is demanded (Zlatanović, Mulej, 2016). It should be supported methodologically. We will not publish them here. We will only state another point: social responsibility reaches beyond law, but never replaces law (e.g. Zore, 2016, and references mentioned so far). Therefore, we will now continue with issues of law about elderly and their employment rather than their unwished retirement – from the viewpoint of social responsibility about elderly's employment.

METHODOLOGY

Authors used desk research of the selected references.

ELDERLY PERSONS' EMPLOYMENT IN SLOVENIA

In terms of working activity of elderly in the age group 55 – 64, Slovenia is the second last country in Europe. Employees over 55 enjoy a special attention and care. The basic legal act about this topic is the Employment Act. One must see the difference between the (1) employed elderly under the usual labor relations, and the (2) retired persons. The latter ones may work on a part-time or time-to-time basis with a special civil-law contract relation between the employer and entitled person. In this relation the employer must apply all provisions of the labor legislation, including the ones on prohibition of discrimination and torturing on job, equal treatment in terms of gender, working time, breaks, resting and liability for damages recovering; the employer must also respect the rules on security and health on job. The principle of (non-) discrimination is in forefront of all rules, having its basis in the Constitution of the Republic of Slovenia. (Zupančič, 2016)

The concrete given legal situation has many components, as follows.

International regulations on the protection of older workers

Charter of Fundamental Rights of the European Union 2010 / C 83/02 (Article 21, prohibition of discrimination and Article 25; The Union recognizes and respects the right of older people to a decent and targeted education and participation in cultural and social life).

Directive 2000/78 / EC on the general framework for equal treatment in employment and occupation (Article 1 specifically prohibits discrimination against older people in the labor market).

Convention and Recommendation MOD No. 111 of 1958 on discrimination and employment in occupations, which specifically govern the rights of older workers (Article 1, as circumstances considered as discrimination, is any differentiation, exclusion or preference aimed to eliminate or compromise equal opportunities or a procedure for employment or occupations).

Recommendation MOD No. 126 of 1980 on older workers (countries should solve the problem of employing older workers with a strategy for achieving full employment and with appropriate social policy; the LUA is not a legally binding regulation).

Legal basis for the elderly persons' employment in Slovenia

According to Eurostat, the population in Europe is aging and is expected to reach almost 27% of the population over 65 years of age by 2040. The workforce is also aging and the share of older workers (55-64 years) is increasing. By 2029, the proportion of elderly population - 65 years or more in Slovenia should reach 24.8% (in 2029, according to projections, there might be 66,478 Slovenian men and women aged 85 or more (SORS, 2010).

The changed age structure of the population and, consequently, the reduction in the labor supply, along the current regulation of the labor market and the pension system, require the necessary adjustments in the labor market and in the field of education, which will ensure longer stay in the activities and efficient exploitation of the potential of all generations. Adjustment of workplace and working time to older workers and the intergenerational transfer of knowledge and promotion of creativity in the workplace, which in practice means the prevention of the European Union's Charter of Fundamental Rights 2010 / C 83/02 (Article 21, prohibition of discrimination, and Article 25; The EU recognizes and respects the right of the elderly to have a decent and targeted education and participation in cultural and social life).

Directive 2000/78 / EC on the general framework for equal treatment in employment and occupation (Article 1 specifically prohibits discrimination against older people in the labor market) or discrimination in the workplace, the adaptation of staffing plans, and so on.

The European Parliament was the initiator of the three-year pilot project "Safer and healthier work at all ages", focusing on the challenges to health and safety at work resulting from an aging workforce in Europe. From the findings in the project, it is clear that safety and health systems for sustainable work must fulfill several basic conditions. These include:

- Improved prevention for all in order to prevent workers from leaving the labor market for medical reasons, and to enable them to maintain and increase their working capacity;
- Specific measures for a diverse workforce based on risk assessments that take account of diversity;
- A comprehensive approach to prevention and promotion of well-being at work by integrating safety and health at work with other areas;
- Providing support to businesses, in particular micro and small enterprises;
- Social dialogue at all levels;
- An integrated policy that goes beyond the boundaries between different policy areas, safety and health at work, employment, public health, education and economic and social affairs.

On July 20, 2017, the Government of the Republic of Slovenia adopted the Long-living Society Strategy at its 144th regular meeting. It defines the vision and the main goals in shaping the answers to the challenges due to the changed age structure of the population in Slovenia, and outlines the strategic orientations and goals of its operations in four areas:

- independent, healthy and safe life of all generations;
- integration into society;
- creating an environment for activity throughout the life cycle;
- employment, work activity.

Constitution of the Republic of Slovenia (Constitution of RS)

Each country has a Constitution or a set of fundamental principles and rules governing state and social order, irrespective of whether these principles and rules are written in a constitution (in the act) or comprise various other written and unwritten sources. The latter is represented in the English constitution, which is not written (Osolnik, 2001, Basle 2011). The Constitution of the Republic of Slovenia was adopted, proclaimed and entered into force on 23 December 1991.

Following the hierarchical order, the Slovenian Constitution is the highest legal act adopted and supplemented by the National Assembly by a special procedure with a two-thirds majority. Other legal acts in this order are: the laws adopted by the National Assembly, the decrees of the government for the implementation of laws, regulations, guidelines and the ordinances of ministries for the implementation of laws and government decrees, as well as the regulations of local self-governing bodies adopted by them for the regulation of matters within the framework of their competences.

According to its highest legal power, the constitution is the "suprema lex" or "the highest legal act". In its content and in relation to laws, the constitution is a basic or starting legal act. The constitutional act is the political act by the will of the constitutor, and in the form and content, and the legal nature, the constitution is a general legal act, since it refers to all legal entities in the territory and in general terms governing basic social relations (Kovač, 2010). The inviolable

part of the constitution represents its fundamental values and principles, such as the legal and social state, the principle of democracy, the guarantee of fundamental rights and freedoms, etc.

The Constitution of the Republic of Slovenia stipulates in Article 14 that in Slovenia everyone has the same human rights and fundamental freedoms, regardless of nationality, race, sex, language, religion, political or other belief, material status, birth, education, social status, disability or any other personal circumstance. Article 49 ensures freedom of work, according to which everyone can freely choose employment. Every workplace is accessible to everyone under the same conditions. Forcible work is forbidden.

The Employment Relationships Act (ZDR-1)

This Act regulates the employment relationships concluded with a contract of employment between the worker and the employer. Among the articles relating to the age of a worker, it is necessary to distinguish between the concepts of an older worker and a worker prior to retirement. Among the articles referring to an older worker, it should be pointed out:

- Article 6 of ZDR-1, according to which the employer must provide equal treatment to the male and female jobseeker in employment;
- Article 197 of ZDR-1, according to which the status of an older worker belongs to the one who is 55 years of age or older, regardless of the completed work or pension period. Such a census applies to both men and women, and the age condition is not exacerbated in the coming years;
- Article 198 of the ZDR-1, after which an older worker may conclude a contract of employment or, he or she has the right to start working part-time, shorter than full time, at the same or other relevant workplace, if he or she is partially retired;
- Article 199 of ZDR-1, according to which an employer may not order to an older worker an overtime work or night work without an employee's written consent;
- Article 159 of ZDR-1, according to which an older worker, a disabled person, a worker with at least 60% physical impairment and a worker who nurses and protects a child who needs special care and protection in accordance with the regulations governing family, benefits at least three additional days of annual leave.

Article 113 of ZDR-1 is to be considered among articles referring to a worker before retirement. Under this Act, a worker before retirement is a person who has reached the age of 58; this is a worker who, up to the age related retirement conditions, falls short of five years of retirement age. Such a person may not be terminated an employment contract for business reasons without the written consent of the person until the worker has fulfilled the conditions for obtaining the right to a retirement pension. ZDR - 1, however, allows for a few exceptions when a cancellation can be made for business reasons, namely:

- If the employee is offered another suitable employment, in accordance with the ZDR-1 provisions for the offer of a new contract;
- If at the time of signing the employment contract the worker already fulfilled the legal conditions for protection against cancellation;
- If the worker receives unemployment benefits until he has fulfilled the conditions required for retirement with full retirement age;
- if the procedure for the termination of the employer is introduced.

Article 226 of ZDR-1 should also be mentioned among the articles related to the workers before retirement. Notwithstanding the provision of the first paragraph of Article 114 of the ZDR - 1, they enjoy special protection against dismissal of workers who in 2013 fulfill the condition of

54 years and 4 months - women and 55 years - men, and workers who in 2014 fulfill the condition of age 55 years. In the next three years, until reaching the age of 58, the retirement age for workers is increased annually for one year.

The Anti-Discrimination Act (ZVarD)

Article 1 of this Act defines the protection of every individual against discrimination irrespective of sex, nationality, race or ethnic origin, language, religion or belief, disability, age, sexual orientation, sexual identity and sexual expression, social status, wealth, education or any other personal circumstance in various fields of social life, in the exercise of human rights and fundamental freedoms, in the exercise of rights and obligations, and in other legal relations in the political, economic, social, cultural, civil or other fields. This law defines and prohibits discrimination, provides for bodies and measures for the promotion of equal treatment, determines the position and powers of the advocate of the principle of equality, the procedure faced by the advocate in case of establishing the existence of discrimination and the special features of the legal protection of discriminated persons.

Health and Safety at Work Act (ZVZD-1)

Article 5 of ZVZD-1 stipulates that the employer must pay particular attention to ensuring the safety and health of older workers and the Article 37 stipulates, that the employer must ensure that older workers are informed about the results of risk assessment and about the employer's actions for the safety and health of workers at work.

Law on Intervention Measures in the Labor Market (ZIUPTD)

With this Act, a temporary incentive for the employment of older unemployed persons is provided for the promotion of employment. Article 3 of this Act provides for an exemption from the payment of contributions for the elderly under the conditions that older than 55 years and being at least 6 months registered in the register of the unemployed at the ZZRS, and that the employment contract is concluded for the period from January 1, 2016 to December 31, 2019. The exemption from payment relates to employer's social security contributions (contributions for pension and disability insurance, health insurance, parental protection and unemployment insurance).

The exemption from the payment of employer's contributions shall be enforced by the Financial Administration of the Republic of Slovenia. Exemption from payment of contributions may be undertaken by employers who:

- Have not initiated the termination of the employment contract in the last 3 months prior to the conclusion of the employment contract with the elderly unemployed or have not terminated the employment contract on the grounds of business;
- Did not have a blocked bank account over 30 consecutive days or more before the conclusion of the employment contract with the elderly unemployed;
- Have regularly paid salaries and paid compulsory contributions to the social security of employees in the last 6 months prior to the conclusion of the employment contract with older unemployed persons.

CONCLUSIONS AND RECOMMENDATIONS

The official legal regulation of labor relations is supposed to be quite close to a systemic behavior. But no law can regulate every event or situation. Therefore, the decision makers, which is everybody, need also the VCEN/ethics of social responsibility in order not to misbehave and mistreat each other. Evaluation of the promotion of the extension of work activity in Slovenia on the basis of the three basic items of social responsibility according to ISO 26000, which are:

responsibility for the effects on society, interdependence, and holistic approach finds it is still far from "excellent". Measures such as permanent employment of elderly unemployed for an indefinite period or the fulfillment of conditions for early or old-age retirement are very welcome, but due to limited financial resources, they are only a "drop in the sea". There is a need for more serious awareness of the demographic-age picture and appropriate action, and for synergy of the given laws.

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- Zakon o interventnem ukrepu na področju trga dela (Uradni list RS, št. 90/15 in 75/17)

CONFLICTS ARISE-ALTERNATIVE DISPUTE RESOLUTION LEVELS AND METHODS

Csilla Kohlhoffer-Mizser¹

„With whom happens a deliberate case, that person will not experience injustice.” (Ulpianus)

Abstract: *Mediation is an opportunity in the subject of alternative dispute resolution system (ADR-system), as one kind of procedures to solve a conflict. Mediation is based on the voluntary participation of the parties. Mediation is a procedure, in which an intermediary without adjudicatory powers -the mediator- systematically facilitates communication between the parties with the aim of enabling the parties themselves to take responsibility for resolving their dispute. Business and companies also know the definition of conflict. According to this fact, they have to be able to manage and solve conflicts. There are several procedures worldwide, business can choose: the communication can be systematically facilitated with the aim of enabling the parties themselves to take responsibility for resolving their dispute. Companies, enterprises, organizations, corporations has to manage their conflicts. Alternative dispute resolution (ADR) methods are to support natural persons and legal entities with several levels of conflict management. Reorganisation, resolution, restoration, evaluation and transformation are present to give methods to the parties, even if there is cross border aspect in the case.*

Even in higher education, during the university teaching process we solve a conflict together with the students, from the beginning until the end of the case, so we finish with a binding agreement -the method shows step by step how to reach a reorganization, a resolution in legal or simply in human relationships. With special attention to business mediation we have to try to use consensus based procedure instead of compromise based solution. With this background, the knowledge about process and methods of ADR can help students to be able to solve conflicts with their own competences.

Types of alternative dispute resolution can be used worldwide in civil law (not only in family law/divorce cases), in criminal law, in business cases, in connection with consumer rights, in public administration, in financial cases (conciliation), in labour law (cases in working places), in case of conflicts inside the organisations and between organizations and in school conflicts (problems waiting for solution and violence at school).

The question is: to solve the conflict and find a solution or to transform a conflict and reshape the connection between the parties, or both? This publication tries to show a possible answer.

Keywords: *Alternative Dispute Resolution, methods, conflict, conflict-management, trust*

JEL Classification: *K00, K19, K36, K40, K42*

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INTRODUCTION

The following study is focused on alternative dispute resolution as an alternative of judicial procedures, first with an overview of Hungarian status of court judicial proceedings, supported by figures from 1990 to 2016 and of the successful closed –with binding agreement–mediation. The subject of the research are the tools and methods of alternative dispute resolution, which facilitate a special field of communication, a kind of communication, which is able to lead the persons from conflict to connection.

After the introduction (1) the paper studies first the settlement of conflicts (2) and gives an overview about several types of cases, court trials, number of cases and about completed (successfully and unsuccessfully) mediation procedures. In the following part of the study the alternative dispute resolution's tools and methods are introduced and examined (3), which part is followed by conclusions and recommendations (4).

Every person, legal entity (state), community has its own and special social-historical-financial development level. Communication has an important role to reach a contract (one way of resolution) and trust plays an important role in this procedure of communication (non-violent communication). Trust (Lazányi, K. 2017), (McKnight DH, 1996), (Rousseau, DM. et al., 1998) can support conflict management and is able to give a snapshot of the general state of society, and is capable of influencing person's (people, legal entities, communities, states) compliance with the law. Trust is a precondition for companies, enterprises, organizations, corporations to manage their conflicts. Trust based alternative dispute resolution (ADR) methods are to support natural persons and legal entities with several levels of conflict management. The parties must trust the mediator in order to reveal the needs and interests underlying their stated position. (Waldman, 1998) Reorganisation, resolution, restoration, evaluation and transformation are present to give methods to the parties, even if there is cross border aspect in the case. Trust is an unavoidable part of the mission of ADR, because the beginning of the procedure is worldwide a voluntary need and consent of the parties.

The aim of this paper to present and highlight from a country perspective that we can not infer from the litigation data that alternative dispute resolution has come to fruition, but the number of successfully settled mediation cases is still rising. The question is: to solve the conflict and find a solution or to transform a conflict and reshape the connection between the parties, or both? This publication tries to show a possible answer.

SETTLEMENT OF OUR CONFLICTS –WITH OR WITHOUT TRIALS?

Conflict is everywhere. Some kind of conflicts is between nations, others are between individuals. The question is not whether we have conflict or not, but how we deal with it –we can fight back –we can ignore, hope it goes away –we can go to the court to decide who is right or wrong –or we can go to mediate. There are many areas of mediation. In the list of many areas, completeness can not be achieved, as atypical cases are known, too.

- family law
- inheritance law, inheritance disputes
- conflicts in neighbouring countries
- labor, labor law
- education
- health
- criminal law
- health
- consumer protection
- financial institutions
- legal persons, business associations

The methodology and the structure of the procedure may be different, it is not necessary and appropriate to work with the same tools for a neighbouring or family law case. Even within the same branch of law or legal area, it is true that there are not two identical cases, so there is no pattern to be attached to each and every one has to be examined from time to time, which methods will be the most expedient in the particular case.

Mediation by using process techniques, using different methods and directions, which keeps the procedural communication in mind, provides the appropriate framework for reaching the goal of the parties. In this framework, it is necessary to use the tool of evaluative, restorative and transformative, that is, converter mediation. Facilitative mediation is known since the 1960's and 1970's, as only type of mediation (Zumeta, 2000), however however, in the literal sense I am of the opinion that any alternative dispute resolution facilitates.

This does not mean that, in view of the data of recent years, the hunger for litigation for example in Hungary will cease to exist. However, in the development of litigious procedures, there is a significant reduction in civil, but expressed, business lawsuits, and this is true of business non-litigious procedures. One example: in 2009, 620,597 civil and non-economic claims were filed in Hungary, while in 2016 this number was 71,247. The number of cases, trials, as civil trials, business trials, civil and business non-litigious cases, criminal trials, criminal non-litigious cases and trial cases at public administration and labour courts are assumed in Table 1. in order to follow-with the exception of one branch, the number of cases actually stagnates.

Table 1: Cases, trials 1990-2016

YEAR	Civil trials	Business trials	Civil and business non-litigious cases	Criminal trials	Criminal non-litigious cases	Trial cases at Public Administration and Labour Courts
1990	145 290	3 531	157 316	91 742	2 725	20 959
1991	150 694	3 413	172 424	111 671	2 562	28 253
1992	162 663	3 053	352 760	120 036	4 475	31 319
1993	182 703	17 227	462 891	118 829	3 065	17 394
1994	180 345	19 819	448 138	116 241	3 152	28 243
1995	182 065	22 725	397 232	113 294	2 664	14 458
1996	187 145	18 139	378 983	114 482	2 582	12 842
1997	195 957	19 539	341 927	121 296	2 454	13 318
1998	195 041	17 007	328 882	126 539	2 839	10 589
1999	166 981	15 189	337 930	124 868	4 478	11 490
2000	160 242	14 153	347 783	119 003	4 147	23 732
2001	158 486	14 172	363 681	116 056	3 356	26 099
2002	158 007	13 928	348 822	118 952	4 808	23 798
2003	151 204	13 329	331 601	120 962	5 179	29 801

YEAR	Civil trials	Business trials	Civil and business non-litigious cases	Criminal trials	Criminal non-litigious cases	Trial cases at Public Administration and Labour Courts
2004	154 067	13 612	306 928	91 910	41 540	28 856
2005	150 268	13 502	334 956	77 932	55 125	32 818
2006	148 180	13 415	391 954	75 708	55 447	27 903
2007	148 176	15 226	500 964	73 090	54 669	26 538
2008	158 558	16 764	538 364	76 589	56 446	24 086
2009	161 082	17 329	620 597	73 458	59 307	25 075
2010	168 045	15 217	375 981	80 155	64 265	26 745
2011	161 335	13 881	64 328	77 980	62 186	22 844
2012	143 904	12 324	61 521	70 886	58 838	18 299
2013	148 181	12 924	62 138	77 978	59 012	16 023
2014	147 428	10 900	62 019	58 944	78 074	14 186
2015	139 705	11 123	63 293	54 625	82 130	14 273
2016	148 279	9 478	71 247	55 681	76 159	13 477

Source: Hungarian Central Statistical Office, www.ksh.hu Decreasing number of civil and business non-litigious cases only. Civil trials (1), criminal non-litigious cases (2), business trials (3), criminal trials (4), public administrative and labour law trials (5) stagnate from (1)-(5).

Figure 1. presents the changes in cases, trials at hungarian courts between 1990-2016. The development of civil lawsuits between 1990 and 2016 can be said that as a result of the fall in the number of civil and business non-litigious procedures, the burden of the courts has been reduced from the year 2010 as depicted in Figure 3. Based on data about the cases, trials at hungarian courts provided by the hungarian Central Statistical Office it is clear that, in 2010, the total number of cases, decreased by 24% from 2009 to 2010. It is most affected by the legislative change that a major group of non-affiliated cases, payment orders are mostly made by notaries.

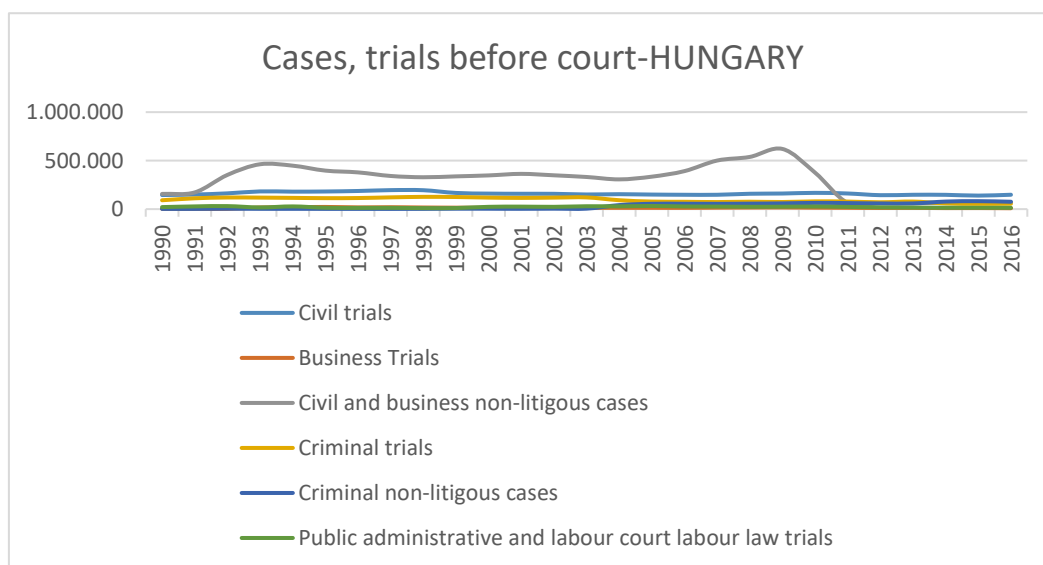


Figure 1. Changing of cases, trials at Hungarian courts 1990-2016

Source: Hungarian Central Statistical Office, www.ksh.hu Decreasing number of civil and business non-litigious cases only. Civil trials (1), criminal non-litigious cases (2), business trials (3), criminal trials (4), public administrative and labour law trials (5) stagnate from (1)-(5).

The numbers of incoming cases can not fully support changes according in the old statement according to the hungarian saying 'It is good to litigate'. Between 2010 and 2016, on the basis of data giving of registered mediators Table 2 shows the conformation of mediated cases, separately the cases with a successful agreement at the end and separately the cases without a successful end.

Table 2: Incoming cases to registered mediators at Ministry of Justice Hungary 2010-2016

	2010	2011	2012	2013	2014	2015	2016
successful	216	708	370	589	851	864	983
unsuccessful	63	203	160	204	260	487	400
all mediated cases	279	911	530	793	1111	1351	1383

Source: prepared by the author based on the given datas from Ministry of Justice, Hungary 2018

It is stated clearly in Table 2, that from the year 2014 there is a stable increasing in both – successfully and unsuccessfully completed incoming cases. Starting from the figures in the table, it is hoped that the number of people, firms or even communities that are choosing mediation will grow and overwhelm the old saying that 'It is good to litigate.'

TOOLS AND METHODS OF ALTERNATIVE DISPUTE RESOLUTION

To declare that the conflict is in all ways negative, bad, avoided, or is to be prevented and to be kept in secret –nowadays it is a direction beyond.

Conflict is often inevitable because it moves the change, triggers it and makes it possible to change. This approach can be passed, which categorizes conflicts as negative, avoided and in some ways bad.

Alternative dispute resolution methods can be applied individually, but together, in parallel, alternating one another. There are no two identical issues, cases so there is no pre-written and applicable scenario for each dispute settlement process. The knowledge of restorative, evaluative and transformative methods provides a good basis for keeping the mediation process as efficient as possible. Because the mediator does not work out the solutions, he or she is not the decision maker but is accountable to the procedure, say he or she is the manager of the procedure and the parties involved, even the owners of the case, the masters of the case. It is a basic human and social need that if unbalance, possibly shortage, damage (property, non-property), injury, interest arise in a relationship, it must be restored and the balance must be restored. The restorative method focuses on this issue. Reaserach and practice work long ago with restorative theory, in the filed of justice, as restorative justice on trial.

The conceptual growth of restorative justice may well gain from program specializations, such as dealing with special offenses, special group of offenders or particular mediation techniques. In criminal law though not perfect, probation's elasticity and position within community corrections underlines its ability to embrace, wholesale a restorative justice mission. Restorative justice should replace the retributive and (partly) the rehabilitative approach. After all, society has to keep a coercive system of reaction to offences, also when neither the restorative approaches nor the rehabilitative offers (which do not have to exclude the simultaneous reparative concerns as well) seems to be appropriate. (Messmer, Otto, 1991)

Evaluation is a method, enables the mediator judge. We evaluate a behavior, a situation, sentence, or even a person. Evaluation (ups and downs), the result of the rating is generally the same as a continuation: for a rating, the opposing party (or next to us) will most likely be rated as rating and so on. The nonviolent communication toolkit presents practices to avoid rating and

observation, focusing on objective communication. My point is that the evaluation method will always be present. Human nature is inherent in the evaluation and the classification, but the mediator should apply this method correctly and should use the transformational technique for the benefit of parties to achieve observation.

Critical issues are also formulated in relation to the evaluation method. (Stark, 1997) Advocates of a pure facilitative style maintain that evaluative mediation is oxymoronic. In their view, the essence of mediation lies in encouraging disputants' unfettered autonomy in the resolution of their dispute. Proponents of evaluative mediation counter that disputants often seek out the opinion of a neutral third party-that the mediator's opinion often helps, rather than hinders, the construction of settlements. Discussing how each disputant's position accords with existing social and legal norms makes for more informed decision making, and in the long run, more equitable agreements. Evaluative mediation is opposed to facilitative mediation. (Waldman, 1998)

Transformational method is a highly complex and nonviolent communication (NVC) that is most closely related to practice. It is based on the possibility of conflict as an opportunity to create a path to conflict. Let the relationship between the parties be better and more responsible than even before, to be considered as a challenge and a higher level of conflict resolution than before the conflict. Observation-based sentences can be used for transformation, understanding of the decisions, motivations and emotions of the other party or parties.

The transformation approach regards the conflict as the catalyzer of the progression. (Lederach, 2003) Transformative mediation is the newest concept of the three (see: facilitative, evaluative, transformative), based on the values of „empowerment“ of each of the parties as much as possible, and „recognition“ by each of the parties of the other parties' needs, interests, values and points of view. The potential for transformative mediation is that any or all parties or their relationships may be transformed during the mediation. Transformative mediators meet with parties together, since only they can give each other „recognition“. In some ways, the values of transformative mediation mirror those of early facilitative mediation, in its interest in empowering parties and transformation. In transformative mediation, the parties structure both the process and the outcome of mediation, and the mediator follows their lead. (Zumeta, 2000)

Worldwide, NVC (nonviolent communication) now serves as a valuable resource for communities facing violent conflicts and severe ethnic, religious, or political tensions. (Rosenberg M.B., 2015) Research deal with non-violence and pacifism in a row. It is worth to clarifying that, despite the tensions between peace researchers and peace activists noted above, the development of conflict resolution as a distinct field of academic enquiry with a strong praxis also owes much to non-violence and pacifist traditions. (Ramsbotham et al.,2011) Moreover research point out, that nonviolent communication facilitates the retrieval of the ethic of authenticity. (Nosek, M. 2012) Figure 2. presents the four-part non-violent communication which is the basis of a world wide taught communication process, which has two sides at each level with clear expressions and can guide persons to express *how they are* and can be used to emphatically recieve *how another is*. What I *observe*-what you observe; How I feel-how you feel; What I *need* or value that causes my *feelings*-what you need or value that causes your feelings and clearly *requesting* that which would enrich my life without demanding-emphatically recieving that which would enrich your life without hearing any demand.

Modern international conflict resolution offers a variety of tools to individuals, legal entities and management, and strongly encourages the emergence of conflicts, as effective conflict management not only affects the business and economic development and efficiency of the business, but also the stability and development of the national economy. (Nagy-Szilágyi 2012)

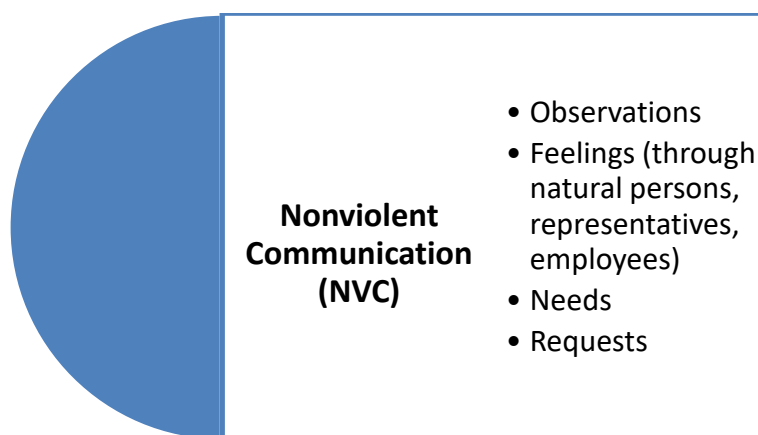


Figure 2. The four-part nonviolent communication process

Source: author's construction based on Marshall B. Rosenberg's 4 Part NVC Process

Conflict management is a creative activity that can be used to develop profitable professional levels for individuals, businesses and organizations, and focus on the dynamism and balance of conflict and harmony. In business, this is a forward-looking concept complemented by the claim that mediation is art. We know the relationship between creativity and art, but focus on business conflict management, business associations develop for profit, and look at the alternative dispute resolution approach with the process they are going to focus on in the way that this process can bring them the greatest benefit. The method of economic mediation must include the possibility to offer constructive solutions, react quickly, and provide more solutions for the future. In the process of negotiations and settlements leading to agreements, contracts, we often encounter similar sentences: "someone should let go from own aims", "compromise must be made", "each party should give up something to reach an agreement." The term compromise is not always coupled with a positive meaning, especially the business-oriented business. Instead of a compromise, the concept of consensus may be more advantageous in the field of alternative dispute resolution in private law and economic life-both theory and practice.

Common strategies a mediator might use during alternative dispute resolution in business to help the parties reach settlement include:

- Brainstorming new options;
- Questioning parties regarding the facts, law, interests strengths, and weaknesses of their case and the other party's case;
- Exploring non-monetary settlement options;
- Conditional demands and offers;
- Backwards bargaining;
- Decision tree analysis;
- Last best demand and offer;
- Best alternative to negotiated settlement;
- Mediator's proposal;
- Attorney-only sessions;
- Triangulating the gap;
- Apologies;
- Timing of payments. (Buyer, 2012)

Figure 4 intends to show the steps that are used in practice that will lead to conflict to connectivity through the expected results, the settlement. The ultimate goal of the mediation is for the parties to come to an agreement on a resolution. According to this the evolution of a conflict resolving do not end with reaching a solution, it is followed by a close, by a degree or a settlement in a written form, after conclusions have to be drawn. Only by finding a solution we can not be sure

at the same time, that we reached also a connection, but after the settlement and common drawing of conclusion it is more likely that the foundation of a connection is layed.



Figure 3: From Conflict to Connection

Source: Author

It should be emphasized that it is of great importance to meet different international actors in relations between legal persons. (Kr mer, 2004) 'Peace' is nothing more than a change in the form of conflict or in the antagonists or in the objects of the conflict, or finally in the chances of selection. (Coser, 1998) You have to be prepared to put the basics of dispute resolution into different approaches to different cultures, habits, law, business conduct, tradition, habit, and other regulatory tools. (Schuler, 2018) For this, it may be important for the expert to know the different nationalities, cultures, language skills and the established procedures for these, the techniques and methods that are developed for this environment. The tools of nonviolent communication are of paramount importance in mediation. Alternative dispute resolution should take particular account of the sentence-free formulation of words, sentences, or even gestures containing hidden judgment and evaluation, to decide on the success of a dispute. One sentence, one word can open a closed door, but vice versa is this formula, doors can close, walls can be drawn immediately by an evaluating, judgemental word or sentence.

CONCLUSIONS AND RECOMMENDATIONS

Alternative dispute resolution must have the particularity of counting not only on the internal affairs of the parties, but also on the other aspects of the case, including the judgment of the business partners, the judgment of the competitors, the judgment of the market and ultimately the whole case, the economic importance of the conflict and the impact of the conflict. This is in the interest of all parties. Consensus-building, the three basic mediation process techniques, the transformation which is often more than expected and suitable method, can provide a variety of assistance to this interest. The purpose of this presented paper was to describe these methods in the widest spectrum and provide an opportunity for the parties to participate in the choice of methods or in the area of their joint application.

The paper aims to show the importance of trust and peace and conflict management among not only indivisible human relationships, but also between business, legal, inter-state, working place,

public administrative, offender-victim, school (student-teacher; student-student; student-parents; parents-teacher), consumer, neighbour, community-social relationships. The result is that it is always necessary to examine the choice between tools and methods on a case-by-case basis. There is no need to choose between truth and conflict resolution, we can decide that both are the future. This research puts forward a future goal in which alternative dispute resolution methods would be organized on the basis of additional considerations and would examine the primacy of their use by type of case.

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MODELLING THE RELATIONSHIP BETWEEN CONSUMERS' FINANCIAL LITERACY AND THEIR USAGE OF RETAIL BANKING SERVICES

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Abstract: *The purpose of this study is to explain the relationship between consumers' financial literacy and their usage of retail banking services. According to the Organisation for Economic Co-operation and Development, financial literacy can be defined as a combination of awareness, knowledge, skills, attitude and behaviour necessary to make sound financial decisions and ultimately achieve individual financial wellbeing. Retail banking includes a wide range of banking services that belong to similar categories, such as savings accounts, personal loans, credit cards, debit cards, mortgages, e-banking services, insurance, etc. Therefore, the aim of the study is to investigate possible relationship between measured level of consumers' financial literacy and their usage of retail banking services. Usage of retail banking services is measured by total retail banking services usage score that represents the frequency of individual usage of various retail banking services, such as: various types of loans, various types of savings, banking on the move, debit cards, accounts, packaged bank accounts and other services. Based on the frequencies of using different banking retail services, we have identified basic, intermediate and advanced consumers of retail banking services. Financial literacy is operationalized through variables representing its key elements: financial knowledge, financial behaviour and financial attitude. Financial knowledge is measured by total financial knowledge score that was created by summarizing the number of correct answers on the financial knowledge test. Based on this score, we have identified consumers with below average, average and above average financial knowledge. This is a quantitative study, where we use non-probability sampling methods where participants are recruited by e-mail. To gain better understanding of relationship between consumers' financial literacy and their usage of retail banking services we use descriptive statistics, chi-square, t-test, correlation analysis and regression analysis. Possible limitation of examining relationship between consumers' financial literacy and their usage of retail banking services is the presence of probable endogeneity. Implications of this study suggest that usage of different retail banking services may be driven more by consumers' financial knowledge rather than their financial attitude and behaviour. On a policy level, the real implications of the research can be seen in the tailoring of particular financial literacy programs for individual consumers of retail banking services.*

Keywords: *measurement of financial literacy, retail banking services, bivariate and multivariate analysis*

JEL Classification: *D 14, C 83, C 10*

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INTRODUCTION

According to the Organisation for Economic Co-operation and Development (2011), financial literacy can be defined as a combination of awareness, knowledge, skills, attitude and behaviour necessary to make sound financial decisions and ultimately achieve individual financial wellbeing. On the other hand, retail banking includes a wide range of banking services that belong to similar categories, such as savings accounts, personal loans, credit cards, debit cards, mortgages, e-banking services, insurance, etc.

In this study we will try to explain relationship between those two concepts, i.e. measured level of consumers' financial literacy and their usage of retail banking services.

The research should result in responses to the following question: Is there a relationship between a consumers' financial literacy and their usage of retail banking services?

Having in mind the above said, the central research hypothesis shall be as follows: *Consumers' usage of retail banking services is driven more by their financial knowledge rather than their financial attitude and behavior.*

Possible limitation of examining relationship between consumers' financial literacy and their usage of retail banking services is the probable presence of endogeneity.

The results of this study could be a good starting point for creating and implementing financial literacy programs for consumers of retail banking services.

The paper is organized as follows. After the introduction, part one gives a short overview of theoretical framework of some recent literature that is relevant to the main objective of the paper. Part two outlines the data and research methodology. Part three is the center of the paper and contains analysis and discussion of the original empirical results. The last part contains some final remarks and conclusions.

THEORETICAL FRAMEWORK AND LITERATURE REVIEW

The central issue addressed in this paper is the relationship between consumers' financial literacy and their usage of retail banking services. So far, a significant number of scientific research has been conducted on the relationship between those two variables, so, the theoretical point of reference of this research will have its central foundation in preceding studies on measuring consumers' financial literacy and assessing the usage of bank retail services.

As pointed out by Lusardi (2008) financial literacy affects financial decision-making and ignorance about basic financial concepts can be linked to poor retirement planning, lack of participation in the stock market, and poor borrowing behavior. It is probably true to say that first results regarding measuring financial literacy can be found in the work of Lusardi and Mitchell (2009) and Lusardi (2008a, 2008b, 2012a, 2012b). According to Huston (2010) it seems that large body of financial literacy literature has been lacking in defining the concept of financial literacy. However, in this research we will use definition of financial literacy given by the OECD INFE (2011) and Atkinson and Messy (2012), where this concept is defined as a combination of awareness, knowledge, skill, attitude and behaviour necessary to make sound financial decisions and ultimately achieve individual financial wellbeing. Given their multidimensional nature, it is difficult to measure financial literacy with a single indicator. Therefore, we will measure financial literacy by using the following broad concepts (OECD INFE, 2011; Atkinson and Messy, 2011, 2012): financial attitude, financial knowledge and financial behaviour.

Retail banking provides financial services for consumers, with the focus on credit, deposit, and money management. When it comes to consumers' usage of retail banking services, the recent literature is mostly focused on identifying barriers to poor or insufficient usage of such services.

These barriers mainly refer to (Babajić, Okičić & Kokorović Jukan, 2018, p. 123): lack of trust in formal financial services and providers, cultural, social, and religious factors, lack of information on providers and services, underdeveloped delivery channels, lack of capital and limited financial capabilities, complex account opening procedure and financial knowledge. The recent results are indicating that (The World Bank, 2018), for example, 1.2 billion adults have obtained an account since 2011, including 515 million since 2014. Between 2014 and 2017, the share of adults who have an account with a financial institution or through a mobile money service rose globally from 62 percent to 69 percent. In developing economies, the share rose from 54 percent to 63 percent. In this research usage of retail banking services will be operationalized through their usage frequencies. Although the barriers to using retail banking services are beyond the scope of this paper, the above said definitely sheds light on importance and actuality of the topic. As mentioned before, in this study, the central issue addressed is the relationship between consumers' financial literacy and their usage of retail banking services. This concept is presented in Figure 1.



Figure 1 Theoretical concept

Source: Authors'

Examining the above presented relationship is necessary for creation of adequate financial literacy programs that can provide consumers with the knowledge they need to make sound financial decisions and secure their economic futures.

METHODOLOGY

Data source and sample

For the purpose of this research we used a non-probabilistic sample of individual users of retail banking services from Bosnia and Herzegovina. We used snowball sampling technique where participants are recruited by e-mail. The main criterion for the participant selection was usage of retail banking services. Contacts who decided to take part in the survey were asked to forward the request to their colleagues. The participation in the study was voluntary and anonymous. Table 1 gives brief overview of basic characteristics of the sample.

Table 1 Overview of basic characteristics of the sample

Characteristic	Frequency	Percent
<i>Gender</i>		
Male	60	60.0
Female	40	40.0
Total	100	100.0
<i>Current marital status</i>		
Unmarried/single	37	37.0
Married	57	57.0
Domestic partnership	2	2.0
Divorced	3	3.0
Separated	1	1.0
Total	100	100.0
<i>Education</i>		

Secondary education	20	20.0
Junior college (2-year university program)	13	13.0
University education, bachelor	48	48.0
University education, master's degree	15	15.0
University education, PhD	3	3.0
Missing	1	1.0
Total	100	100.0
<i>Living environment</i>		
Rural	32	32.0
Urban	67	67.0
Missing	1	1.0
Total	100	100.0

Source: Source: Author's calculation

The youngest respondent from the sample is 21 years old, and the oldest is 48 year old. Average age is 31.61 years with standard deviation of 6.11.

Variables

In this research two basic variables were used, i.e. *usage of retail banking services* and *financial literacy of the retail banking services users*.

Usage of retail banking services was measured by total retail banking services score. This score was obtained by summarizing the frequencies of individual usage of the following retail banking services:

- Various types of loans (cash loans, housing loans, loans in housing projects, allowed overdrafts, credit cards);
- Various types of savings (time savings, open savings, child savings);
- Banking on the move (Internet banking, mobile banking, ATMs, customer support);
- Debit cards;
- Accounts (current account, student account, giro account, teen account for youth, foreign currency account, savings account);
- Packaged bank accounts and
- Other services (permanent order, safeguards, Western Union).

Instrument used for measuring financial literacy (financial knowledge, financial attitude and financial behaviour) was mainly based on the OECD INFE Core Questionnaire (2011) and some previous work of Atkinson and Messy (2011, 2012) as well as Lusardi and Mitchell (2011).

Financial knowledge was measured by total financial knowledge score. This score was created by summarizing number of correct answers on the financial knowledge test that included following questions:

1. 1.000,00 BAM available today is worth more than the same amount in the future.
2. It is usually possible to reduce the risk of investing in the stock market by buying a wide range of stocks and shares
3. Suppose you put 100,00 BAM into a savings account with a guaranteed interest rate of 2% per year. You don't make any further payments into this account and you don't withdraw any money. How much would be in the account at the end of the first year, once the interest payment is made?
4. ... and how much would be in the account at the end of five years?
5. Imagine that the interest rate on your savings account is 1 percent a year and inflation is 2 percent a year. After one year, would the money in the account buy more than it does today, exactly the same or less than today?

6. Do investments with higher expected returns come with more risk?
7. Does high inflation mean that the cost of living is increasing rapidly?

Other two components of financial literacy, i.e. financial behavior and financial attitude, were measured by using 5-point Likert scale, ranging from 1 (“Strongly Disagree”) to 5 (“Strongly Agree”). Financial attitude and behaviour were measured by using following statements:

1. I consider myself a thrifty person.
2. I believe that one need to live today, without thinking about tomorrow.
3. I think I need to give the best of me so my family could have a better life someday.
4. I find it more satisfying to spend money than to save it for the long term.
5. I tend to live for today and let tomorrow take care of itself.
6. Before I buy something I carefully consider whether I can afford it.
7. I pay my bills on time.
8. I maintain my financial affairs.
9. I set long term financial goals and strive to achieve them.

Methods

To gain better understanding of relationship between consumers' financial literacy and their usage of retail banking services we use descriptive statistics, chi-square, correlation analysis and regression analysis. Possible limitation of examining relationship between those two concepts is the presence of possible endogeneity. Financial literacy, as an endogenous variable, has already been recognized in the research of Van Rooij, Lusardi and Alessi (2011), Van Rooij, Kool and Prast (2007) and many others.

Research design

The research is organised in three phases. The first phase brings an analysis of basic parameters of descriptive statistics of the selected variables. These results have been considered of immense importance in terms of proper understanding of specificities of the sample. In the second phase, we will use chi-square test and T-test to examine the difference in the characteristics different groups of respondents. In the last phase, the empirical results of potential relationship between consumers' financial literacy and their usage of retail banking services have been presented.

RESULTS AND DISCUSSION

Descriptive statistical analysis

Table 2 contains short overview of the results of frequency of using selected retail banking services.

Table 2 Overview of the frequency of using certain retail banking services

Usage of retail banking services		Frequency	Percent
Various types of loans (cash loans, housing loans, loans in housing projects, allowed overdrafts, credit cards)	Yes	30	30.0
	No	70	70.0
	Total	100	100.0
Various types of savings (time savings, open savings, child savings)	Yes	26	26.0
	No	74	74.0
	Total	100	100.0
Banking on the move (Internet banking, mobile banking, ATMs, customer support)	Yes	57	57.0
	No	43	43.0
	Total	100	100.0
Debit cards	Yes	74	74.0
	No	26	26.0

	Total	100	100.0
Accounts (current account, student account, giro account, teen account for youth, foreign currency account, savings account)	Yes	87	87.0
	No	13	13.0
	Total	100	100.0
Packaged bank accounts	Yes	18	18.0
	No	82	82.0
	Total	100	100.0
Other services (permanent order, safeguards, Western Union)	Yes	18	18
	No	82	82
	Total	100	100.0

Source: Author's calculation

Based on the frequencies of using different banking retail services, we have identified following categories of consumers (Table 3):

- *Basic* – those consumers that are using at least two banking services;
- *Intermediate* – those consumers that are using exactly three banking services and
- *Advanced* - those consumers other are using more than three retail banking services.

Table 3 Category of consumers of retail banking services

Category	Label	Frequency	Percent
1	Basic user of retail banking services	33	33.0
2	Intermediate user of retail banking services	35	35.0
3	Advanced user of retail banking services	32	32.0
	Total	100	100.0

Source: Author's calculation

According to the empirically assessed financial knowledge score, we have identified following categories of users of retail banking services (Table 4):

- *Consumers with below average financial knowledge* – those who had maximum 5 correct answers on financial knowledge test.
- *Consumers with average financial knowledge* – those who had 6 correct answers on financial knowledge test.
- *Consumers with above average financial knowledge* – those who had more than 6 correct answers on financial knowledge test.

Table 4 Category of financial knowledge

Category	Label	Frequency	Percent
1	Below average financial knowledge	36	36.0
2	Average financial knowledge	34	34.0
3	Above average financial knowledge	30	30.0
	Total	100	100.0

Source: Author's calculation

Figure 2 shows grouped bar chart for each categorical group.

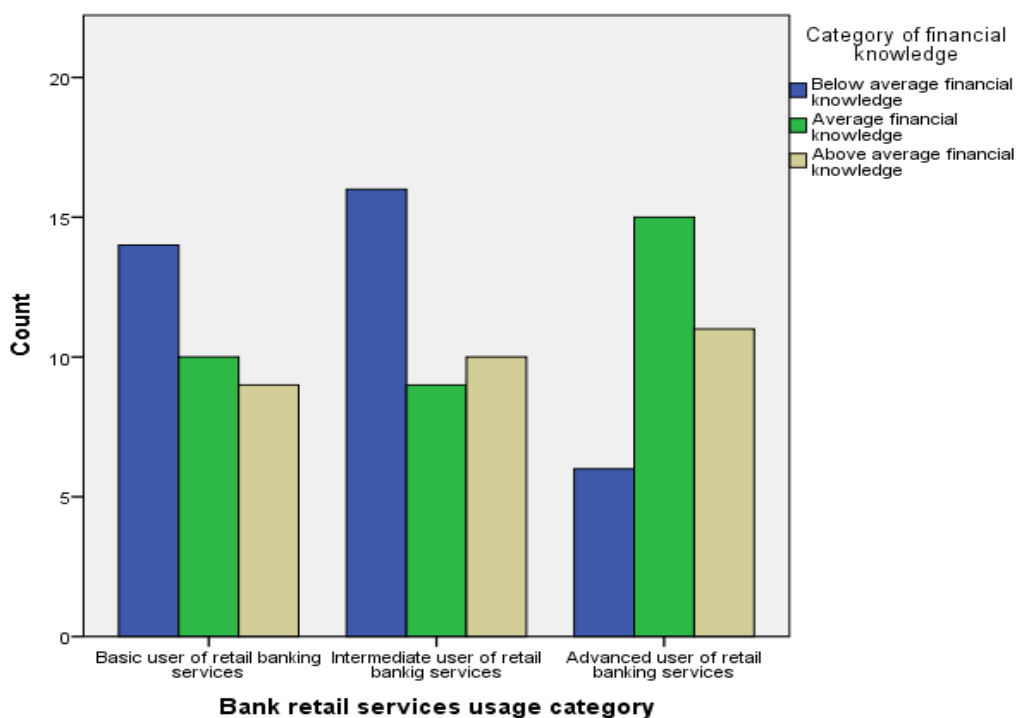


Figure 2 Category of financial knowledge vs. category of usage of retail banking services
Source: Author's calculation

Other two components of financial literacy are financial attitudes and financial behaviour of retail banking services users. Their descriptive statistics is given in Table 5.

Table 5 Descriptive statistics for financial attitudes and behaviour

Component	Label	Mean	Standard deviation
Financial attitude and behaviour	I consider myself a thrifty person.	3.60	1.12
	I believe that one need to live today, without thinking about tomorrow.	2.19	1.01
	I think I need to give the best of me so my family could have a better life someday.	4.27	.89
	I find it more satisfying to spend money than to save it for the long term.	2.79	.92
	I tend to live for today and let tomorrow take care of itself.	1.93	.95
	Before I buy something I carefully consider whether I can afford it.	3.99	.93
	I pay my bills on time.	4.36	.95
	I maintain my financial affairs.	4.37	.88
	I set long term financial goals and strive to achieve them.	4.09	1.01

Source: Author's calculation

Financial attitude and behaviour scale appeared to have good internal consistency, $\alpha=.806$.

Examining the potential relationship between consumers' financial literacy and their usage of retail banking services

Next step in the analysis is to examine potential relationship between consumers' financial literacy and their usage of retail banking services.

Based on the results of the correlation analysis, evidence of positive statistically significant correlation between financial knowledge score and frequency of using retail banking services, $r=.269$, $p=.007$ has been detected.

Also, evidence of a statistically significant difference between the financial attitude and behaviour score and usage of the following retail banking services has been found:

- Various types of loans (cash loans, housing loans, loans in housing projects, allowed overdrafts, credit cards), ($t(100) = 3.194$, $p = .002$);
- Accounts (current account, student account, giro account, teen account for youth, foreign currency account, savings account), ($t(100) = -2.507$, $p = .042$).

Evidence of a statistically significant difference between the financial knowledge score and various types of savings (time savings, open savings, child savings), ($t(100) = -2.839$, $p = 0.006$) has also been found.

Furthermore, multiple regression analysis was used to test if financial literacy significantly predicted consumers' frequency of using retail banking services. The results of the regression analysis indicated the financial literacy poorly explained only 7.3% of the variance ($R^2=.073$, $F(2) = 3.808$, $p=.026$). It was found that financial knowledge significantly predicted consumers' frequency of using retail banking services ($B=.300$, $p=.007$). No evidence was found supporting the claim that financial attitudes and behaviour significantly predicted consumers' frequency of using retail banking services ($B=.005$, $p=.852$).

CONCLUSIONS AND RECOMMENDATIONS

To sum up, the analysis results have revealed that consumers' usage of banking retail services is driven more by their financial knowledge rather than their financial attitude and behaviour. The results of this study indicate that financial knowledge significantly predicted consumers' frequency of using retail banking services. This leads to the conclusion that targeted financial literacy programs can help consumers by providing them with the knowledge they need to make sound financial decisions and secure their economic wellbeing. The goal is to make a positive change in consumers' financial behaviour.

However, this empirical research was conducted on a relatively small sample size and the limited territory of Bosnia and Herzegovina. Hence it, in order to obtain reliable and more relevant data regarding the relationship between consumers' usage of banking retail and their assessed level of financial literacy, research should include a larger number of respondents.

Also, further research suggests a need for more in depth analysis of relationship between consumers' usage of banking retail and their assessed level of financial literacy with focus on dealing with potential endogeneity issue.

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GLOBALIZATION AND REGIONALIZATION

INSTITUTIONS OR CULTURE: ALTERNATIVE OR COMPLEMENTARY EXPLANATIONS OF ECONOMIC GROWTH?

Boris Begović¹

Abstract: *The paper comparatively explores institutions and culture as two fundamental explanations of economic growth and to answer the question whether and to what extent they are alternative or complementary explanations. Both notions are precisely specified, with all three specific elements of culture (beliefs, values and preferences), minimising the space for overlapping between them in terms of economic outcomes. The difference between them, as culture deals with motives of human behaviour, has more variety in a society and its traits are more persistent, due to intergenerational transmission, while institutions deal with constraints to human interactions, have less variety and are less persistent. Two-way interaction between institutions and culture, with one being endogenous to the other, is explored, with some of the mechanisms of causality being identified. The joint influence of institutions and culture, i.e. of incentives and motives, with the possibility that motives can be endogenous to incentives, are explored, with specific cases of superadditivity (synergy) and subadditivity generating countervailing effects to the economic outcomes. The countervailing effects of religion, as a set of cultural traits, on economic growth are notified and their mechanisms are explored, revealing a mechanism of Weberian argument of Protestant ethics. The findings of contemporary growth theory regarding the dominant engines of growth provide explanation of the change with the distance to the technological frontiers, with the dominant engine of growth being investment-based growth for countries far from the technological frontier, and innovation-based growth for countries close to that frontier. It is institutions that are crucial for investment-based Smithian growth, and culture for innovation-based Schumpeterian growth. Accordingly, both institutions and culture have substantial impact on economic growth and they are not alternative, but complementary explanations of economic growth, with their relative importance changing with the distance from the technological frontier. The joint dynamics of institutions and culture, as factors of economic growth, provide a ground for promising theoretical and empirical research with focus on two issues. One is the causality from institutions/culture to economic growth, focusing on empirical research, with more data and more sophisticated econometric techniques now available. The other one is the interaction between institutions and culture, with economic history as probably the best source of information about these interactions.*

Keywords: *Institutions, culture, economic growth, motives, incentives*

JEL Classification: *O43, Z10, Z12*

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INTRODUCTION

The advent of the theory of economic growth is based on the simple and elegant model of exogenous growth (Solow, 1956), which clearly and precisely describes the mechanics of growth, specifies the steady state, and identifies factors that influence the rate of transitory growth. The main finding of the model is that in the steady state the economic growth rate equals the rate of the exogenous technological progress. Although the model provided a starting point for most models in the field of growth theory, especially the empirical (e.g. Barro, 1991), and even though it introduced the notion of absolute and conditional convergence, it provided no insight into the determinants of technological change: the factors that increase or decrease the rate of technological progress remain unknown. This main drawback of the model has been corrected with the advent of models of exogenous economic growth, both of them: one based on horizontal innovation (Romer, 1990) and the other based on vertical innovation, a Schumpeterian model of growth (Aghion and Howitt, 1992).

Even though these models have provided ample insight into the mechanics of economic growth and even mechanics of innovation and technological progress (via allocation of resources to research and development), in the case of models of endogenous growth, they did not provide a fundamental explanation of economic growth. The point is that growth, at least in market economies, depends on numerous uncoordinated decisions of individuals, i.e. economic agents, to do something: to save, to invest, to innovate, or to increase efficiency. The crucial question is why economic agents behave in the observed way, and why in some societies they save, invest and innovate, and other societies they do not or if they do, they do it at the substantially lower relative level. Using contemporary terminology (Acemoglu and Robinson, 2012), the question is why some nations fail, and some do not.

In short, this is a question about the fundamental explanation of economic growth, boiling down to consistent explanation of the behaviour of economic agents. The debate in the past several decades has formulated two basic answers to this question: (1) It is institutions, with two sub-versions: one is the top-down approach (Acemoglu *et al.*, 2005), and the other is the bottom-up approach (Grief, 2006); and (2) It is culture (Landes, 1998, Spolaore and Wacziarg, 2013, and Mokyr, 2017).

The aim of this paper is to comparatively explore these two fundamental explanations of economic growth and to answer the question whether and to what extent these explanations are alternative or complementary. If they prove to be alternatives, then the issue of their relative superiority would be explored. Such an aim mandates the following structure of the paper. First, a precise definition of the two notions will be reached, producing the specific difference between them. This is an especially important first step, since a substantial part of the disagreement in literature is not a disagreement at all but rather misunderstanding due to non-standard definition of the main notions, especially culture. Then, motives of and constraints to human behaviour, created by institutions and culture, are examined, as they proved to be crucial in the explanation of the behaviour of economic agents. This is followed by the examination of the different engines of economic growth, with insight into the relative importance of these engines at various distances of the country from the technological frontier, exploring the relative impact of appropriate institutions and culture on economic growth at different distances to the technological frontier. Finally, this is followed by the conclusion.

THE IMPORTANCE OF BEING PRECISE: THE PROBLEM OF DEFINITIONS

The very notion of institutions and especially culture is rather vague, especially about the scope of the phenomena that should be included in the notion. The basic definition of institutions is now widely accepted as “the humanly devised constraints that structure political, economic and

social interactions. They consist of both informal constraints (sanctions, taboos, customs, traditions, and code of conduct), and formal rules (constitutions, laws, property rights” (North 1991, p. 97). In short, institutions “are the rules of the game in a society...that shapes human interaction” (North, 1990, p. 3).

There are several relevant issues related to this notion. First, institutions are only constraints to the maximising of the behaviour of individuals and what these individuals maximise does not depend on institutions and differs from one individual to the next. Second, there are both formal and informal institutions serving the same purpose – providing constraints. Third, the sanction for breaching institutions, i.e. breaching rules of the game, are external in the case of laws and social norms, or internal, in the case of morality, i.e. the self-imposed code of conduct. Fourth, they are humanly devised, meaning artificial, but the way how they are established is not specified. Finally, institutions are rules of the game irrespective of what is the name of the game. It could be anything: North (1991) refers to political, social and economic interactions constrained by institutions, Acemoglu *et al.* (2005) distinguish between political and economic institutions, with political determining economic, but also there are legal institutions, i.e. rules of legal process, that can be identified (Dam, 2006, La Porta *et al.*, 2008).

Taking all this into account, it is obvious and relevant for the consideration of economic outcomes of the institutions that they create incentives, effectively sanctions for breaking the rules of the game – generally these incentives are negative. Institutions can consistently explain why individuals are not doing what they are not doing, but they cannot, other than by method of elimination, explain why they are doing what they are doing. In short, institutions and the incentives that they create are not about the individual’s motives, as they do not deal with the preferences of individuals: they are only constraints in maximising the behaviour of individuals. What each individual maximises, i.e. what are the arguments of his/her utility function, what are his/her preferences, is exogenous to institutions.

Furthermore, institutions only address the individual’s interactions with other people; they are about human interaction, i.e. the exchange, direct or indirect. It is not concerned with basic human motives, or about human behaviour in relations with the nature (God is included in the concept of nature used in the literature), but only about interaction with other people – they are not about the individual’s internal life.

With institutions specified in rather precise way, what remains is to provide an appropriate definition of culture. From the economic outcome perspective it should be accepted that “Culture is a set of beliefs, values and preferences, capable of affecting behaviour, that are socially (not genetically) transmitted and that are shared by some subset of society” (Mokyr 2017, p. 8).

Mokyr (2017, p. 8) also provides specifications for all three mentioned elements of culture. “Beliefs contain statements of a positive (factual) nature that pertain to the state of the world including the physical and metaphysical environments and social relations”. Furthermore, values pertain to normative statements about society and social relations (often as ethics and ideology) and preferences are normative statements about individual matters, such as consumption and personal affairs.

Important point Mokyr (2017, p. 9) is that culture is something “entirely of the mind” and that can differ from one individual to another and is, to some extent, “a matter of individual choice”, as opposed to institutions, which are, save self-imposed codes of conduct, given to every individual and are beyond their control. Hence in a society there could be only one institutional set-up, at least in the case of formal institutions, but a variety of cultures embodied in each individual that is a member of the society.

In exploring relations and possible overlapping between culture and institutions, the focus should be on the elements of culture. Beliefs, as the first element of culture, have nothing in common with institutions, as beliefs contain positive statement (true or false), effectively the knowledge used by an individual in the utility maximisation process. It has nothing to do, at least not directly, with the interaction of individuals, i.e. exchanges. Preferences, third element of culture also have nothing in common with institutions. Although preferences are normative statements, they are about individual matters (consumption and personal affairs), not human interactions.

However, since values, as the third element of culture, pertain to normative statements about society and social relations, including, as pointed out by Mokyr (2017), ethics and ideology, it overlaps with institutions in two ways. As already pointed out, informal institutions of self-imposed codes of conduct, basically an ethical constraint, are founded on the values to which an individual subscribes. The constraint enforcement process is internal, based on the personal decisions of the individual, and the sanction is also internal (feeling of guilt, in terms of consciences, or sin). However, these codes are constraints to human behaviour in exchange, i.e. in interaction with other humans – a definition of institutions. Furthermore, trust among people is based on individual beliefs about the reality. Although beliefs as such are not institutions, beliefs about the behaviour of other people can produce trust, which is, or at least can be, a substitute for institutions. In other words, if the trust is subnational, transaction costs are lower, and the level of exchange is higher for a given institutional constraint, as demonstrated by Guiso, Sapienza and Zingales (2009). So, these are obvious cases of overlapping of the roles of culture and institutions.

More profound, nonetheless, is the influence of values, an element of culture, on institutions. In this sense, culture is the “scaffolds” of institutions, as pointed out by North (2005). This notion brings up the issue of dynamic relations between culture and institutions and implies that there is a direction of influence from culture to institutions. Nonetheless, as demonstrated by Alesina and Giuliano (2015), the relations between culture and institutions are much more complicated and causality goes both ways, referring to the Putnam (1993) prominent study that the medieval institutional set-up of Italian regions (the existence of free cities) has influenced the level of social capital, considered as culture, i.e. explains the variance of social capital across modern Italy. The problem with Alesina and Giuliano (2015, p. 902) approach is that they “prefer the term culture over informal institutions; we find it more appropriate and less confusing” and “we...refer to formal institutions simply as institutions”. Accordingly, their insightful paper is a contribution about mechanics of interrelations between two types of institutions, formal and informal, about two types of constraints to human behaviour, not about the relations between the constraints (institution) and driving force of such behaviour (culture). Nonetheless, the idea that preferences, as an indisputable element of culture, are exogenous to economic institutions is rather well established and supported by some evidence (Bowles, 1998).

In addition to the content and effects, persistence is another important issue related to the distinction between institutions and culture. Roland (2014) suggests that culture is nothing other than “slow-moving institutions”, which “change slowly and continuously”, which affects political and legal arrangements which can move faster, i.e. “fast-moving institutions”, those that “change rapidly and irregularly”. The bottom line is that this distinction between informal and formal institutions, both affecting interaction of individuals, with deeply imbedded institutions, i.e. culture for the author, is more persistent, or more resilient, considered from the other viewpoint. Though the confusion about the distinction between culture and institution is increased by this contribution, it provides a clear time-frame distinction between the more persistent culture and less persistent institutions.

This distinction is in line with the definition of culture provided by (Guiso, Sapienza and Zingales, 2006) which defines culture as “those customary beliefs and values that ethnic religious

and social groups transmit fairly unchanged from generation to generation” (p. 23). Since this kind of vertical transmission provides very moderate room for change, culture has the propensity to be more persistent in time, i.e. more resilient than institutions. This was vividly demonstrated in Guiso, Sapienza and Zingales (2016), which demonstrated that variation of the level a cultural trait, civic capital, across Italy can be explained by the variation of the medieval institution of free cities that disappeared long time ago. A similar conclusion has been reached regarding the institutional heritage of the Hapsburg Empire (Becker *et al.*, 2013), which vanished a century ago. The problem arises because for some rules of the game to be considered as institutions they must have some persistence/resilience, otherwise they will not be effective constraints. That concern, together with hardly understandable ambition to distinguish between institutions and economic policies, has led to the requirement that institutions must be “permanent and stabile” (Glaeser *et al.*, 2004), hardly a useful guidance for persistency.

Taking into account all the reviewed insights, it is reasonable to distinguish culture from institution in such a way that culture deals with the basic motives of individuals, which influence their behaviour (choices) regardless of other people, has more variety in a society, and its traits relatively more persistent, while institutions deal with constraints, though with a slight overlap with culture, influence interaction among people, i.e. exchanges, have less variety in a society, and are relatively less persistent.

With the basic distinction between culture and institutions sorted out, attention can be turned to the motives (created by culture) and constraints (created by institutions) to human behaviour.

MOTIVES AND CONSTRAINTS TO HUMAN BEHAVIOUR

All three elements of culture influence the motives of human behaviour. Preferences do that in a self-explanatory way, as they formulate the utility function of each individual. Beliefs are important because these insights enable individuals to formulate the aims that should be accomplished for the utility to be maximised. Finally, values, as normative statements embedded in morality, provide the grounds for the selection of aims, i.e. makes it possible to distinguish what is “forbidden fruit”.

The role of the constraints, created by incentives, is rather straightforward. When the constraints are broken, sanctions follow, and this enables the individual, to make a rational calculation, with given motives that are specified as aims, about their behaviour and to make choices accordingly. A change in motives, with fixed incentives, brings on the change of behaviour, as does the change of incentives, with fixed motives. The crucial question, however, is whether motives and incentives are interrelated and, if the answer is yes, in which way. Specifically, the question is whether motives are endogenous to incentives. In a seminal study of the relation, Bowles (2016) formulated a theoretical model in which motives and incentives relate to each other in basically three ways.

The first one is a special case that motives are exogenous to incentives and there is just additivity of their effects, motives and incentives work independently of each other. Then, there are basically two cases of endogeneity of motives. One is the case of superadditivity, i.e. crowding in (synergy): incentives reinforce motives and the joint effect of the two of them on the economic outcome is more than just the addition of the effect of one to the effect of the other. For example, labour contracts are incomplete, the incentives they create are not perfect for reaching Pareto optimality, but they reinforce work ethics based on the motives that working hard has its intrinsic value, e.g. the Protestant work ethics, and the economic outcome is better than just separate effects of incentives and motives.

The other case of interaction is the case of subadditivity, i.e. crowding out (negative synergy): the case when incentives undermine motives. Hence, incentives have countervailing effects in

such a situation: the indirect effects of incentives undermine their direct effect. If there is a strong crowding out, the economic outcome is worse than the situation when incentives are not introduced at all. This is the bottom line of the Haifa case (Gneezy and Rustichini, 2000): when a fine was introduced for parents who are late for collecting their children from the kindergarten, the parents started to collect their children even later than before.

Generally, for economic outcomes, most important are the motives linked to hard work and innovation. Perhaps the most widespread argument of this kind is the Weberian argument about the Protestant preferences for hard work and success in current life. As demonstrated by Hillman and Potrafke (2017), these preferences, predominantly among Calvinists, are the consequence of the concept of predetermination, anxiety regarding uncertainty of the exogenous outcome (whether someone's soul will go to Heaven or Hell), with Calvin professes that believers are obliged to believe that they are among the chosen ones, whose soul will be saved, and that work is pleasing to God. Accordingly, people should devote themselves to productive work even if they are already wealthy. The Weberian argument is based the concept of Protestant ethics against the background of certainty of salvation in the Catholic world (endogenous, due to confession and absolution) with ethics of hard work being instrumental to eschatological reasons.

Regardless of the extent to which the Weberian argument is convincing and successful in explaining recorded economic outcomes, especially compared to the human capital related hypothesis (Becker and Woessmann, 2009), it is evident that among different people there are different work ethnics, i.e. motives related to hard work. These differences can be attributed to religious and confessional differences, but also on quite secular beliefs concerning income-generating process, basically to what extent high income can be obtained through hard work, and there is substantial economic literature on that (Alesna, Glaeser and Sacredote, 2001, Benabou and Ok, 2001, Benabou and Tirole, 2006). The bottom line of this analysis is a belief in work-versus-luck regarding the source of income generation and economic success. Doepke and Zilibotti (2008) use two cultural traits, two beliefs, work-versus-luck attitude and the importance of thriftiness, to explain industrialisation and the demise of landed gentry, as the middle-class family's cultural traits (hard work and thriftiness as priorities) were completely distinct from those of the aristocracy and their refined taste for leisure and used these beliefs to explain the industrial revolution and economic progress of the time.

It is evident that appropriate beliefs can substantially increase the productivity of labour and consequently total factor productivity. But culture also affects innovation. Mokyr (2017) demonstrated that substantial cultural change in Europe after medieval times (the change that liberated science from religious dogma) allowed for the growth of useful knowledge and technological progress based on scientific breakthroughs, rather than on artisanal trial-and-error method of improvement, which had been the source of the slow medieval technological progress. This breakthrough provided the grounds for the industrial revolution. This was not a sufficient condition for this revolution, but it was definitely a necessary one. Furthermore, recent empirical investigation (Benabou, Ticchi and Vindigni, 2015) have demonstrated that religious dogma is still a factor influencing innovations, with the results of empirical research at the individual level (based on the results of the five waves of the World Values Survey) being conclusive that greater religiosity “was almost uniformly and very significantly associated to less favourable views of innovation”. That complements the results of the previous research (Benabou, Ticchi and Vindigni, 2013) that countries with higher religiosity recorded lower levels of patents *per capita*, a clear indication that innovation activity is lower in these countries. Accordingly, cultural traits linked to religiosity undermine the motive for innovations.

Contrary to that, it has been both theoretically and empirically demonstrated (Gorodnichenko and Roland, 2017) that dominance of individual culture over collective one is more innovation-friendly, and thus beneficial for innovation-based economic growth. The main mechanism of

motivation deals with the social status rewards associated with innovations in individualistic culture. Nonetheless, two-way causality between institutions and individualistic/collective culture has been identified, with a variety of economic outcomes.

Without culture focused on the motives of individuals, economic growth cannot be successfully explained solely by institutions, as the same institutional set-up can lead to the different economic outcomes. The natural experiment of transition and the transfer of a substantial number of institutions, both political and economic, to the countries of Central and Eastern Europe have not produced the same political and economic outcomes as in Western Europe. This variance of the outcomes can be explained by culture, although informal institutions (considered by many as culture) have also had their impact. This natural experiment is symmetrical to the two – North and South Korean (Acemoglu *et al.*, 2005) and Nogales, USA and Nogales, Mexico (Acemoglu and Robinson, 2012) – same culture with different institutions – used as a crucial evidence that institutions rule, and not culture. The evidence from Central and Eastern Europe demonstrated that things can go the other way. Nonetheless, it would be flawed to claim that culture rules.

That being said, for the time being it is evident that these explanations are complementary, and not alternative fundamental explanations of economic growth. Now, taking into account the changing roles of engines of growth with the change in the distance to the technological frontier, it is time to explore the relative significance of both culture and institutions.

ENGINES OF GROWTH: CHANGING OF PRIORITIES WITH DISTANCE FROM TECHNOLOGICAL FRONTIER

There are basically two engines of economic growth: the accumulation of production factors, i.e. their investment into production, and the increase of total factor productivity (TFP), due to improvements in efficiency and due to technological progress, i.e. innovation. The accumulation of production factors is crucial for growth at lower levels of economic development, i.e. for growth of countries that are far from the technological frontier, since many production factors, especially labour, are not utilised at all, capital is scared due to the low income and low savings rate, and in such a framework, marginal productivity of investments is rather high. That is good for both economic growth and for investors, since high returns provide strong incentives for investments to materialise. The problem with this mechanism of growth is that it is not sustainable. As it has been demonstrated (Solow 1956), the accumulation of production factors can accomplish only transitory economic growth. When the steady state is achieved, due to the inevitable equalisation of the investment rate and the depreciation rate, i.e. when capital per labour is constant, economic growth depends only on the increase of the TFP, due to the technological progress that is exogenous to the model.

A crucial prerequisite for this type of economic growth, i.e. investment-based growth, are high expected investment returns, as only such returns provide incentive for investment. If returns are low, or if the probability of returns and/or investments expropriation is high and consequently expected returns are low, this provides weak or no incentive for investors to invest physical capital. It is appropriate institutions, e.g. rule of law, that protect private property rights, decreasing the probability of expropriation, either by private or government predators, consequently increasing expected returns and therefore boosting investments and speeding up investment-based economic growth. Furthermore, institutions that protect contractual rights decrease transaction costs and enable the increase of exchange, consequently increasing efficiency due to the division of labour, materialisation of economies of scale and competitive pressure, which increases production efficiency. In short, appropriate institutions are a prerequisite for Smithian economic growth. The importance of culture for this growth is secondary. It is not that hard work and thriftiness ethics are not important, or that culture in the cases of self-imposed codes of conduct does not facilitate exchange, but generally institutions are

the main (though not the only) fundamental explanation of investment-based growth, the only available option for countries that are far from the technological frontiers.

As already pointed out, the increase in the TFP has two main sources. One is inefficiency, which can be eliminated for a given technology. The main issue with increased efficiency as the source of TFP growth is that it is a one-off event: the reallocation of resources from low-productivity to high-productivity activities can be done only once – it is not sustainable. The only sustainable increase of the TFP is based on technological progress, i.e. innovations that improve the technology that is used in production. If a steady state is achieved, the growth rate is equal to the technology progress rate. Modern economic growth theory considers technological progress to be endogenous, based on research and development (R&D) or, only locally, based on the adoption of existing but superior technology, i.e. technology from the technological frontier. For a country/industry that is close to the technological frontier, the only mean of technological progress, and in that way improved TFP, is own R&D, and technological innovation as its outcome. This is the essence of Schumpeterian growth, the only available option for countries close to the technological frontier.

An appropriate culture is a crucial prerequisite for innovations, as already demonstrated in this paper, based on previous contributions, predominantly Mokyr (2017). Although appropriate institutions, those that protect intellectual property rights and those that enable free flow and exchange of ideas, contribute to innovation by providing funding for R&D, without innovation-friendly culture nothing can be achieved – innovation-based growth would simply run out of steam. In that sense, culture is a more important fundamental explanation of economic growth of the countries close to the technological frontiers.

Acemoglu *et al.* (2006) pointed out that institutions suitable for investment-based growth are not suitable for growth based on innovations, focusing on the changing of competition policy and its enforcement. Nonetheless, this insight can be further developed by modifying it to include both culture and institutions. Accordingly, institutions are the primary fundamental explanation of economic growth based on investments, growth in countries far from technological frontier, and culture, although relevant is only secondary. Contrary to that, culture is the primary fundamental explanation of economic growth based on innovation, growth in countries close to the technological frontier, and institutions, though relevant are only secondary.

In short, the primary fundamental explanation of Smithian growth is that it can be attributed to institutions, and the primary explanation of Schumpeterian growth is that it can be attributed to culture.

CONCLUSION: COMPLEMENTARY AFTER ALL?

As pointed out by Bisin and Vedier (2017) there is as “strange culture” (*sic*) of the search for unique causal effect in economics, i.e. a search for only one fundamental explanation of such a complex outcome like economic growth. Accordingly, the “either/or” framework is applied to the debate on culture, institutions, human capital, geography, etc. Nonetheless, this approach seems hardly promising for better understanding the fundamentals of such a complex outcome such as economic growth. Not only for that reason, institutions and culture are not alternative fundamental explanations of economic growth.

The review of arguments in this paper has demonstrated that both institutions and culture have substantial impact on economic growth. This impact is based on their simultaneous influence on human behaviour and the decisions of individuals, which are the foundation for economic growth. In some cases, culture and institutions can reinforce their effects on the economic outcome, and in others they can have countervailing effects. The impact can also be indirect as substantial interrelations between culture and institutions have been identified, with two-way

causality: culture can influence institutions, “scaffolds of institutions”, and institutions can influence culture. Finally, the relative importance of culture and institutions can change with the distance from the technological frontier.

Obviously, the dynamics and especially the joint dynamics of institutions and culture, as fundamental explanations of economic growth, provide a fertile ground for promising theoretical and empirical research, with two special topics. One is the causality between culture and/or institutions and the economic outcomes, i.e. economic growth, with more data and more sophisticated econometric techniques available. The other one is the area of interrelations between institutions and culture, about which we should learn more through surveys, experiments and history. History remains the best source of information for this kind of research, it that could be economic historiography new task, or the task may be taken over by the disappearing discipline of comparative economics. One way or the other, the future of this kind of research is definitely certain.

If an agreement is reached on the definition of the most important notions and related taxonomies (along the lines of Popperian methodological nominalism), the future debate should focus on disagreements and comparative evaluation of exhibits in favour and against some hypothesis, not on sorting out misunderstandings among the academics involved. The intellectual efficiency of the debate would be substantially enhanced.

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INSTITUTIONS AND INEQUALITY

Vadim Kufenko¹

Abstract: *Many countries had been experiencing a rise in inequality during the last decades. Among the potential causes of the increase in inequality are institutions. The findings in modern literature point out at bi-directional relationship between both: in some studies, institutional arrangements clearly have a causal impact on inequality, whereas in other studies findings suggest the reverse. In the given work modern findings with respect to formal and informal institutions are considered with a focus on political institutions, taxation, labour market institutions and coercion and informal institutions. It follows that the majority of studies report a one-directional causality from institutions to inequality. A full awareness of the given institutional effects may help to offset the increases in inequality and mitigate their negative consequences.*

Key words: *inequality, institutions, taxation, labour market, informal institutions, overview*

JEL Classification: *D02, E02, D63*

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INTRODUCTION

Inequality has been rising since the middle of the 20th century in many countries (Piketty, 2014): in the 2000s the share of the richest 1% in the OECD countries has risen to around 10-15% or 10-15 times their share of the population. Inequality is a multidimensional phenomenon involving income, wealth, education and health – the rise in inequality is obvious, yet the reasons are still discussed, with institutions being one of the most often mentioned drivers of inequality. The main goal of the given paper is to provide an overview of the most recent findings on the interplay between institutions and inequality.

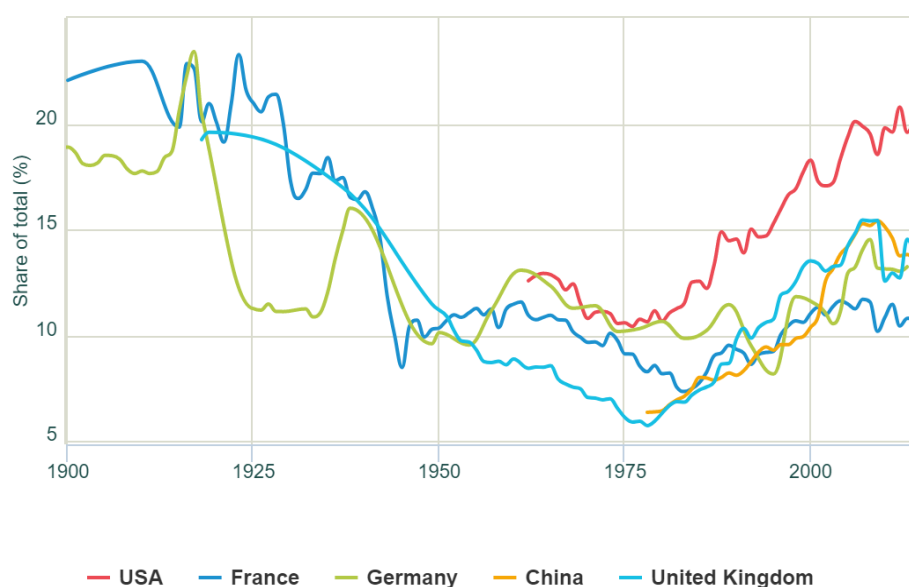


Figure 1. Top 1% income share (%)

Source: wid.world

Institutional economics has been one of the most fruitful fields in Economics as a science since the publications of Douglas North, offering institutional explanations to numerous economic and social phenomena. Diverse formal and informal institutions, as “the rules of the game” (North, 1990), have been in focus of theoretical and empirical works. Whereas in the field of economic theory the causal effect of institutions can be modelled in a straightforward way, applied econometricians struggled with endogeneity and measurement errors. Surprisingly, in the theoretical literature often both directions of causality between institutions and inequality are modelled, whereas in the empirical literature, mostly the causal impact of institutions on inequality (and not the other way around) is taken into consideration. Nevertheless, some influential works highlight the interplay and note causality in both directions (see Chong and Gradstein, 2007).

The purpose of this paper is to look at diverse findings on the interaction between institutions and inequality, available in the modern literature.

POLITICAL INSTITUTIONS

One of the first attempts to bring institutions into the discussion on inequality was Kuznets (1955), where based on the data during industrialization a concave relationship between income and inequality was postulated. Bearing in mind the criticism by other researchers (see Barro, 2000), such a relationship should not be considered as a regularity or a universal one, yet, it was the first step towards highlighting the role of institutions. Moreover, Piketty (2014) postulates an inverse U-shape relation, observed in the 20th century. It follows, that according to the initial

concept, during industrialization an income differential between rural and urbanized areas rises and consequently, following urbanization, the gap decreases. Whereas according to Kuznets (1955) structural change is driving the rise in inequality, institutional changes are contributing to its decrease. The institutions in question are mainly related to formal policies and redistribution. Acemoglu and Robinson (2002) offered the so-called “political Kuznets curve” with three scenarios for the relationship between income and inequality: monotonic linear, concave and convex. In all three cases formal institutional arrangements are responsible for redistribution: inequality in capital accumulation can be decreased by inclusion of the poor in the political processes. In the monotonic linear scenario inclusion does not take place, whereas in the concave scenario the rich are pressured to share the decision-making power with the poor. Although the mechanisms behind the inclusion can be debated, empirical research finds signs of a relationship between democratization and inequality (see Chon, 2004 and Tam, 2008). One has to note that if democratization can help to decrease inequality through political inclusion of representatives of the middle and the low income groups, there will be a number of constraints imposed on tax setting. One of those constraints, is related to tax competition.

REDISTRIBUTION POLITICS AND TAX COMPETITION

Although not an institution itself, tax competition is rather a phenomenon, reflecting the complicated tax-setting process in the modern globalized environment. Referring to taxation, one has to bear the Laffer curve in mind: a concave relation between tax revenues and tax rates can be reasonably modelled for a number of OECD countries (see Trabandt and Uhlig, 2011 and Heijman and Ophem, 2005). Capital mobility changes the shape of the Laffer curves and the optimal tax rate would shift, as well as the policy-making frontier. A tax rate above the optimum one would be associated with decreasing tax revenues. If a country wishes to adopt a tax increase to foster redistribution, it must take tax rates in the neighboring countries in consideration. Thus in game-theoretic terms, the reaction function of policy-makers would not only consist of national variables, but also tax rates of closest competitors – countries with lower tax rates, where the firms or rich taxpayers could move. Moreover, in tax competition, leaders may emerge with other countries adopting certain strategies as followers (Hindriks and Nishimura, 2015). Therefore, the international and also intra-national tax competition puts an additional substantial constraint on redistribution politics (see Seelkopf and Lierse, 2016). Redistribution and taxation schemes are just one of the formal institutions, which can influence inequality. Another way to examine the interplay between institutions and inequality is to draw the attention to the factor markets and the formal institutions, related to them.

LABOUR MARKET INSTITUTIONS AND BARGAINING

Labour market institutions may have a substantial impact on income distribution and are decisive for labour income of the low-skilled. For example, the minimum wage is meant to have a double-sided effect: “A higher minimum wage compresses the distribution of earnings, which tends to reduce the Gini coefficient, but raises unemployment, which tends to increase it” (see Checchi and Garcia-Penalosa, 2010, p. 436). Other labour market institutions, which have an impact on inequality are the strictness of employment protection law, unemployment benefit duration, unemployment benefit generosity (Koeniger, Leonardi and Nunziata, 2007). Bargaining institutions, such as labour unions, are on the nexus between policies and the labour market. Labour unions are known to have a similar effect as the one of the minimum wage, however Farber, Herbst, Kuziemko and Naidu (2018) note that throughout the second half of the 20th century labour unions had equalizing effects on the distribution of wages in all the US states. Moreover, the union wage premiums for the low-skilled seem to be higher offering better protection for those groups according to the latter study. However, since the 1990s due to globalization the bargaining power of the employers had been increasing, whereas the union

membership and power had been decreasing (Gaston, 2002). However, globalization is not the only factor amplifying the effects of the decline of centralized bargaining institutions: Another important factor is automation. Prettnner (2017) notes that approximately 14% of the decline of the decline in labour share in the US can be attributed to automation, which is expanding at an exponential pace. Bearing in mind the declining bargaining power of the employees, globalization and automation may contribute to the rise in inequality, especially referring to the low-skilled workers, whose real wages had not been experiencing substantial increases for decades. A modern debate on the issue of automation and inequality is becoming more relevant and issues like taxation of robots (Gasteiger and Prettnner, 2017) are being widely discussed.

LABOUR COERCION

History offers numerous examples, using which one can illustrate the impact of institutions on inequality. Most of the related works are empirical and focus on a one-way long-run causality, yet acknowledging the possibility of a reverse effect. An important insight is related to labour market frictions, such as labour coercion as in Acemoglu and Wolitzky (2011). Even milder versions of labour coercion, such as regional monopsonies (see Barr and Roy, 2008), can lead to lower wages and discouragement in accumulation of human capital in the affected commuting areas. Throughout history, labour coercion became milder, evolving from slavery and serfdom to regional monopsonies and monotowns. Malinowski (2016) notes that serfdom in the 16th-18th century Poland enabled the landlords to levy high monetary and labour duties to their enserfed tenant farmers could hinder economic development and make the enserfed farmers more vulnerable. Markevich and Zhuravskaya (2018, p. 1113) note that the abolition of serfdom in the 19th century Russia had a substantial positive effect on agricultural productivity, industrial development, and peasants' nutrition in nineteenth century Russia. The latter effect is supported by an anthropometric analysis, showing that after the emancipation of labour the average height of draftees increased. Dell (2010) analyzed the long-run effects of labour coercion in the mining industry in Peru: although the "mita" regime existed in Peru throughout the 16th-19th centuries, the areas affected exhibit substantially lower household consumption and higher stunting in children. In the latter work land tenure, public goods provision and market participation were noted as channels through which the "mita" regime influenced economic agents.

An interesting point could be made about institutional regimes. Crafts and Mills (2009) show the dissolution of Malthusian effects (positive and preventive checks) in pre-industrial England. The traditional view on the Malthusian effects is that these were largely driven by land scarcity, yet many findings (for example, see Haines, 2000) indicate the presence of Malthusian effects in frontier economies, with land abundance. Geloso and Kufenko (2015) show that the tenure regime in Quebec could partly be responsible for the Malthusian effects and their dissolution: after the British conquest in 1760 and the subsequent changes in land ownership legislation and the abolishment of tenure, the Malthusian effects dissolved. One has to note that the institutional changes in Quebec were rather gradual and other effects, including market integration, contributed to the dissolution of the Malthusian effects.

INFORMAL INSTITUTIONS

Rule of law and corruption had been one of the most often mentioned informal institutions. Indeed, a society with weak rule of law and high corruption would most likely favor the rich, who would exercise political power and lobby their interests, whilst fostering the rise of inequality. Gupta, Davoodi and Alonso-Terme (2002) picture such a scenario and find the related effects in the empirical data: in their study, corruption is directly associated with inequality. Policardo and Carrera (2018) find an opposite direction of causality in their panel data: Inequality is associated with corruption. The authors thus claim, that corruption is a reaction to the unequal

income distribution. The interplay between corruption and inequality can be complicated in terms of empirical analysis because once we allow for income to be formal and informal, measurement issues arise: Kar and Shrabani (2012) claim that alternative redistribution mechanisms within a shadow economy may exist. Implications of informal institutions can be even more far-reaching and may manifest themselves in income mobility across generations: Bourdeaux (2014) notes that corruption and property rights are strongly related to intergenerational income mobility. Thus, for example, high levels of corruption are associated with high income persistence between different generations and less social mobility.

Family formation patterns, e.g. assortative mating, is another vivid example. Assortative mating is related to mating of people from the same social groups. Family formation also means pooling of the resources in one house – thus, if the rich would marry the rich, and the poor would marry the poor, inequality would hardly decrease. Greenwood, Gruner, Kocharkov and Santos (2014) find their US sample, that if mating would be purely random the Gini coefficient would decrease from 0.43 to 0.34 and thus income and wealth would be less concentrated. Other studies find that this family formation pattern does not have a substantial impact on inequality (Breen and Salazar, 2011).

CONCLUSIONS

Although the causality between different institutions and inequality is still subject to debate, clearly an economically and statistically significant relationship can be found in the modern literature. Modern economic literature tends to focus more on formal institutions (political mechanisms, taxation, labour market institutions, labour coercion) and less on topics related to informal institutions (corruption and mating). The reason for the latter is understandable, since informal institutions are harder to measure. With a full awareness of the findings from the literature on the interplay between institutions and inequality, policy-makers would be able to pin-point potential problems and take actions to slow the increases in inequality, which one observed during the last decades, and mitigate the negative consequences of these increases.

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FINANCING OF DEVELOPMENT AND REGIONAL INNOVATIVENESS IN POLAND

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Abstract: *This paper considers the very important issue of financing the development as well as innovativeness of regions in Poland. Poland's economy with particular attention given to its innovation strategy. The aim of the article is to show the mechanisms which serve to finance the development and innovativeness of regions in Poland, with special consideration to possibilities of using the European Funds for this. For the needs of the conducted research, two following theses were adopted: the European Funds contribute significantly to the growth of competitiveness, raising the standards of living and the development of innovations in individual regions of Poland, and there are substantial differences among regions in Poland in terms of their innovativeness level. The purposes to which the European Union allocates its funds are closely related to the development strategies. The current strategy is defined in the document "Europe 2020". Moreover, detailed plans of allocating the EU funds, the Multiannual Financial Framework, are created for the period of at least 5 years. The cohesion policy is one of the basic Community policies. According to it, the European Union tries to promote the harmonious development and innovativeness in the whole territory of the Community by means of activities focused on the reduction of inequalities in the development levels of its individual regions, and thus to reinforce its economic, social and territorial cohesion. The study of the economy innovativeness on the local level (years 2014-2016), due to the availability of statistical data, is possible only with regard to product and process innovation, that is why only those categories were adopted for the analysis. A set of entities to assess the innovativeness of the economy are enterprises which in the studied period introduced at least one product or process innovation to the market (a new or significantly improved product or a new or significantly improved process).*

The major thesis of the paper argues that the development of innovativeness of the Polish economy requires structural, institutional, and especially financial changes in the long run. The structure of the article is as follows: the introduction is followed by an assessment of the different sources of financing development and level of innovativeness of Poland's economy, explanation of the reasons and methods of financing development and innovativeness, and then the conditions for innovation in Poland (especially in regional dimension) are outlined with particular emphasis on strategic aspects and the final part presents synthetic conclusions derived from the analysis.

Keywords: *Innovativeness, development, financing,*

JEL Classification: *O11, O19, O31, O32*

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INTRODUCTION

Among the European Union countries differences in the level of socio-economic development in individual member states and their regions are visible. These disparities, depending on the region, are a result of an unfavourable location, adverse environmental conditions, low population level, high dependence of regions on collapsing industry sectors, poor development of infrastructure, including communication and transport network, and impediments in the access to modern techniques and technologies. The existence of these disparities is perceived as an disadvantageous phenomenon which limits the possibilities to implement the principle of free competition, which leads to difficulties in the stable and harmonious development of the whole European Union. Therefore, within the policies being implemented, numerous activities are undertaken which aim at the improvement of the social and economic situation in the poorest regions via the creation of the instruments of financing their development and the growth of innovativeness (Ciupek, Znanięcka, 2010, p. 123).

The European Union as an international organization has its own budget at its disposal. In accordance with it, activities striving for solving common problems of the member states are financed. Owing to one budget, such activities are cheaper and more effective than separate actions implemented by each country on its own. Thus, for more than 40 years the European Union has been conducting active regional development policy (also called the cohesion policy or the structural policy), whose most important aim is to diminish discrepancies in the development of countries and regions, and, what follows, raising the attractiveness of the member states and the Community itself on the global market (European Funding, 2017).

In this context, the aim of the article is to show the mechanisms which serve to finance the development and innovativeness of regions in Poland, with special consideration to possibilities of using the European Funds for this. For the needs of the conducted research, two following theses were adopted: the European Funds contribute significantly to the growth of competitiveness, raising the standards of living and the development of innovations in individual regions of Poland, and there are substantial differences among regions in Poland in terms of their innovativeness level.

The analysis was conducted based on the statistical data characterising the studied problems, as well as the authors' own research.

THE EUROPEAN FUNDS AS A SOURCE OF FINANCING THE DEVELOPMENT OF ECONOMIES AND REGIONS

The purposes to which the European Union allocates its funds are closely related to the development strategies. The current strategy is defined in the document "Europe 2020". Moreover, detailed plans of allocating the EU funds, the Multiannual Financial Framework, are created for the period of at least 5 years (European Funding, 2017).

"Europe 2020" strategy was passed by the European Council on 17 June 2010 for the years 2010-2020. It is the follower of the Lisbon Strategy effective by the end of 2010, whose aims were not fully accomplished, and its effectiveness was considered as slight. Therefore, "Europe 2020" was a response to the weaknesses of the European economy which became manifest during the 2007-2009 economic crisis. The strategy addressed the challenge, which was a change in the direction of policies from crisis management to implementation of reforms of growth and employment, both in the medium and long term, as well as guaranteeing the stability of public finance (Tracz-Krupa, 2015, p. 59).

The programme of "Europe 2020" strategy includes three key priorities (Tracz-Krupa, 2015, p. 59):

- 1) intelligent development - development based on knowledge and innovation,
- 2) sustainable development - effectively supporting economy deriving from resources and more and more competitive,
- 3) development conducting social inclusion - supporting economy with high employment level, enabling the development of social and territorial cohesion.

"Europe 2020" concentrates on five developmental goals to be completed by 2020 (European Commission, 2017):

- 1) employment – 75% people aged 20-64 should be in work,
- 2) research and development – 3% of the EU's GDP should be invested in R&D
- 3) climate change and sustainable energy use – greenhouse gas emissions should be reduced by 20% (in the case of favourable conditions by 30%) in comparison with 1990 levels,
- 4) education - rates of early school leavers should be below 10% and not more than 40% people aged 30-34 should have higher education completed,
- 5) fighting poverty and social exclusion - the number of people at risk of digital exclusion or poverty should decrease by at least 20 million.

To implement the assumptions and postulates of the strategy, the Multiannual Financial Framework (MFF) has been developed, which is a tool of assigning a financial dimension to the EU priorities. MFF sets bases for annual budgets and are not as detailed as the budgets: only maximum annual amounts (the ceilings) for the expenditure of the European Union as a whole and for the leading product categories are established (European Union, 2017).

MFF are also called financial perspectives, and their main aim is to control the EU expenditure in order to maintain the balance of its budget (European Funding, 2017). MFF are established for at least 5 years, in practice usually for 7 years, and they have been functioning in the European Union since 1988 (European Union, 2017):

- 1) financial perspective 1988-1992 – was concentrated on the establishment of the internal market and the consolidation of the multiannual framework programme of research and development,
- 2) financial perspective 1993-1999 – focused on social policy and cohesion, as well as the introduction of Euro,
- 3) financial perspective 2000-2006 – was devoted to the extension of the European Union,
- 4) financial perspective 2007-2013 – prioritized permanent economic development and competitiveness in order to create new jobs,
- 5) financial perspective 2014-2020 – focuses on the transition to low-emission economy in all sectors, promotion of the adjustment to climate change, environmental protection and promotion of sustainable transport and removal of the shortages of capacity in the functioning of the most important network infrastructures.

In practice, the European Union spends the money planned in the budgets through different funds, programmes and financial instruments. At present, based on the goals of "Europe 2020" strategy, the economic development of the member states is supported by 5 major funds:

- 1) European Regional Development Fund,
- 2) European Social Fund,
- 3) Cohesion Fund,
- 4) European Agricultural Fund for Rural Development,
- 5) European Maritime and Fisheries Fund.

In addition to the above-mentioned funds, there are investment funds functioning in the Community: European Union Solidarity Fund and the Instrument for Pre-Accession Assistance, financial instruments: JASPER, JASMINE, JEREMIE and JESSICA, as well as various EU initiatives (European Funding, 2017). For the absorption of money from the EU funds there are

national and regional operating programmes. The regulations concerning the operation of funds are common for all the states and are supposed to guarantee the use of the funds in compliance with "Europe 2020" strategy, as well as of the synchronization and coherent implementation of ventures, and possibly the least complicated access to funds for potential beneficiaries.

The principles of the functioning of the funds at the same time refer to the regional policy principles:

- 1) the principle of partnership - all interested parties should cooperate on each stage of the fund implementation, starting from the preparation of venture projects and ending with the fund spending,
- 2) additionality principle (cofunding and supplementing) - funds should be the supplement of individual member states' own funds, not their replacement,
- 3) subsidiarity principle - higher level authorities should not interfere in the goal accomplishment process, as long as it is possible to implement them to the sufficient extent by lower level authorities,
- 4) decentralisation principle - local and regional governments deal with the fund implementation as they know local needs and problems, and, what follows, their activities are more effective,
- 5) concentration principle - the EU funds support specific, priority spheres,
- 6) programming principle - the functioning of funds is based on multiannual programmes of economic development, prepared in accordance with the partner process of making decisions by the entities they concern,
- 7) the territorial dimension of regional policy - funds support not only administrative territories but also those functionally interrelated, that is those which have similar socio-economic-spatial qualities and the same developmental goals.

To sum up, the European Union member states have a possibility to make use of financial assistance. At the same time, they are obliged to apply guidelines when spending the funds. The money from the shared European Union budget is spent by means of various funds, whose goals must be coherent with the European Union development strategy. The member states are obliged to transfer the Community strategic goals to the domestic conditions.

THE USE OF THE EUROPEAN FUNDS AS A SOURCE OF FINANCING THE DEVELOPMENT AND GROWTH OF REGIONS

The cohesion policy is one of the basic Community policies. According to it, the European Union tries to promote the harmonious development and innovativeness in the whole territory of the Community by means of activities focused on the reduction of inequalities in the development levels of its individual regions, and thus to reinforce its economic, social and territorial cohesion (Poździk, 2008, p. 13).

The aims of the cohesion policy are subject to modifications each time in the subsequent budget periods (European Funding, 2017):

- 1) 2000-2006:
 - a. support for underdeveloped regions,
 - b. reconstruction of areas dependent on collapsing branches of economy,
 - c. modernisation of the labour market,
- 2) 2007-2013:
 - a. convergence,
 - b. regional competitiveness and employment,
 - c. European territorial cooperation,

3) 2014-2020:

- a. investment in growth and employment,
- b. European territorial cooperation.

Regional development in the European Union nomenclature is understood as the process of any changes which take place in the region. It can consist in positive changes (progressive development), but also negative ones (regressive development) (Kosiedowski, 2005, p. 20). Regional development is the phenomenon of complex, dynamic and long-term character. It requires the engagement of factors, both internal ones, being at the disposal of the region, and the external ones, which arise, for example, from the style of conducting the state development policy or the Community regional policy. Regional development includes (Stahl, Jaworska-Dębska, 2010, p. 204):

- 1) permanent development,
- 2) economic development (human capital, innovative base, potential to create and absorb innovation, region design, quality of transportation infrastructure, institutional conditions, agglomeration benefits),
- 3) social development (improvement of the living conditions of the region inhabitants, liquidation of poverty zones, improvement of inhabitants' health and living conditions),
- 4) sustainable development.

Innovative activities in the region are, on the other hand, works related to the preparation and launch of the manufacturing of new or improved materials, goods, devices, services, processes or methods, intended to be introduced to the market, or to another use in practice. Innovative activity is also raising the organisation and management level, increasing the effectiveness of economic ventures and the quality of their results. Innovative activities or supporting innovativeness are also understood as raising the level of schooling and education, development of infrastructure, particularly IT infrastructure, standardisation, normalisation activity, as well as activity for the protection of industrial and intellectual property, increasing the efficiency and quality of the activity of public services, particularly those acting for health and environment protection, preventing the results and events posing risks for life and property. In another approach, this is a view of innovation as creative changes in the social system, in the economic structure, in technique and in nature (Popławski, Polak, 2011, p. 108).

According to the nomenclature mentioned above and referring to the development and innovativeness in regions, the European Union specifies in detail which region can obtain EU funds for those aims. The division of those funds takes place based on the GDP value in a given region. Regions in which GDP per capita is lower than 75% of the average in the European Union qualify to be supported. In addition to this criterion, the amount of funds allocated to individual states depends also on other factors and is always an object of negotiations with the European Commission (Ministry of Development, 2017). The condition for obtaining the EU assistance by individual countries is signing Partnership Agreement with the Commission, which is the most important document defining the strategy of allocating funds in a given country. It is the determinant of strategic goals and investment priorities of the country, which relates them at the same time to the objectives of "Europe 2020" strategy (European Funding, 2017). In the years 2004-2006 Poland obtained 12.8 billion Euros, in the years of the financial perspective 2007-2013 it was 67.3 billion Euros, and for the years 2014-2020 the amount of 82.4 billion Euros was allocated (Tomaszewska, 2017, p. 236).

The allocation of the funds gained takes place by means of operational programmes which support the development, in the first place, of voivodeships, poviats and municipalities, financing investments in, among others, road infrastructure, health care, culture, education, tourism, environmental protection or sport, as well as technological research and development, and

innovation and entrepreneurship (Imiołczyk, 2010, p. 44). Therefore, the group of major beneficiaries include territorial governments, which treat the EU funds as a possibility to accelerate the development process in various spheres of their activity (Rajca, 2014, p. 36).

The Operational Programmes (OP) mentioned above aim at the implementation of the National Development Plan. Their scope can be varied: they can include the whole country (national programmes), individual voivodeships (regional programmes) or a specific sector of economy (sectoral programmes). In each programme there are specific types of ventures which can be co-financed and entities which can apply for financial support (the Sejm of the Republic of Poland, 2017). Operational Programmes define the strategy of development and a coherent set of priorities which are supposed to be accomplished with the European Fund (Szuszman, 2017).

The programmes are implemented through subsidizing by one or a few structural funds, financial instruments or the European Investment Bank. A programme financed by more than one structural fund is defined by an integrated operational programme (Ryszkiewicz, 2000, p. 48).

For each financial perspective separate operational programmes are created. They can constitute completely new directions of support or be a continuation of directions from the previous perspective (PARP - Polish Agency for Enterprise Development, 2017).

Within the perspective for the years 2004-2006 7 programmes functioned (European Funding, 2017):

- 1) Integrated Regional Development Programme (2.97 billion Euros),
- 2) Sectoral OP Human Resources Development (1.47 billion Euros),
- 3) Sectoral OP Enterprise Competitiveness Growth (1.25 billion Euros),
- 4) Sectoral OP Transport (1.16 billion Euros),
- 5) Sectoral OP Restructuring and Modernization of Food Sector and Rural Development Programme (1.19 billion Euros),
- 6) Sectoral OP Fisheries and Maritime (0.2 billion Euros),
- 7) OP Technical Assistance (0.03 billion Euros).

In the programming period 2007-2013 there were 16 regional programmes created (one per each voivodeship, 17.3 billion Euros), 4 national and 1 supraregional, and there were also funds from the European Territorial Cooperation:

- 1) PO Infrastructure and Environment (28.3 billion Euros) – its aim was an improvement in the investment attractiveness of Poland and its regions owing to the development of technical infrastructure, with the simultaneous protection and improvement of the condition of the environment, health, retaining cultural identity and the development of territorial cohesion,
- 2) OP Human Capital (10 billion Euros) – aimed at the growth of the level of employment and social cohesion by reduction of the areas of social exclusion, professional activation, increasing the level of the education of society, developing adaptation potential of enterprises and their workforce, as well as support for the mechanisms of effective management in public administration,
- 3) OP Innovative Economy (8.7 billion Euros) – supported widely understood innovativeness (both to the domestic and international scale) leading to the development of the Polish economy, activities aiming at an increase in the innovativeness of enterprises, the role of science in the economic development and the share of innovative Polish products in the international market, the growth of competitiveness of Polish science and the use of information and communication technologies in economy, as well as the creation of permanent and better jobs,
- 4) OP Eastern Poland Development (2.4 billion Euros) – was of a supraregional character, and was addressed to 5 voivodeships of Eastern Poland: Warmian-Masurian, Podlaskie, Lublin, Podkarpackie and Świętokrzyskie, as to the areas less developed than the remaining part of the

country. Within this programme, projects significant for the socio-economic development of those regions were implemented,

5) OP Technical Assistance (0.5 billion Euros) – was responsible for the effective implementation of the assumptions of spending the EU funds, lack of delays in their payment, as well as providing reliable information about the co-financing requirements,

6) European Territorial Cooperation (0.7 billion Euros) – included a lot of programmes which could be divided into three types: cross-border cooperation programmes, transnational cooperation programmes, and interregional cooperation programmes. It was important to ensure that the venture partner came from abroad.

For the years 2014-2020 16 regional programmes were launched (31.15 billion Euros), 5 national programmes and 1 supraregional one, and, just like in the previous years, funds were made available within the European Territorial Cooperation (European Funding, 2017):

1) OP Infrastructure and Environment (27.4 billion Euros) – supports low-emission economy, energy security, development of technical infrastructure and environmental protection,

2) OP Intelligent Development (8.6 billion Euros) – focuses on scientific research, innovative technologies and an increase in the SME competitiveness,

3) OP Knowledge Education Development (4.7 billion Euros) – co-finances activities in education, healthcare, higher education, professional activation of people under 30, and social inclusion,

4) OP Digital Poland (2.2 billion Euros) – aims at an increase in the availability of the Internet, development of IT technologies, the spread of the ability to use a computer and the Internet, and raising the role of e-services in administration,

5) OP Eastern Poland (2 billion Euros),

6) OP Technical Assistance (0.7 billion Euros),

7) European Territorial Cooperation.

Some of the programmes launched in the years 2014-2020 are the prolongation of programmes from the previous perspective 2007-2013. The relations are presented in Figure 1.

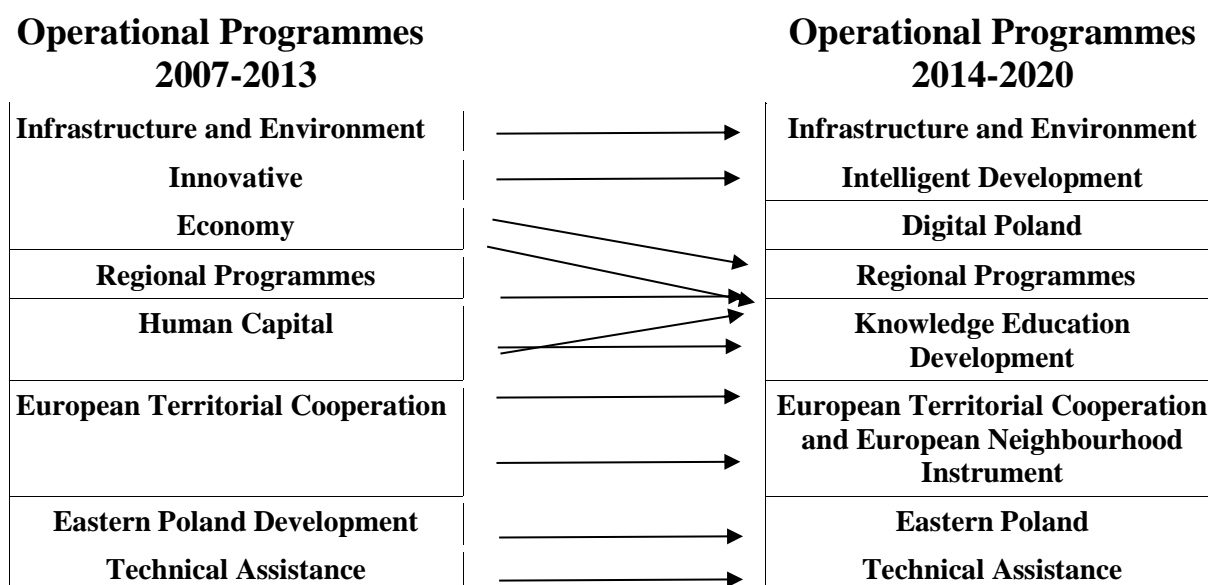


Figure 1. New and continued Operational Programmes in the 2007-2013 and 2014-2020 perspectives

Source: Churski, 2016.

In both perspectives Regional Programmes are responsible for the development of individual regions. In their case, the funds are managed by local government institutions, that is, voivodeship boards (European Funding, 2017). In addition to the aforementioned operational programmes, in each of the perspectives there is Rural Development Programme functioning in Poland, operating in the agricultural, forestry and rural areas sector, as well as programmes supporting maritime and fishery policy (2007-2013: OP FISHERIES, 2014-2020: OP Maritime and Fisheries).

INNOVATIVENESS OF REGIONS IN POLAND IN THE YEARS 2014-2016⁴

According to Oslo methodology, innovation is the implementation of a new or significantly improved product (good or service) or process, new marketing method, or a new organizational method in business practices, workplace organization or external relations.⁵ In principle, we can distinguish product, process, marketing or organizational innovations. The study of the economy innovativeness on the local level, due to the availability of statistical data, is possible only with regard to product and process innovation, that is why only those categories were adopted for the analysis. A set of entities to assess the innovativeness of the economy are enterprises which in the studied period introduced at least one product or process innovation to the market (a new or significantly improved product or a new or significantly improved process).

In the years 2014-2016, innovatively active industrial or service enterprises were, respectively, 20.3% and 14.5% of the overall number of those enterprises, and the highest percentage of innovatively active entities occurred among entities with 250 and more workers. In the years 2014-2016, the share of innovative industrial enterprises was 18.7%, and of service enterprises – 13.6%. In the case of industrial enterprises the value was higher by 1.4 percentage points than in the previous years, and for service enterprises - by 3.9 percentage points. Similarly to the previous years, product or process innovations were most often introduced by entities with the number of workers 250 and more (58.7% of industrial enterprises and 42.3% of service enterprises).

In the analysed period the share of industrial enterprises innovatively active and innovative in industrial processing was highest in the section *Manufacture of pharmaceutical products*. In the previous research period the share was the highest in the section *Manufacture of coke and refined petroleum products*. Just like in the previous studied period, among service enterprises the share of service enterprises both among enterprises innovatively active and innovative was highest in the section *Insurance, reinsurance and pension funding*.

Considering the territorial division, the highest percentage of innovatively active industrial enterprises was noticed in Lesser Poland Voivodship (23.7%), and innovative ones -in Lublin Voivodship (22.5%), whereas of innovatively active and innovative service enterprises in Lublin Voivodship (23.6% and 23.3%, respectively).

The analysis of the results confirms the diversity in the voivodship approach to the innovation level among enterprises. The distance between the highest and the lowest value of the percentage of industrial enterprises in voivodships was 9.0 percentage points, whereas in the case of service enterprises it was 18.5 percentage points.

⁴ The analysis of the innovative activity of enterprises in Poland in the years 2014-2016 was conducted based on the data included in the publication : *Działalność innowacyjna przedsiębiorstw w Polsce in the years 2014-2016 [Innovative Activity of Enterprises in Poland in the Years 2014-2016]*, Central Statistical Office, Statistical Office in Szczecin, Warszawa – Szczecin 2017.

⁵ *Podręcznik Oslo. Zasady gromadzenia i interpretacji danych dotyczących innowacji* (2008). Warszawa: OECD, Eurostat, Ministry of Science and Higher Education, Warszawa 2008, p. 48.

The share of net revenues from the sales of new or significantly improved products launched to the market in the years 2014-2016 in total sales revenues in 2016 was 8.1% for industrial enterprises. The highest share of revenues from the sales of new or significantly improved products in total revenues was achieved by entities employing 250 and more workers, both in the group of industrial enterprises (10.3%), and in service enterprises (6.4%).

In 2016, just like in 2015, industrial and service enterprises allocated most funds to the purchase of machines and technical devices, means of transport, tools, instruments, movables and equipment. The outlays constituted 49.4% (in comparison with 51.2% in 2015) of all outlays on innovative activity in industrial enterprises. Service enterprises allocated the majority of funds to research and development activity – 41.0% (in comparison with 32.7% in 2015). The lowest outlays on innovative activity in industrial enterprises were allocated to knowledge from external sources, and in service enterprises, just like in the previous research period, on staff training directly related to the introduction of a product or process innovation.

The main source of financing the expenditure on innovative activity in 2016, just like in 2015, were own funds, which in industrial enterprises constituted 71.6% of all expenditure incurred for this (in comparison with 62.0% in 2015), and in service enterprises – 88.2% (in 2015 – 73.0%).

The highest percentage of innovatively active industrial enterprises which gained public support for innovative activity was in Lesser Poland Voivodship (34.7%), and in the case of service entities - in Podkarpackie Voivodship (59.0%).

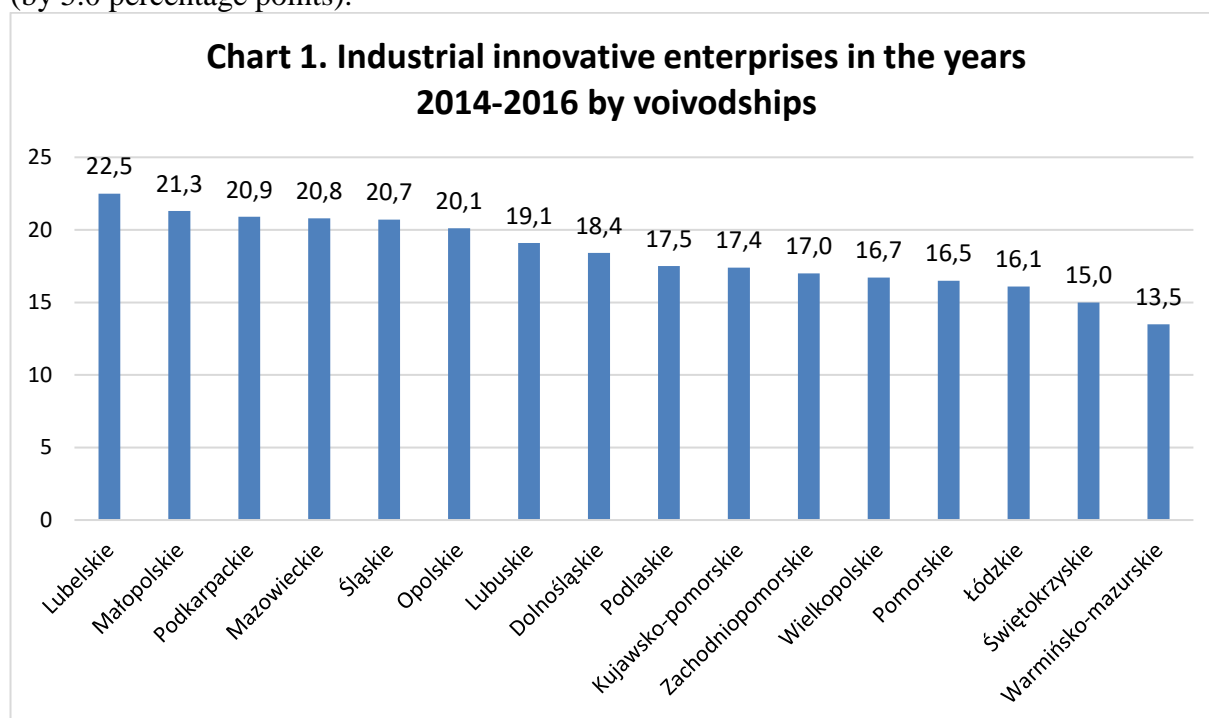
In the total number of entities cooperating in innovative activity, 18.5% of industrial enterprises and 16.5% of service enterprises cooperated within clusters (it was less by 0.7 percentage points and by 4.3 percentage points, respectively, than in the previous years). Considering the territorial cross-section, the biggest percentage of industrial and service enterprises cooperating within a cluster initiative concerning innovative activity took place in Lublin Voivodship (44.3% and 41.2%, respectively).

When analysing innovativeness in the territorial approach, we can observe that among industrial enterprises the highest percentage of entities which in the years 2014-2016 introduced innovations was observed in Lublin Voivodship (22.5%), and the lowest one in Warmian-Masurian Voivodship (13.5%). The highest growth of the share of those enterprises was marked in Lublin Voivodship (by 4.1 percentage points), whereas the biggest decline in Podlaskie Voivodship (by 3.1 percentage points).

Considering the territorial division of the country, the greatest percentage of industrial enterprises which in the years 2014-2016 introduced new organizational methods was observed in Lubusz Voivodship (12.9%), whereas the smallest - in Warmian-Masurian Voivodship (5.5%). Among service enterprises, organizational innovations were introduced most often in Masovian Voivodship (13.2% of enterprises), and least often in Opole Voivodship (1.8%). In the years 2014-2016 the share of industrial enterprises which introduced organizational innovations increased in eleven voivodships (the biggest number in Lubusz Voivodship – by 5.0 percentage points), whereas in service enterprises – in six voivodships (the biggest number in Podkarpackie Voivodship – by 5.0 percentage points).

Considering the territorial diversity, the highest percentage of industrial enterprises which introduced marketing innovations in the years 2014-2016 were observed in Lubusz Voivodship (13.0%), the lowest in Warmian-Masurian Voivodship (5.2%). Among service enterprises, new marketing methods were most often implemented in Masovian Voivodship (12.5% entities), whereas the least activeness within that scope was observed in Opole Voivodship (0.8%). In the majority of voivodships there was an increase in the share of enterprises which introduced marketing innovations. The greatest growth among industrial enterprises was in Lubusz

Voivodship (by 6.3 percentage points), and in service enterprises – in Greater Poland Voivodship (by 5.0 percentage points).



Source: Author's calculation

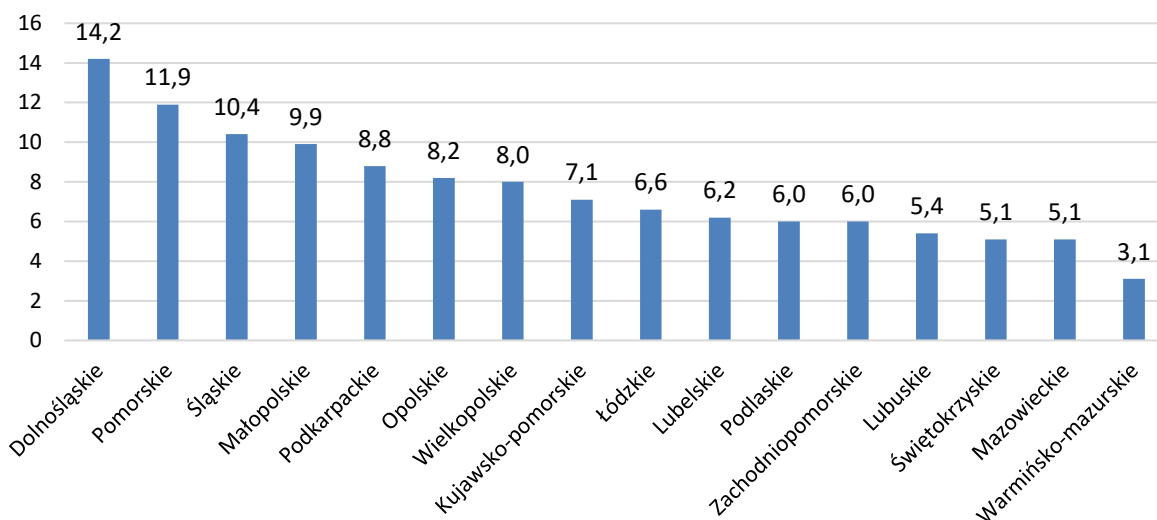
Considering the territorial division of the country, in 2016 in industrial enterprises the highest share of revenues from the sales of new or significantly improved products in the total value of sales revenues was marked in Lower Silesian Voivodship - 14.2% (a year before – in Pomeranian Voivodship – 18.3%). The lowest ratio, just like in the previous year, occurred in Warmian-Masurian Voivodship – 3.1% (a drop by 0.5 percentage points).

In service enterprises the share of revenues from the sales of new or significantly improved products in the total value of sales revenues was in the range from 0.1% in Opole Voivodship to 7.0% in Podkarpackie Voivodship (in the previous year the lowest ratio was also observed in Opole Voivodship – 0.3%, and the highest one in Masovian Voivodship – 5.1%).

In 2016, the expenditure incurred on innovative activity in the group of industrial enterprises⁶ was 28.3 billion zloty, that is, by 9.0% less than in 2015, whereas in the group of service enterprises – 10.7 billion zloty, that is by 15.3% less than a year before. Among industrial and service enterprises, the highest expenditure on innovative activity was incurred by enterprises with the number of workers 250 and more. Their share in expenditure on innovation of industrial enterprises in total was very high (in 2016 it was 80.0%), and annually it increased by 5.0 percentage points. The situation was similar in service enterprises, where the share of the mentioned group of enterprises in the outlays on innovations in total in 2016 was 74.4%, but it was lower than in the previous year by 3.9 percentage points.

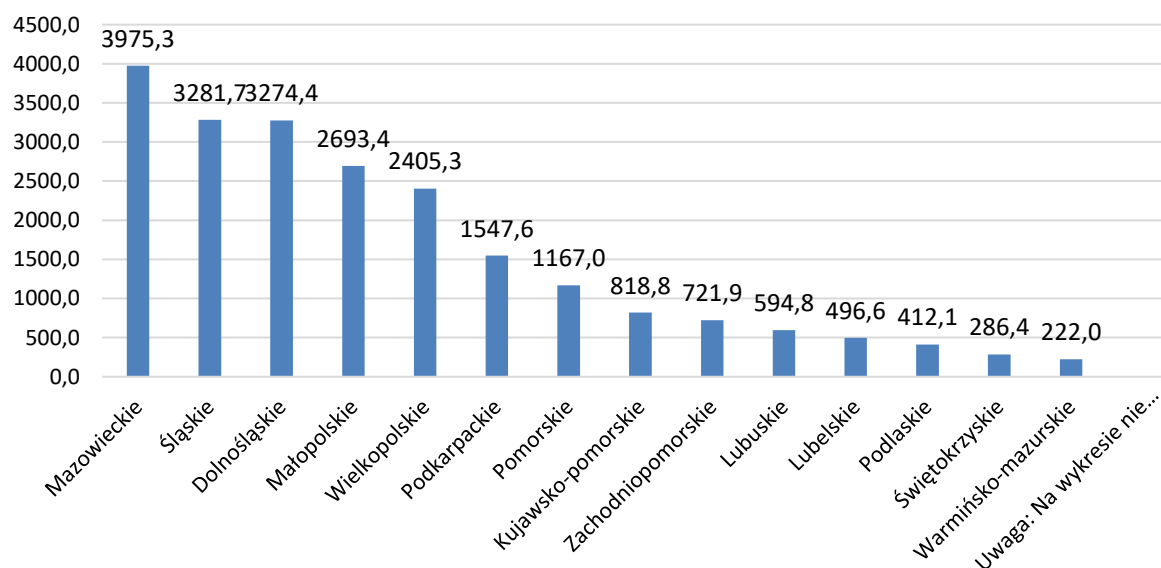
⁶ The outlays consider current and investment expenditure on product and process innovation which were incurred in the reporting year on successful works (i.e. ended in the implementation of the innovation), unfinished (continued) and stopped or withdrawn before the completion, regardless of the sources of their financing.

Chart 2. Revenues of industrial enterprises from sales of new or significantly improved products as the share of total revenues from sales in 2016 by voivodships

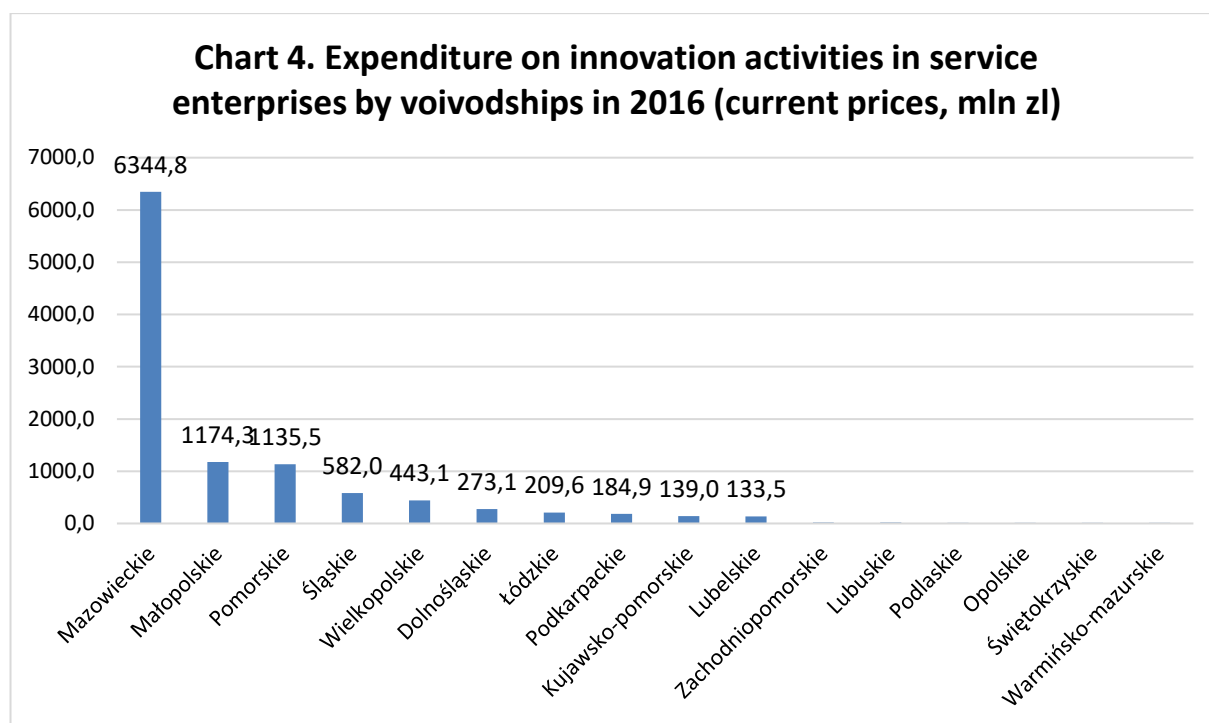


Source: Author's calculation

Chart 3. Expenditure on innovation activities in industrial enterprises in 2016 (current prices, mln zł)



Source: Author's calculation



Source: Author's calculation

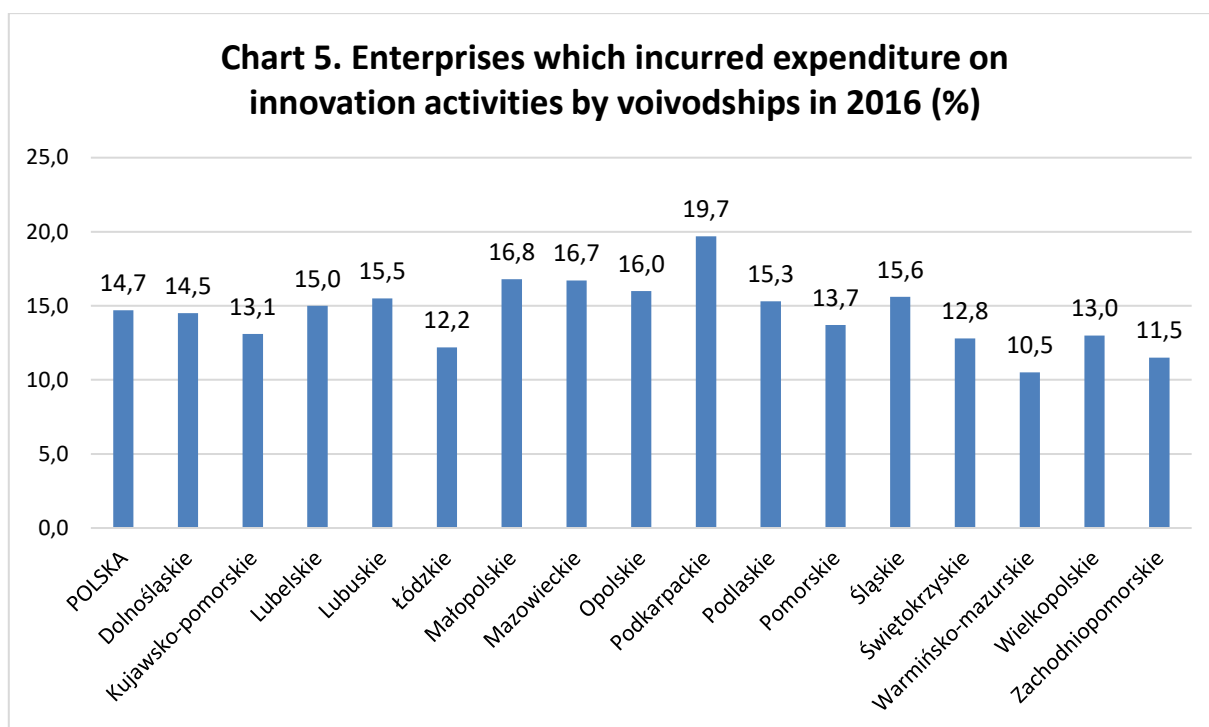
The amount of expenditure on innovative activity varies in the scale of the country. In 2016, the highest outlays on innovation incurred by industrial enterprises were observed in Łódź Voivodship, and by service enterprises - in Masovian Voivodship. The smallest amount of funds was incurred by entities from Warmian-Masurian Voivodship.

In 2016 in the structure of expenditure on innovative activity in industrial enterprises, almost a half was expenditure on the purchase of machines and technical devices (49.4% compared to 51.2% in 2015), and in service enterprises the largest share was made up by funds allocated to research and development activity (41.0% compared to 32.7% in 2015).⁷

Own funds of enterprises are the major source of financing outlays on innovative activity. In 2016 it constituted 71.6% of all expenditure incurred on it in industrial enterprises (by 9.6 percentage points more than a year before) and 88.2% – in service enterprises (by 15.2 percentage points more).

In 2016 expenditure on innovative activity was incurred by 14.7% of industrial enterprises and 11.2% of service enterprises (compared to 14.0% and 7.4%, respectively in 2015). The highest percentage of industrial enterprises which incurred such expenditure was observed in Podkarpackie Voivodship (19.7%), where its highest annual increase took place at the same time (by 5.3 percentage points), whereas the lowest was observed in Warmian-Masurian Voivodship (10.5%). Among service enterprises the ratio was highest in Masovian Voivodship (15.9%), and lowest in Warmian-Masurian Voivodship (3.2%); the highest growth in comparison with 2015 took place in Greater Poland Voivodship (by 8.3 percentage points).

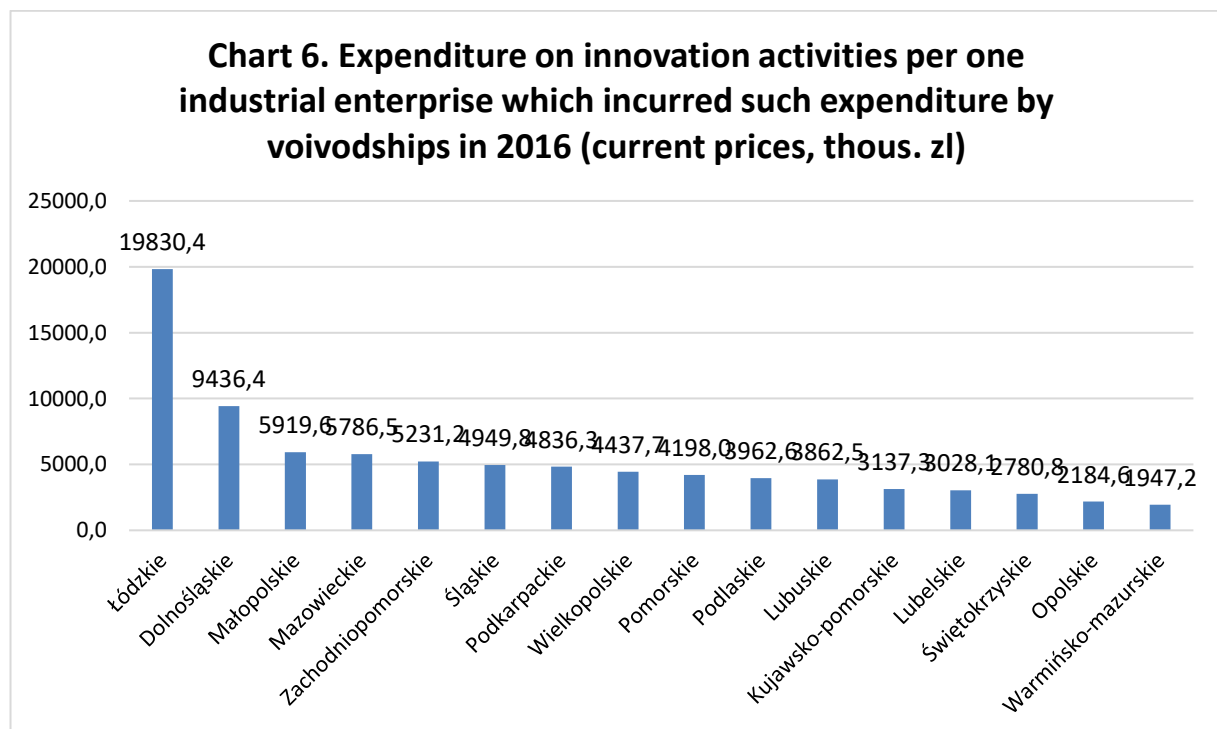
⁷ We can distinguish the following sources of financing expenditure on innovative activity: own funds, funds obtained from the state budget, raised from abroad (non-returnable), coming from the risk capital funds, bank credits.



Source: Author's calculation

In 2016, in comparison with the previous year, the expenditure per one industrial enterprise which incurred funds on innovative activity decreased by 1.0 million zloty to the amount of 5.9 million zloty, and per one service enterprise by 2.8 million zloty to 3.7 million zloty.

The highest expenditure on innovative activity per one industrial enterprise which in 2016 incurred outlays on this type of activity was marked in Łódź Voivodship, and the lowest in Warmian-Masurian Voivodship. In services, the highest value of this ratio was observed in Masovian Voivodship, and the lowest in Opole Voivodship.



Source: Author's calculation

Among enterprises in the industrial processing section classified by the technique level, the highest outlays on innovative activity per one enterprise was observed in entities included in upper-medium technique by 6.6 million zloty and it was more than in high and low technique enterprises by 1.4 million zloty and 2.3 million zloty, respectively, and over two times more than in the case of lower-medium technique. In 2016, in comparison with the previous year, a decline in the volume of expenditure on innovation per one enterprise concerned all levels of technique; the highest was observed in high technique (by almost 30%).

CONCLUSIONS

Under the term of the European Funds there are a few types of financing instruments, but all of them serve the implementation of the European Union regional policy. Most of them are intended for the European Union members, although some were also addressed to countries still applying for the membership. Among the mentioned financing instruments we can distinguish: pre-accession funds (PHARE, SAPARD, ISPA), structural funds (European Social Fund, Regional Development Fund), Cohesion Fund, European Agricultural Guarantee Fund, European Agricultural Fund for the Rural Development, European Fisheries Fund. According to the previous arrangements, structural funds are the most important source of the EU funding for the member states. Their aim is restructuring and modernisation of economies of the EU member states, and they are not addressed to countries but directly to regions, supporting their development and innovativeness based on GDP per capita.

Within the European Funds a number of activities and investment were financed in Poland. Most of them concerned the development of regions and the growth of their innovative potential. Table 1 presents the effects of the use of those funds in the years 2004-2006 and 2007-2013.

Table 1 The effects of the use of the European Funds in Poland in the years 2004-2006 and 2007-2013

2004-2006	
entrepreneurship and business environment	- 18 500 investments in enterprises, - 74 business environment institutions, - 98 micro-loan and guarantee funds, - 63 industrial, scientific and technological parks, as well as business incubators,
Transport	- 5 081 km of roads, - 636 km of rails,
Education	- 200 000 computer workstations in schools, - 693 000 pupils and students who took advantage of EU grants, - 231 supported didactic and research facilities, - 571 new sports facilities,
Health	- 551 supported healthcare centres, - 9 000 items of purchased medical equipment for healthcare centres,
environmental protection	- 10 787 km of sewerage system, - 5 014 km of water pipe system, - 169 sewage treatment plants,
culture	- 122 renovated historic objects, - 296 new or modernised facilities of cultural and recreational infrastructure.

2007-2013	
labour and entrepreneurship	- 40 972 new jobs, - 30 703 supported enterprises, - 247 supported business environment institutions,
research and development, innovations	- 1 412 supported universities and scientific units, - 653 research centres, - 1 949 laboratories, - 2 921 supported innovative ideas, - 3 685 implemented technologies,
information society	- 5 6752 km of broadband Internet network, - 23 4650 households which got the Internet access, - 5 647 new e-services,
Transport	- 12 005 km of motorways, express roads, national, regional, powiat, local roads, - 1 566 km built/modernised railways, - 2 947 built/modernised public transport rolling stock,
environmental protection	- 522 sewage treatment plants, - 24 646 km of built/modernised sewerage system, - 7 188 km of built/modernised water pipe system, - 710 investment in renewable energy sources, - 1 811 investments related to raising the energy efficiency.

Source: based on Ministry of Development, 2017.

To sum up, we can claim that the scale of acquired EU funds is considerable. However, we should remember that the money thus gained will not translate automatically into the development of Polish regions and the growth of their innovativeness. What is necessary are conditions which will enable the activity of competitors and pro-effective activities. There was time to build the basic infrastructure, improve the inhabitants' standard of living, but the time has come to concentrate effort on competitiveness, effectiveness, and innovativeness. Those aims are possible to be supported with the use of the EU funds. However, the decisions about the scale of their absorption and allocation are made by autonomous authorities of individual regions. Therefore, the positive influence of the European Funds should be always supported by regional authorities and state structures responsible for their use.

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THE LABOR THEORY OF VALUE STRIKES BACK: APPLICATION OF ULC + THE METHOD FOR MEASURING THE LEVEL OF NATIONAL COMPETITIVENESS

Marko Đogo¹

Abstract: *The ULC² + method for measuring the level of national competitiveness has been applied in this paper to a group of 41 European countries. This is the method which had been developed in one of our previous papers (The Labor Theory of Value Strikes Back: ULC + The Method for the Measuring Level of National Competitiveness) and which is based on measuring the Indicator of Current National Productivity (ICNP). The method itself is an attempt to bring together advantages of the output method for measuring the level of national competitiveness and the idea that competitiveness and productivity in the use of limited resources can be equalized, even at the national level. Before the ULC + method application itself, we have looked back on three stages/generations of the method of measuring the level of national competitiveness from 1970s up till now. It has been demonstrated that none of these stages are accidental or entirely limited to the field of economics. Actually, development of the methods for measuring the level of national competitiveness has always been under certain influence of the needs of the societies in which they originated. In that way the first generation was some kind of 'weapon' which developed countries used to undermine governments of the communist countries. The second generation represented the need of the USA to save its leading position on the global ranking list of competitiveness under the increasing deficit (trade and budget deficit) conditions. The third generation met the needs of EU in the way in which methods of measuring macroeconomic competitiveness took the advantages of these (European) countries' development methods (strong social and environmental protection) into consideration.*

The main idea of the ULC+ method is expressing all the inputs needed for creating GDP in a sole measurement unit – working hours. It enabled us to compare the value of output (GDP) and input (expressed in working hours) in each of the referring countries in a uniform and simple way. In this way, from the used measurement units (monetary value per working hour) point of view, ICNP is equal to the ULC method, with the indicator sense being somewhat different because of the capital cost entering the equation.

The ULC + method application itself gave us interesting, but somewhat expected results. According to ICNP, the 10 most competitive European countries are: Luxembourg, Norway, Switzerland, Denmark, Ireland, Iceland, the Netherlands, Finland, Austria and Sweden, while the 10 least competitive economies include: Ukraine, Moldavia, Albania, Belarus, Turkey, Republic of Macedonia, Serbia, Bulgaria, Bosnia and Herzegovina and Russia. Ratio between the most competitive (most productive) and the least competitive countries amounts to 31.3, i.e. by using labour and capital in Luxembourg one gets 31.3 times more output per 1 unit of input than one would get in Ukraine!

Nevertheless, just as any other method has its limitations when applied, so does the ULC + one. Therefore, when it is being applied one should bear in mind that it is an indicator of the current productivity which does not tell us enough about the perspectives of competitiveness in the long run.

Keywords: *national competitiveness, national productivity, short and long term, ULC + method*

JEL Classification: *E 20, F 40*

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² According to OECD, ULC - Unit Labor Cost could be defined as: "the average cost of labour per unit of output produced. They can be expressed as the ratio of total labour compensation per hour worked to output per hour worked (labour productivity)." Available at: <https://data.oecd.org/lprdy/unit-labour-costs.htm>, date of access: 16.10.2018.

INTRODUCTION

What if there was a method for measuring the level of national competitiveness which would be characterized by simplicity and reliability that are inherent to output methods, and by adequacy under the globalized world conditions that is specific to Global Competitiveness Report (GCR) and to other methods based on the measuring the level of competitiveness? We may be ‘on the trail’ of discovering such a method. In fact, after developing the ULC + method in our previous paper *The Labor Theory of Value Strikes Back: ULC + The Method for Measuring The Level of National Competitiveness* (Đogo, 2018), we want to test it on a group of European countries and to prove its usefulness since we believe this method possesses all the previously mentioned qualities. Nevertheless, before applying the method, we are obliged to remember the theoretical basis/path of its development in order to get a clearer interpretation of the obtained results.

In the previously mentioned paper we have stated our view that methods of measuring the level of national competitiveness have gone through three phases (generations) so far.

The first generation of methods emerged in the late 1970s and it is the so-called output method of measuring national competitiveness. The method was developed by the economists from developed capitalist countries to point out the superiority of the capitalist economies over the economies of the communist countries. Typical indicators used by the output method are trade surplus/deficit, external debt, budget deficit, per capita GDP, etc. In order to understand the spirit of the times, it should be pointed out that during the 1970s and early 1980s National Competitiveness was still a concept overshadowed by the International Competitiveness concept, which, as a rule, was measured by the price competitiveness of certain economic branches (i.e. microeconomically).

The second generation of the method of measuring national competitiveness emerged in the late 1980s and was based on the idea of equalizing competitiveness with productivity, even on the state level. The reason for the emergence of this method was the poor economic performance of some of the developed countries (when measured by the traditional competitiveness indicators). Precisely, along with the economic collapse of the communist countries in the late 1980s, the trade and budget deficit, as well as the external debt of the USA increased. Since the USA stood for the hegemon of the democratic-liberal world at the time, it was necessary to develop a new method to suit the new age. Under the circumstances, new methods developed by World Economic Forum (WEF) came in place of the output method. They were based on the theoretical foundations provided by Michael Porter. Nevertheless, as much as the second generation of the method for measuring macro-competitiveness suited the USA, the same could not be said for most of European countries. In fact, a specific model of the development of the continental Europe countries, known as the European social model, encouraged European institutions and experts to develop the third generation of a method for measuring the level of national competitiveness. Those are the methods that include both social and environmental indicators in the assessment, and are based on the premise that social benefits are not the limiting factor of the economic development but an indicator of the investment in human capital. They are also based on the assumption that high environmental standards do not harm economic growth rates but provide long-term sustainability of socio-economic development. However, each of the above mentioned methods of measuring the level of national competitiveness has its advantages and disadvantages. The first-generation methods’ advantage is the fact they are quiet reliable because of being based on the measurement of economic indicators followed by economic statistics for over a century. The disadvantage is in neglecting productivity in the use of resources at national level, which is why is possible that even very inefficient economies have good economic results (trade surplus, GDP growth, employment, etc.) with the resource dissipation. Strong point of the second-generation method is that it takes into account productivity at the national level. The

drawback of such methods is the reduced reliability which is related to the way they measure indicators. Namely, GCR is based on measuring the ‘pillars’ of competitiveness i.e. indicators that are supposed to be directly related to the resource usage productivity. Nevertheless, the assessment of these indicators is based on the research of the subjective feelings of businessmen from the countries observed, so there is a doubt about the results thus obtained. Third-generation methods generally share advantages and disadvantages of the second-generation methods, although they are even more complex since they also include measuring of non-economic indicators.

In order to get the best of both generations of methods of measuring the level of national competitiveness, we have developed the ULC + method based on the synthesis of Michael Porter’s idea about productivity as a synonym for competitiveness and direct methods of measuring macro-competitiveness through output. The synthesis is solved by putting in the ratio GDP and resources used to create it. To overcome the problem of ‘mixing apples and oranges’, i.e. mixing labour cost and capital, we have used the working hours as a common unit of measure.

The peculiarity of such approach is in its application on the national economy level. There have been similar surveys for decades on the industry level (productivity research on labour and capital usage, individually or collectively).

However, even our newly developed and insufficiently tested method has its disadvantages. The main one stems from the observation period. Namely, this is an attempt to measure *current* productivity, which may be inconsistent with long-term development needs. Our hypothesis is that there is a need for additional methods of measuring the competitiveness in a very short period of time because they can give us an interesting insight into the current problems of low resource utilization productivity in developing countries.

LITERATURE REVIEW

Although the topic of national competitiveness has become relevant quiet recently, there are thousands of papers dealing with this issue. Our superficial research has shown that, in august 2018, it is possible to find 64 working papers referring to this problem just on the IMF³ website. One can find 23 working papers on national and international competitiveness on NBER⁴ website.

Not to lose our track we have singled out about fifteen papers/reports whose content we are familiar with and which, in our opinion, deserve special attention.

An example of paper that measured competitiveness 40 years ago by comparing productivity of labour and capital use in different countries, although at the level of individual industries, is *Protection and Competitiveness in Egyptian Agriculture and Industry* (Hansen, Nashashibi, 1974).

Typical representatives of the papers written during 1980s which incorporate the approach of the first generation of methods for measuring national competitiveness are *US Competitiveness in the World Economy* (Scott and Klodge, 1985) and *Industrial Competitiveness* (Fagerberg, 1988).

Although written later, two of Krugman’s papers, i.e. books *Competitiveness a dangerous obsession* (Krugman, 1994) and *Making sense of the competitiveness debate* (Krugman, 1996) are considered to be the *classics* in this economic field.

³ <https://www.imf.org/en/publications/search?when=After&series=IMF+Working+Papers>

⁴ <http://www.nber.org/>

It is completely impossible to talk about national competitiveness without mentioning Michael Porter and his famous book *The Competitive Advantage of Nations* (Porter, 1998) that was first published in 1990. It was a basis for creating the *Global Competitiveness Report* (WEF, 2017) which is most often mentioned nowadays in the media as the source of data on the levels of national competitiveness. The specificity of macro-competitiveness as a topic is that it very often uses various reports as data sources and subject matter disputes. Probably the second by citation is the report *Global Investment Competitiveness Report* (IBRD, 2017). Highly cited reports *Doing business* (IBRD, 2017) and *Economic Freedom of the World* (Fraser institute, 2017) are also relevant for competitiveness research.

A survey that drew a lot of attention in Europe and that is a valid representative of the third generation of methods for measuring the level of national competitiveness is *Competitiveness under New Perspectives* (Aiginger, Barenthaler-Sieber and Vogel, 2013). The authors did it on behalf of WIFO by the order of the European Commission.

One of the latest surveys that caught the expert community's attention is *The Determinants of National Competitiveness* (Delgado et al. 2012) whose author is Michael Porter among the others.

The paper in Serbian which summarized the history of the macro-competitiveness concept development from 1970s up till now in the most wholesome way is *Cause of decline and low level of Serbia economy competitiveness* (Kovacevic, 2010).

We would like to point out a bit subjectively one of our papers dealing with this subject which drew a lot of attention of the expert community: *Is the Global Competitiveness Report the right measure of macroeconomic competitiveness* (Đogo, Stanišić, 2016). A recent paper from the region that is particularly interesting is *Contemporary approaches to measuring competitiveness – the case of EU member states* (Šegota, Tomljanović and Huđek, 2017).

METHODOLOGY

As it was previously mentioned, we developed the basic methodology (i.e. formula for measuring the indicators which we unimaginatively named Indicator of Current National Productivity – ICNP) in the paper *The Labor Theory of Value Strikes Back: ULC + The Method for Measuring The Level of National Competitiveness*. This paper deals with the application of that methodology. The formula used to calculate the Indicator is:

$$\text{Indicator of Current National Productivity} = (\text{GDP in \$}) / (\text{average number of workers during a year} \times \text{working week duration} \times \text{number of working week per year} + \text{gross investment transformed from money value to number of working hours})$$

The basic idea is to express all the investments necessary for GDP creation in a single unit of measure – i.e. working hours. When that is done, it is possible to put the value of output (GDP) and input (expressed in working hours) into a relation, which equalizes ICNP with ULC according to the unit of measure used (monetary value/1 working hour), although the point of this Indicator is somehow different.

The application of the indicator is done on a group of forty-one (41) European countries. The data relate to 2017 which is in accordance with the indicated (short) period of observation.

It is obvious from the formula itself that the application of the method requires the following data:

- GDP in \$
- average number of workers during a year
- working week duration
- number of working weeks per year

- GCFC
- average hourly wages

The data are collected from the ensuing sources:

- The World Bank database was used for GDP in \$
- The World Bank database was also used to calculate the average number of workers throughout a year across the countries. However, since there is no already calculated indicator that we need, we have used two available indicators (labor force, total and unemployment total of total labor force). By combining them we got the necessary data.
- The International Labour Organization's (ILO) database was used for obtaining the working week duration data.
- The World Bank database was also used for GCFC
- The data from the statistical institutes or ministries of Finance of the observed countries have been used for the average gross income data. We were not able to find the official authorities' data in a few cases so we used information from the specialized portals dealing with economy, which has been stated. By dividing the average gross income with the number of working hours in a country we have collected the data on average hourly wages;
- As the data on the average gross income of European countries found in the statistical reports are expressed either in euros - € or in national currencies, we used the European Central Bank exchange rate as of December 31, 2017 for their conversion into \$⁵.

RESULTS AND DISCUSSION

We calculated the ICNP (given in column 8) by applying the above given formula to the data given in columns 2, 3,4,5,6 and 7 and ranked 41 observed countries in accordance with the obtained results.

Table 1 – Indicator of current national productivity (\$ per 1 working hour)

Country:	BDP, current \$ (in millions)	Labor force, total	Average number of workers during year	Working week duration	Gross Fixed Capital Formation (in millions)	Average hourly wages (in USD)	Indicator of current national productivity (\$ per work. hour)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1. Luxemburg	62,404.46	289.930	273.404	38	10,638.87	36,49	74,83
2. Norway	398,831.96	2.789.920	2.672.743	34	96,014.02	37.69	54,70
3. Switzerland	678,887.34	4.930.840	4.694.159	36	166,336.36	42,01	53,11
4. Denmark	324,871.97	3.042.140	2.865.695	35	66,204.76	40,87	47,39
5. Ireland	333,730.76	2.262.890	2.118.065	36	78,240.34	24,37	46,41
6. Iceland	23,909.29	210.820	204.706	40	5,293.16	35,77	41,55
7. Netherlands	826,200.28	9.096.110	8.650.400	32	167,744.46	24,59	38,84
8. Finland	251,884.89	2.684.550	2.450.994	36	56,911.37	25,88	37,01
9. Austria	416,595.67	4.565.910	4.314.784	35	97,944.99	28,60	36,84
10. Sweden	538,040.46	5.316.840	4.955.294	36	134,095.29	24,45	36,36
11. Germany	3,677,439.13	43.473.200	41.864.691	35	747,199.60	29,70	36,18
12. Belgium	492,681.28	5.011.370	4.640.528	37	114,682.78	24,30	36,01
13. France	2,582,501.31	30.356.750	27.412.145	36	581,386.63	22,64	33,45

⁵ Since the World Bank data are expressed in \$, we had to make this conversion.

14. Italy	1,934,797.94	25.458.960	22.582.097	37	338,749.91	19,07	31,52
15. United Kingdom	2,622,433.96	33.870.290	32.413.867	36	442,210.88	19,13	31,21
16. Spain	1,311,320.02	22.966.950	18.970.700	37	269,525.24	16,31	24,66
17. Slovenia	48,769.66	988.730	920.507	38	9,008.52	12,11	18,98
18. Malta	12,537.75	216.820	207.496	38	2,945.49	10,00	17,75
19. Greece	200,288.28	4.880.180	3.835.821	41	25,329.87	7,12	17,02
20. Portugal	217,571.08	5.173.730	4.708.094	38	35,178.92	8,37	16,07
21. Cyprus	21,651.79	615.940	549.418	38	4,571.78	12,90	14,99
22. Estonia	25,921.08	690.360	643.415	39	6,153.25	9,33	13,16
23. Czech Republic	215,725.53	5.371.440	5.204.925	39	54,417.69	8,73	12,82
24. Slovak Republic	95,769.03	2.752.820	2.535.347	39	20,304.50	8.04	12,46
25. Croatia	54,849.18	1.805.710	1.610.693	39	10,898.06	8,25	11,92
26. Lithuania	47,168.30	1.458.340	1.354.797	38	8,880.34	6,71	11,76
27. Latvia	30,264.45	995.280	904.709	39	6,030.14	7,17	11,28
28. Poland	524,509.57	18.303.570	17.388.391	40	94,507.71	7,70	10,80
29. Hungary	139,135.03	4.656.600	4.456.366	39	29,940.81	7,44	10,62
30. Romania	211,803.28	8.833.530	8.374.186	39	47,783.07	6,92	8,84
31. Montenegro	4,774.09	246.870	207.370	42	1,202.36	5,04	6,89
32. Russian Federation	1,577,524.15	75.638.700	71.705.487	39	342,229.03	3,82	6,70
33. Bosnia and Herzegovina	18,168.58	1.403.240	1.044.010	41	3,043.36	4,64	6,28
34. Bulgaria	56,831.52	3.243.190	3.038.869	40	10,917.31	3,96	6,24
35. Serbia	41,431.65	3.138.980	2.696.383	41	7,646.81	3,96	5,38
36. Macedonia, FYR	11,337.83	953.820	753.395	42	2,636.91	3,77	4,82
37. Turkey	851,102.41	31.275.220	27.741.120	46	253,705.82	2,23	4,72
38. Belarus	54,442.37	5.066.860	5.041.525	35	13,616.67	3,17	4,03
39. Albania	13,039.35	1.330.860	1.145.870	40	3,289.05	3,17	3,83
40. Moldova	8,128.49	1.269.660	1.212.525	38	1,776.58	2,23	2,54
41. Ukraine	112,154.19	20.535.440	18.584.573	39	17,948.76	1,97	2,39

Source: <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?view=chart>,

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<http://www.insse.ro/cms/ro/tags/comunicat-castig-salarial> , http://www.gks.ru/free_doc/doc_2017/info/oper-11-2017.pdf, <http://publikacije.stat.gov.rs/G2018/pdf/G20181202.pdf>,
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It can be seen in the table no. 1 that according to ICNP, the 10 most competitive European countries are: Luxembourg, Norway, Switzerland, Denmark, Ireland, Iceland, the Netherlands, Finland, Austria and Sweden.

On the other hand, the 10 least competitive European economies include: Ukraine, Moldova, Albania, Belarus, Turkey, Macedonia, Serbia, Bulgaria, Bosnia and Herzegovina and Russia.

Ratio between the most competitive (most productive) and the least competitive countries amounts to 31.3, i.e. by using labour and capital in Luxembourg one gets 31.3 times more output per 1 unit of input than one would get in Ukraine!

Nevertheless, when analysing these results one should bear in mind that it is an indicator of current productivity, which does not tell us enough about the perspectives of competitiveness in the long run. Actually, the usual understanding of the countries which can be expected to grow rapidly: high investment + low wages = high competitiveness is in contrast with the ICNP measuring method.

From the ICNP calculating formula, it can be seen precisely that the higher average hourly wages cause the lower capital costs expressed in the working hours. Also, relatively higher consumption and lower GFCF are interpreted as indicators of higher current productivity (competitiveness) which is not acceptable in the long run.

It is necessary to mention the influence of the working week duration too. Namely, our equation shows that a shorter working week produces more favourable results (higher output per unit of input).

Perhaps the most interesting example is the country whose current competitiveness is not high, but in case it preserves political stability, it can expect high growth rates in the future. According to the data from the table no. 1 that country is Turkey. Precisely, it is a country whose GFCF (as GDP %) amounts to 31%, which in combination with extremely low hourly wage (\$ 2.23 per working hour) and long working week (46 hours) puts this country on the infamous 37th place on the current competitiveness (productivity) scale.

Considering all that has been stated, it is clear that the ULC + method does not compete with GCR to be better universal macro-competitiveness indicator. It is a helpful method for measuring current competitiveness. In our opinion, the obtained results are quite interesting and confirm the hypothesis that there is a need for additional methods for measuring national competitiveness, especially those methods dealing with short periods because they give us an interesting insight into the current issues of low resource utilization productivity in the countries of south-eastern and eastern Europe.

CONCLUSIONS AND RECOMMENDATIONS

It seems that the results of this survey show that it is hard to find a perfect methods of measuring macro-competence – a method that would be equally simple, reliable and applicable in both long and short term.

The ULC + method we developed in the previous paper and applied in this one offers an interesting insight into the some countries' effectiveness in using labour and the capital at their disposal. Quite expectedly, the results show that the productivity of the production factor utilization is the highest in the northern Europe countries, including two countries of central Europe (Switzerland and Austria), while the lowest productivity is in the countries of south-northern and northern Europe (especially in the Balkans countries).

However, low current productivity, although unquestionable, can be interpreted as an opportunity for accelerated growth, especially in the countries with high investment rates.

It is interesting to observe in which direction the idea of direct measuring of productivity at the national level can be further developed.

First of all, the ULC + method can be upgraded to the ULC ++, by adding a 'country' factor in the formula for measuring ICNP besides labour and capital. At the moment we were not able to find the data on the country's average value and the rate of 'amortization' in the observed group of countries (41 European countries), but an interdisciplinary research could overcome this obstacle.

It would also be interesting to compare the result of macro-competitiveness measurement by the ULC + method with the results from the famous Global Competitiveness Report-a (GCR) and the 6 Basic Competitiveness Indicators (6BIC) method.

In that way, the data on the current and long-term expected productivity (ULC + vs GCR) would 'intersect'.

The assessments of the current competitiveness obtained by applying two different approaches would 'intersect' too. One approach starts from the equalization of competitiveness with productivity (ULC +) and the other one that proceeds from equalizing competitiveness with reaching a satisfactory level of sustainable development (6BIC). This will be the subject matter of some of our future papers.

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CLUSTER ANALYSIS OF THE BANKING SECTOR: THE CASE OF SERBIA

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Abstract: *The contemporary trends reflected in the development of market relations in the financial sphere, as well as the increasingly intensive use of modern information and communication technologies, have led to an increased need for monitoring and analyzing the operations of banks. Bearing in mind that one of the main components of stable and continuous economic growth is a stable and developed financial system, wherein special attention is paid to the banking system as the most important and the biggest part of the financial system, monitoring of the performances of the banking sector becomes of great importance in order to achieve sustainable growth and development. The indicators of profitability, costs and risks of banks are very important indicators of their business success. The fact is that banks represent profit-oriented entities and that maximizing profits is one of the main goals of the bank's management. On the other hand, banks are naturally faced with significant, systemic and non-systemic risks, which management must also take into account. Since the performance of banks represents one of the factors of success and development of the national economy, it is necessary to observe the trend of these indicators over time to determine the state of the overall banking system. Therefore, in this paper, the banking sector of the Republic of Serbia will be analyzed based on the indicators of profitability, costs and risks of banks. The aim of the paper is to divide banks into clusters on the basis of these indicators as key variables for their cluster grouping. Grouping of banks by clusters will be carried out for a period of five years, with a comparative overview of their performance on the basis of aforementioned indicators. Also, grouping of banks according to similar indicator values in cluster will enable monitoring of their possible migration to other clusters or the formation of new ones, based on the results achieved in the business year. This will enable monitoring of both, the performance of one bank within the banking sector by years, as well as the performance of the entire banking sector. Cluster analysis of banks in this way contributes to a better consideration of the positioning of banks in the financial market of the Republic of Serbia and forecasting the further movements in the future..*

Keywords: *Banks, Cluster Analysis, Business Indicators, Profitability*

JEL Classification: *C38, G10, G21*

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INTRODUCTION

Banks represent a financial institution which is in modern economic conditions of great importance. They appear in economy as intermediaries in process of gathering savings and further investment of the obtained funds for productive purposes, prospering the process of the economic growth and development. Problems in financial sector can disturb the entire economy and this can cause problems for non-financial firms to get access to funds and consequently limit their further investment and expansion. In order to obtain higher profits banks select adequate business strategies and tend to differ from one another. They strategically participate in different intermediation activities and choose their balance sheet configuration in accordance with their business objectives (Roengpitya et al. 2014). Additionally, they select business model which will provide comparative advantage and which will offer better growth opportunities. However, recent trends in the banking industry which reflect in liberalization, higher competitiveness and appearance of new banking products have contributed to higher heterogeneity between banking business strategies. Since the monitoring of heterogeneous strategies of a large number of banks is problematic, a more efficient approach has been adopted which consist in identifying comparable banks and creating groups of banks which share similar characteristics (Ferstl and Seres, 2012). This groups reflect particular business models. The adequate business model analysis contributes to an improved understanding of financial and economic performance, risk behaviour and governance at a system level (Ayadi et al. 2016). In addition, it represents good tool for assessing the accumulation of risks and for monitoring banks' behaviours and their influence to systemic risk.

Therefore, the aim of this study is to find similarities in business models for banks which operate in the Republic of Serbia based on the results of cluster analysis. Additionally, one of the objectives is to examine whether banks belong to the same group over time or if they transfer between clusters.

This paper focuses at answering three research questions: (1) How many clusters can be identified in Serbian banking sector? (2) What are the main financial characteristics of each cluster?; (3) Do banks change their groups during observed time period?

LITERATURE REVIEW

Adequate analysis of the company's business operations in modern conditions becomes a necessity, primarily bearing in mind the fierce competition due to the contemporary trends of globalization and liberalization. A clear strategic perspective is necessary in order to accomplish competitive advantage and the selected strategies need to be harmonized with objectives, competencies and competitive rules which are prevailing the market (Dikmen et al. 2009). However, companies in the same industry usually have comparable resources and develop similar strategies. There has been a lot of research in area of strategic groups, where the main purpose is to identify similarities in business models, i.e. to recognize strategic groups which consist of companies with comparable strategies.

The theory of strategic groups forecasts the presence of stable groups of companies that accept similar business strategies (Halaj and Zochowski, 2009). Strategic group analysis represent a type of analysis that is oriented towards different groups of competing firms clustered around a similar competitive approach or strategic position (Fleisher and Bensoussan, 2000). One of the main methods for identification of strategic group structures is cluster analysis. A lot of authors have applied cluster analysis in order to identify adequate business models in different types of industry. One of the area which was particularly interesting is financial sector, mainly banking sector. Koller (2001) has applied non-hierarchical cluster algorithms in order to examine the existence of strategic groups during the years 1995-2000 based on balance sheet data of the

largest 35 Austrian banks. The results of cluster analysis revealed the existence of five clusters. Among them three can be considered as strategic groups and two are loose and unstable clusters, corresponding to banks that did not commit themselves to a specific competitive strategy and are stable over time. Cronqvist and Smed (2016) analysed Swedish credit institutions and Swedish branches of foreign banks in four time periods 2000, 2005, 2010 and 2013 based on the data from balance sheets and income statements. The data set contained 19 variables and the results of cluster analysis have identified six clusters which authors have named: Universal banks, Savings banks, Leasing companies, Non-deposit funded credit institutions, Service-focused credit institutions and other credit institutions, according to the kind of companies in these clusters. Dardac and Boitan (2009) conducted their research for the period 2004-2006 and tried to include a representative sample of Romanian credit institutions into smaller, homogenous clusters, in order to estimate which credit institutions have comparable patterns according to their risk profile and profitability. Their findings show that during the observed period the clusters remained relatively stable in terms of similarity of exposure to risks and profitability. Ayadi and De Groen (2014) used clustering methodologies to analyse banks and monitor their behaviour from 2006 to 2013 in terms of financial and economic performance and risk contribution to the financial system as a whole on a sample of 147 banks that cover more than 80% of assets of the EU banking industry. Six dimensions (loans, trading assets, liabilities to other banks, customer deposits, debt liabilities and derivative exposures) were selected to perform a hierarchical clustering. The authors have identified four business models which they have named investment, wholesale, diversified retail and focused retail models. Roengpitya et al. (2014) have used cluster analysis to investigate 222 international banks and they have identified three business models using eight balance sheet ratios (loans, securities, trading book, interbank lending, customer deposits, wholesale debt, stable funding and interbank borrowing): the retail-funded commercial bank, the whole-funded commercial bank and the capital markets-oriented bank. Vagizova et al. (2014) have conducted clustering analysis of Russian credit institutions to determine business models and the analysis revealed the existence of four business models. Halaj and Zochowski (2009) used cluster analysis to identify strategic groups in the Polish banking sector on the basis of annual data from 1997 and 2005. Their findings reveal relatively stable groups in the Polish banking sector constituted after the year 2000 following the major privatisation and ownership changes connected with transition to the mostly privately-owned banking sector in the late 90s. The authors have identified the following groups of banks, named based on the dominant profile of bank business in particular clusters: universal banks, corporate banks, car finance banks, mortgage banks, retail banks and regional banks that associate cooperative banks. Ferstl and Seres (2012) examined Austrian banks' business models and peer groups in the European banking sector on a sample of 234 European banks, including the top 6 Austrian banks for the period from 2005 to 2011 and they have identified five different business models. Farnè and Vouldis (2017) use cluster analysis on a set of 1039 variables for each of 365 banks which have operated in the fourth quarter of 2014. Four business models (wholesale funded, traditional commercial, complex commercial and securities holding) are identified together with a set of 'outlier' banks that follow unique business models. Additionally, several authors carried out the identification of strategic groups on a sample of countries. Sørensen and Gutiérrez (2006) apply cluster analysis techniques to identify some basic forms and trends in the euro area banking sector in terms of the degree of homogeneity of countries. Their findings show that in the period 1998-2004 the banking sectors in the euro area countries has been rather homogeneous. Regarding clustering, the Western and Central European countries (like Germany, France, Belgium, and to some extent also the Netherlands, Austria and Italy) tend to cluster together, while Spain and Portugal and more recently also Greece usually are in the same distinct cluster. Ireland and Finland form separate clusters, but overall tend to be closer to the Western and Central European cluster. Knotek (2014) has conducted cluster analysis in 2002, 2007 and 2012.

According to the results euro area can be divided into two main clusters: first cluster is dominant and is characterized by better macroeconomic indicators, while second cluster is small and formed only by three countries from south wing of euro area (Greece, Portugal and Spain). Similar situation was in 2007. Configuration of clusters changed in 2012, where second cluster increased number of members by Ireland and Italy. The author concluded that second cluster consists only of countries and their banking sectors which suffered from serious problems after 2008 and mostly had to use external financial help. Additionally, in 2002 banking sectors across EMU were comparatively more homogenous than in 2012. Ercan and Sayaseng (2016) examined the sample of consolidate data from 26 countries in the European Union zone covering the period from 2008 to 2013. The results of their analysis indicate that the countries in the same neighbourhood and with higher economic partnership tend to stay in the same cluster. Molin (2017) investigated European banking business models over time period 2007-2016. The findings revealed the existence of two clusters which represent following business models: universal banking with a retail focus and universal banking with a wholesale focus. Additionally, the level of financially reliable has increased in 2016 compared to 2007. Lucas et al. (2018) investigate heterogeneity between the different business models of systemically significant banks in 65 countries over the period of 2000–2012. Their finding disclose four different business models: specialized models, diversified models, investment models and trader models.

METHODOLOGY

Cluster analysis represents a technique that is used to identify the complex associations among variables. The advantage of cluster analysis is that it doesn't require any distinction among variables. There is no need to identify the dependent and the independent variables. Additionally, all variables have the equal significance because cluster analysis tends to identify patterns among variables and not to predict a certain value (Dardac and Boitan, 2009). Therefore, the essence of clustering procedure is in identifying resemblances in the variable structure. Based on the identified similarities, comparable entities are grouped into clusters which represent homogenous groups.

There are several clustering procedures, however, for this research the hierarchical grouping procedure is of importance. The hierarchical grouping procedure is characterized by the development of the structure of entities in the form of "wood". It starts from the so-called agglomerative approach (approach of accumulation) and uses one of the methods of variance for systematic association of entities into groups (clusters). In this paper we employ Ward's procedure, the statistical classification algorithm proposed by Ward (1963). The essence of this algorithm consists in calculating the average values for all variables for each cluster (cluster centres) and then in calculating square of the Euclidean distance from the centre of the cluster for each entity, and finally summarizing these distances for all entities. Ward's algorithm starts from individual entity and successively builds up clusters by joining entities that are closest to each other, with respect to maximising the similarities of any two entities within each group and maximising the differences across groups (Roengpitya et al. 2014). Therefore, this algorithm is based on minimizing loss of information arising from grouping entities into clusters, which is measured by the total sum of the square of the deviation of each entity from the middle of the cluster to which the entity is assigned. This total sum of squares is known as the error sum of squares (Soldić-Aleksić and Krasava-Chroneos, 2009). The point at which the most significant change in the error sum of squares appears indicates the number of clusters.

In order to identify groups of banks in the Serbian banking sector through the cluster analysis the adequate variables had to be selected. We have adopted the framework proposed by Dardac and Boitan (2009). Therefore, the following indicators have been calculated:

- ROA (Return on Assets) – represents an indicator of bank’s profitability and is calculated as ratio of net profit and total assets.
- ROE (Return on Equity) – represents an indicator of bank’s profitability and is calculated as ratio of net profit and equity.
- NIM (Net Interest Margin) – represents an indicator of bank’s profitability and is calculated as ratio of net interest income and the interest earning assets. The higher value of this indicator shows that the bank is more successfully in managing its’ interest bearing assets.
- CDTL (Customers’ Deposits to Total Liabilities) is a measure of bank’s preferred type of financing. The higher value of this indicator means that bank mostly rely on the deposits compared to alternative forms of financing (for example bonds). It also indicates an increase of the saving process.
- CRTA (Capital and Reserves to Total Assets) shows the extent of a bank’s risk aversion. Higher value of this indicator shows that the bank is not prone to risk. In addition, it means that bank with higher value of this indicator, in the event of financial difficulties, has sufficient amount of capital, so that its operations will not be jeopardised.
- CSTA (Cash Holdings and Securities Holdings to Total Assets) represent an indicator of liquidity risk. Banks with a higher level of this indicator can bear with an unexpected deposit withdrawal.
- LNFHTA (Loans to Non-Financial Institutions and Households to Total Assets) denote the measure of bank’s credit risk exposure. The higher level of this indicator shows that bank is exposed to higher credit risks since loans are less liquid than other financial assets. However, loans are more profitable than other bank’s asset therefore, the higher value of this indicator will lead to higher profitability.
- LDR (Loans to Deposits Ratio) measure financial liquidity and show the extent in which banks can achieve sustainable growth of their credit activity. In other words, it stipulates the level in which credit demands are covered by internal resources. High LDR may indicate that bank is exposed to greater risk during short period due to possible liquidity problems in case of sudden deposit withdrawal. However, higher value of this indicator should produce higher profitability.
- OETA (Operational Expenses to Total Assets) represent a measure of bank’s efficiency in terms of banking activity costs.

With the purpose of avoiding biased results correlation analysis has been conducted and the indicators with high value of Pearson’s coefficient have been identified. According to Roengpitya et al. (2014) indicators which exceed a threshold for the correlation coefficient of 0.6 should be excluded from the dataset. Consequently, the indicators which will be used in cluster analysis are: Net Interest Margin, Loans to Non-Financial Institutions and Households, Customer’s Deposit to Total Liabilities, Cash Holdings and Securities Holdings to Total Assets and Capital and Reserves to Total Assets.

RESULTS AND DISCUSSION

The cluster analysis has been conducted based on the data obtained from the income statements and balance sheets of the 27 Serbian banks in the period from 2013 to 2017 using the SPSS statistical program. Descriptive statistics of the selected variables is presented in the Table 1.

The average values of selected indicators shows that in 2013 banking sector in the Republic of Serbia was most prone to risk in order to achieve greater profitability (the highest value of NIM and LNFHTA and the lowest value of CRTA was recorded in 2013). However, the value of CSTA indicator shows that the level of liquidity risk was relatively low.

Table 1. Descriptive statistics of the analysed variables

Period	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Indicators	Minimum					Maximum				
NIM	.02	.02	.02	.02	.02	.10	.10	.11	.12	.13
LNFTA	.17	.17	.16	.20	.28	.86	.81	.83	.84	.83
CSTA	.08	.06	.11	.08	.08	.39	.32	.31	.28	.43
CRTA	.07	.13	.12	.11	.10	1.07	1.05	1.04	.91	.88
CDTL	.43	.46	.78	.89	.87	.98	.99	.99	.99	1.05
Indicators	Mean					Standard Deviation				
NIM	.0456	.0441	.0437	.0401	.0399	.02079	.01817	.01645	.01806	.01863
LNFTA	.6820	.6061	.5681	.5986	.6309	.15794	.17994	.18451	.16462	.13520
CSTA	.2008	.1801	.1915	.1588	.1534	.08988	.04983	.05904	.04328	.06489
CRTA	.2781	.2893	.2767	.2570	.2609	.19365	.18431	.17502	.15858	.14854
CDTL	.7838	.9128	.9339	.9525	.9642	.15136	.10411	.00489	.03247	.03363

Source: Authors' calculation

The next step of the analysis was dedicated to clustering analysis. Based on the agglomeration schedule (Table 2) for the 2013 we have identified that the most significant change in the error sum of squares occurs in the last seven iterations. This result is common for all other years. Consequently, the optimal number of banking clusters is the observed time period for each year is seven.

Table 2. Agglomeration Schedule (Year 2013)

Stage	Cluster Combined		Coefficients	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	3	22	.001	0	0	14
2	5	19	.003	0	0	13
3	10	18	.005	0	0	16
4	2	15	.008	0	0	7
5	16	20	.011	0	0	15
6	13	26	.015	0	0	11
7	2	17	.020	4	0	13
8	8	24	.026	0	0	17
9	4	7	.033	0	0	15
10	6	25	.041	0	0	12
11	11	13	.049	0	6	18
12	6	12	.059	10	0	19
13	2	5	.072	7	2	14
14	2	3	.089	13	1	20
15	4	16	.108	9	5	21
16	10	14	.127	3	0	22
17	1	8	.149	0	8	21
18	11	23	.173	11	0	22
19	6	21	.209	12	0	23
20	2	27	.272	14	0	23
21	1	4	.351	17	15	24
22	10	11	.433	16	18	24
23	2	6	.577	20	19	25
24	1	10	.890	21	22	25
25	1	2	1.500	24	23	26
26	1	9	2.441	25	0	0

Source: Authors' calculation

The conducted cluster analysis has identified seven groups in the Serbian banking sector which are shown in Table 3. If the strategic groups exist, the allocation of banks to clusters should not differ much in time (Halaj and Zochowski, 2009). According to the obtained results we can conclude that the structure of clusters is changing (only several banks remained in the same cluster during the observed period), therefore, we cannot conclude that there are strategic groups in the Serbian banking sector.

Table 3. The results of the cluster analysis

Banks	2013	Banks	2014	Banks	2015	Banks	2016	Banks	2017
<i>AIK</i>	1	<i>AIK</i>	1	<i>AIK</i>	1	<i>AIK</i>	1	<i>AIK</i>	1
<i>JUBMES</i>	1	<i>Eurobank</i>	1	<i>Eurobank</i>	1	<i>JUBMES</i>	1	<i>OTP</i>	1
<i>Telenor</i>	1	<i>Intesa</i>	1	<i>Intesa</i>	1	<i>Credit Agricole</i>	2	<i>Credit Agricole</i>	2
<i>Credit Agricole</i>	2	<i>JUBMES</i>	1	<i>JUBMES</i>	1	<i>Opportunity</i>	2	<i>Halkbank</i>	2
<i>Erste</i>	2	<i>OTP</i>	1	<i>Raiffeisen</i>	1	<i>Procredit</i>	2	<i>Opportunity</i>	2
<i>Halkbank</i>	2	<i>Raiffeisen</i>	1	<i>Unicredit</i>	1	<i>Erste</i>	3	<i>Procredit</i>	2
<i>Opportunity</i>	2	<i>Unicredit</i>	1	<i>Credit Agricole</i>	2	<i>Halkbank</i>	3	<i>Societe</i>	2
<i>Piraeus</i>	2	<i>Credit Agricole</i>	2	<i>Opportunity</i>	2	<i>Hypo</i>	3	<i>VTB</i>	2
<i>Procredit</i>	2	<i>Halkbank</i>	2	<i>Procredit</i>	2	<i>Marfin</i>	3	<i>Erste</i>	3
<i>Societe</i>	2	<i>Marfin</i>	2	<i>Erste</i>	3	<i>NLB</i>	3	<i>KBM</i>	3
<i>VTB</i>	2	<i>Opportunity</i>	2	<i>Halkbank</i>	3	<i>Piraeus</i>	3	<i>NLB</i>	3
<i>Eurobank</i>	3	<i>Piraeus</i>	2	<i>Marfin</i>	3	<i>Societe</i>	3	<i>Telenor</i>	3
<i>Intesa</i>	3	<i>Procredit</i>	2	<i>OTP</i>	3	<i>Vojvođanska</i>	3	<i>Vojvođanska</i>	3
<i>OTP</i>	3	<i>Sberbank</i>	2	<i>Piraeus</i>	3	<i>VTB</i>	3	<i>Eurobank</i>	4
<i>Raiffeisen</i>	3	<i>Societe</i>	2	<i>Sberbank</i>	3	<i>Eurobank</i>	4	<i>Hypo</i>	4
<i>Hypo</i>	4	<i>VTB</i>	2	<i>Societe</i>	3	<i>OTP</i>	4	<i>JUBMES</i>	4
<i>Marfin</i>	4	<i>Erste</i>	3	<i>Vojvođanska</i>	3	<i>Sberbank</i>	4	<i>Marfin</i>	4
<i>Sberbank</i>	4	<i>Hypo</i>	3	<i>VTB</i>	3	<i>Unicredit</i>	4	<i>Piraeus</i>	4
<i>Unicredit</i>	4	<i>KBM</i>	3	<i>Hypo</i>	4	<i>Intesa</i>	5	<i>Sberbank</i>	4
<i>Jugobanka</i>	5	<i>Komercijalna</i>	3	<i>Jugobanka</i>	5	<i>Komercijalna</i>	5	<i>Unicredit</i>	4
<i>KBM</i>	6	<i>MTS</i>	3	<i>KBM</i>	6	<i>MTS</i>	5	<i>Intesa</i>	5
<i>NLB</i>	6	<i>Vojvođanska</i>	3	<i>Komercijalna</i>	6	<i>Raiffeisen</i>	5	<i>Komercijalna</i>	5
<i>Poštanska</i>	6	<i>Jugobanka</i>	4	<i>MTS</i>	6	<i>Jugobanka</i>	6	<i>MTS</i>	5
<i>Komercijalna</i>	7	<i>NLB</i>	5	<i>NLB</i>	6	<i>KBM</i>	7	<i>Raiffeisen</i>	5
<i>MTS</i>	7	<i>Poštanska</i>	5	<i>Poštanska</i>	6	<i>Poštanska</i>	7	<i>Srpska</i>	5
<i>Srpska</i>	7	<i>Srpska</i>	6	<i>Srpska</i>	7	<i>Srpska</i>	7	<i>Jugobanka</i>	6
<i>Vojvođanska</i>	7	<i>Telenor</i>	7	<i>Telenor</i>	7	<i>Telenor</i>	7	<i>Poštanska</i>	7

Source: Authors' preview

The basic financial characteristics of identified clusters are shown in the Table 4.

Table 4. The average value of indicators by clusters

Cluster	Net Interest Margin					Trends
	2013	2014	2015	2016	2017	
1	0.0676429	0.0414925	0.0416223	0.0404243	0.0359875	
2	0.0480686	0.0509887	0.0390961	0.0417457	0.0370443	
3	0.0548866	0.045545	0.0514428	0.0369882	0.0386543	
4	0.0354224	0.0156975	0.0535213	0.0590614	0.051364	
5	0.0415075	0.0398617	0.0449049	0.0418116	0.0328107	
6	0.0312285	0.0373136	0.0352027	0.0181293	0.0387862	
7	0.0369655	0.034744	0.038173	0.0306603	0.0268056	
Cluster	Loans to non-financial institutions and households to total assets					Trends
	2013	2014	2015	2016	2017	
1	0.6633405	0.6623566	0.6589934	0.6798031	0.7150069	
2	0.8237294	0.5540239	0.4179835	0.6908403	0.6877466	
3	0.7455803	0.6934198	0.5497428	0.5154714	0.5034811	
4	0.7048029	0.1718958	0.8313081	0.6396782	0.6300445	
5	0.1663972	0.5035102	0.6230582	0.6982628	0.6380555	
6	0.4689008	0.6381227	0.4910861	0.3633078	0.6456032	
7	0.6147101	0.7645147	0.6364917	0.5941867	0.7150114	
Cluster	Customer's deposit to total liabilities					Trends
	2013	2014	2015	2016	2017	
1	0.9590634	0.9310825	0.9332385	0.9700958	0.9719664	
2	0.7059678	0.9303546	0.9537341	0.9846304	0.9655125	
3	0.8086926	0.9326485	0.9335056	0.9484772	0.9655108	
4	0.562654	0.8050631	0.9326995	0.9258076	0.9442318	
5	0.8000767	0.7153186	0.9892776	0.9512222	0.9585874	
6	0.8902368	0.9836072	0.9005939	0.9449401	0.9849334	
7	0.9201239	0.9405149	0.9646906	0.958755	0.9733211	
Cluster	Cash holdings and securities holdings to total assets					Trends
	2013	2014	2015	2016	2017	
1	0.1962891	0.1761874	0.1367243	0.1341535	0.1427109	
2	0.1274276	0.1898733	0.2203831	0.1319151	0.1222062	
3	0.1781748	0.152602	0.1996337	0.1713568	0.2066305	
4	0.2239076	0.282323	0.1228512	0.1575164	0.1594131	
5	0.0919961	0.1350594	0.222432	0.1503252	0.1298315	
6	0.3861724	0.2275702	0.2089624	0.2843409	0.1745039	
7	0.2383747	0.2243506	0.25108	0.1412508	0.1502575	
Cluster	Capital and reserves to total assets					Trends
	2013	2014	2015	2016	2017	
1	0.4770676	0.2741859	0.2624736	0.2589375	0.2466627	
2	0.1607224	0.3479141	0.6109515	0.2558891	0.2738332	
3	0.3504274	0.2447443	0.2046167	0.3095336	0.3618946	
4	0.2599321	0.2075568	0.1875983	0.2016139	0.2325867	
5	1.0706279	0.3974898	0.3344452	0.2524693	0.2276037	
6	0.1459991	0.1628963	0.2637885	0.2712426	0.1768905	
7	0.2107208	0.1261491	0.18992	0.1953526	0.1541402	

Source: Authors' calculation

The results indicate that compared to 2013 the average profitability of Cluster 1 has dropped in 2017 (the value of NIM is almost halved)⁴. Additionally, a decrease in risk aversion can be noted (the value of CRTA is also almost halved), wherein the increase of the value of LNFHTA shows increase in credit risk and the decrease of the value of CSTA indicates an increase of liquidity risk. It can be concluded that banks in the Cluster 1 accept higher risk in 2017 compared to 2013, but are also less profitable. Regarding banks in Cluster 2 their profitability has also dropped in 2017 compared to 2013 (the value of NIM dropped by almost a quarter). At the same time, they have decreased tendency to risk (the value of CRTA has increased) which is reflected in lower credit risk (decrease of LNFHTA value can be noted) and roughly the same liquidity risk (a minor reduction of CSTA can be noted). Cluster 3 has also recorded decrease in profitability (the value of NIM was 0.05489 in 2013 and 0.03865 in 2017). In addition, they show slight increase in risk aversion followed by reduction of credit risk and reduction of liquidity risk. Banks in cluster 4 have achieved higher profitability in 2017 than in 2013 (The increase of NIM by 45%). Yet, this banks have slightly decreased their risk aversion which can be seen in significant increase of liquidity risk (the value of CSTA has dropped) but at the same time reduction of credit risk can be noted (LNFHTA has increased). Regarding Cluster 5 its profitability has dropped. However, the decrease of risk aversion is very high (the value of CRTA indicator is more than four times lower). Consequently, banks in this cluster record significant increase of credit risk (value of LNFHTA has increased from 0.166397 in 2013 to 0.638056 in 2017) but also slight reduction of liquidity risk. Banks in Cluster 6 have increased their profitability in the observed time period, with the simultaneous increase in risk aversion. However, they record increase in both, credit and liquidity risk. Cluster 7 has a decrease in profitability and also decrease in risk aversion. The increase of credit and liquidity risk can be also observed in 2017 compared to 2013.

CONCLUSIONS AND RECOMMENDATIONS

Adequate analysis of banks' operations is a necessity in modern conditions. However, the fact is that banks differ from each other in different ways and accordingly, in order to achieve business goals, they apply different strategies. Therefore, the main objective of this paper was to identify groups of banks that use similar business strategies on the basis of selected financial indicators by using cluster analysis.

The final result show that seven business models can be identified in the Serbian banking sector. However, the structure of clusters is changing through years, therefore, there are no strategic groups in the Serbian banking sector.

It is necessary to conduct further analysis of each cluster and to identify susceptible business bank models and business strategies which show low performance in order to prevent financial difficulties and to create adequate financial programs for such banks which will create conditions for reduction of risk exposure, improvement of their market positions, development of financial innovations and enhancement of their profitability.

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⁴ In the Table 4 of average indicators values through clusters, the maximum values of indicators are green colored, while minimum values are red colored for each cluster through years. Also, there is a trend line of average values during the period for each cluster.

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FINANCIAL STABILITY OF THE WESTERN BALKAN COUNTRIES: EVIDENCE OF BOSNIA AND HERZEGOVINA

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Abstract: *The financial system is composed of financial institutions, markets, and market infrastructure. Financial stability/instability is a stage where the system is able or unable to handle shocks and the development of financial imbalances and reduces or avoids distorting the process of financial intermediation in terms of distorting savings towards profitable investments. Thus, financial stability is a situation where the financial system can absorb shock without significant changes and disturbances in the current and future functioning. Therefore, through a multiple regression analysis, non-performing loans to changes in endogenous variables will be tested. In this paper will be used the STATA 13.0 software package. The main goal of this paper is to determine the impact of independent variables (micro variables of banks and macro variables) on the stability of the selected Western Balkan countries. The survey covers the period from 2010 to 2016. Data for this research were collected on a quarterly basis. The following countries will serve as a selected group of countries in the Western Balkans: Serbia, Bosnia and Herzegovina, Croatia and Slovenia. Non-performing loans will be used as a dependent variable, and as independent variables: net interest margin, bank regulatory capital to risk-weighted assets, gross domestic product, and size. According to panel data results, the strongest correlation between non-performing loans as the dependent variable of the Western countries (Serbia, Bosnia and Herzegovina, Croatia and Montenegro) was achieved with the following independent variable: the gross domestic product, the bank concentration, and size. Observed, on the other hand, the weakest link between non-performing loans (NPLs) as a dependent variable was achieved with the following independent variables: the net interest margin and the capital adequacy ratio.*

Keywords: *Financial stability, NPLs, regression analysis, VIF.*

JEL Classification: *G1, G10, G2, G20, G21.*

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INTRODUCTION

According to the definition of the European Central Bank – (ECB) is financial stability is a state of the financial system consisting of financial institutions, markets and financial infrastructure, where the financial system is able to endure shocks and the development of financial imbalances, thereby reducing or avoiding the possibility of violating the process of financial mediation to the extent that can significantly worsen the allocation of savings to profitable investments (Agresti, et al. 2008). Therefore, financial stability is a situation in which a financial system can absorb shock without significant disturbances in its current and future functioning and which has no negative impact on the economy. The country's credit rating is the rating provided by the rating agency with the country's ability to meet their current and long-term obligations. Special attention to the country's rating is devoted to stress scenarios in order to analyze the economy resistance to external instability and crisis (Krstić&Šoškić, 2015).

The Central banks of the Western Balkan countries conduct quarterly top-down stress tests in the country, which are one of the main tools for assessing the resilience to possible shocks from the macroeconomic environment and the banking sector. The basic goal of the testing is to assess the ability of the overall banking sector as well as individual banks to submit potential losses that would be realized in the case of actual realization of the assumed shocks. The financial market of Western Balkan countries is bank-centered, which means that bank loans are the primary source of financing companies. In the structure of the financial system of Western Balkan countries, the banking sector is represented by 87.35%.

Basically, testing is carried out through two scenarios: basic and extreme scenario. The baseline scenario sets assumptions based on macroeconomic projections and projections of trends in the banking sector for the next two years. On the other hand, the extreme scenario analyses the low likelihood of creating bad events that would endanger financial stability. In the countries of the Western Balkans, stress testing is based on two presumed shocks: a) slowing down economic activity in the country, and b) increasing interest rates and credit risk. As the credit risk represents the biggest threat to the banking system of the Western Balkan countries, the main objective of this study is to investigate the sensitivity and dependence of non-performing loans as a result of deterioration of the loan portfolio to independent factors that partially affect the increase or decrease in the quality of the loan portfolio (The Central Bank of Bosnia and Herzegovina, 2017). Therefore, we investigate how the level of toxic loans affects the stability of banks in the countries of the Western Balkans. The stability of the banking sector is of great significance for the countries of the Western Balkans, especially due to the majority dominance of foreign banks in the total assets of banks. This study consists of five parts and a conclusion. The first part refers to the introductory considerations and defining the aim of the research as well as the terminology of financial stability/instability. The second part is a broad literature review concerning the link between the non-performing loans and stability. The third part refers to research hypotheses which will be tested in the research part of the paper. The fifth part refers to the data set used the methodology and the obtained results.

A BRIEF OVERVIEW OF LITERATURE

According to the definition of the IMF (2003) and Segoviano et al. (2009), the instability of the banking system can arise either through idiosyncratic components that are associated with bad banking practices that affect the solvency of individual banks from systemic components initiated by expensive shocks that bring financial instability into the banking system.

According to Boyd and De Nicolo (2005), a higher market power in credit markets has contributed to an increase in bank risks as higher interest rates due to higher interest rates are heavily charged. This affects major problems with moral hazard, where at the same time higher

interest rates attract more risky debtors due to the impossibility of borrowing from other institutions and the problem of negative selection.

According to De Nicolo and Loukoianova (2006), there is a reverse link between market concentration and financial stability, which indicates that the risk of bank rupture increases in concentrated markets. They assess the financial stability based on the Z-index - the inverse relationship of banking risks and market concentration through the Herfindahl-Hirschman index (HHI).

According to Lorenzoni (2008), loans and investment booms are associated with high property prices that may be ineffective as market participants do not have a direct impact on market equilibrium. In his research, he came to the conclusion that a higher level of lending, investment, and assets could trigger a stronger decrease in net worth and affect financial stability in case of shock.

In literature, there are usually two main hypotheses about the relationship between competition and the stability of banks, which at first seem contradictory. They relate to competition - cruise and competition - stability. The hypothesis of fragile competition claims that smaller banks in more competitive environments are prepared to take greater risks, and therefore more competitive systems are more fragile than less competitive systems. Observed, on the other hand, the hypothesis of competitive stability is the view that the monopoly position of banks (higher interest rates) in less competitive environments can encourage companies to take on higher risks, which in turn leads to higher probability of occurrence of non-performing loans. Therefore, more competitive and less concentrated banking systems are considered more stable (Vives, X., 2016).

Hypothesis

- I) The null hypothesis is the reason why the independent variables do not significantly affect the dependent.
- II) The alternative hypothesis is the reason why the independent variables do significantly affect the dependent.

In addition to the above-mentioned hypothesis to be tested through the empirical and theoretical F test, the influence of each independent variable also will be tested according to the following:

- a) There is a negative relationship between non-performing loans and net interest margin.
- b) There is a negative relationship between non-performing loans and bank regulatory capital to risk-weighted assets.
- c) There is a positive relationship between non-performing loans and size.
- d) There is a positive relationship between non-performing loans and gross domestic product.
- e) There is a positive relationship between non-performing loans and bank concentration.

STABILITY/INSTABILITY INDICATORS OF THE WESTERN BALKANS BANKS

Financial stability can be seen from two points of view, both the macro side and micro structure. From the micro point of view, financial stability refers to the market structure. For example, a high level of concentration where the dominant banking system of financial mediation can affect the transmission of the infection from one bank to another, and to the entire financial system. Financial stability at the macro level refers to macroeconomic stability, where failures in supervision can lead to possible financial instability.

In this paper, we have chosen to investigate and analyse indicators such as: non-performing loans, bank concentration, CAR (micro indicators of bank operations), as well as indicators that monitor the economic activity of the country (GDP), given that the financial systems of the countries of the Western Balkans are mostly bank-centric.

Table 1. Certain banking indicators for observed countries (in %)

Country	Indicators	2010	2011	2012	2013	2014	2015	2016
Bosnia and Herzegovina	Non-performing loans - NPLs	11.42	11.80	13.47	15.12	14.17	13.71	11.78
	Capital adequacy ratio -CAR	16.17	17.07	17.05	17.84	16.26	14.86	15.82
Serbia	Non-performing loans - NPLs	16.90	19.0	18.60	21.40	21.50	21.60	17.0
	Capital adequacy ratio -CAR	19.90	19.10	19.90	20.94	19.96	20.90	21.83
Croatia	Non-performing loans - NPLs	11.09	12.27	13.76	15.43	16.71	16.33	13.61
	Capital adequacy ratio -CAR	18.79	20.47	20.89	20.87	21.80	20.98	22.53
Slovenia	Non-performing loans - NPLs	8.21	11.81	15.18	13.31	11.73	9.96	5.07
	Capital adequacy ratio -CAR	11.32	11.85	11.40	13.67	18.04	18.77	19.16

Source:<http://databank.worldbank.org>

The previous table illustrates the analysis of trends in non-performing loans and capital adequacy ratio of the banks of the Western Balkans countries for the period from 2010 to 2016. As can be seen, the trend in the reduction of NPLs in 2016 compared to 2015 and 2010 is not seen as a sign of a real reduction, refers to the write-off of uncollectible receivables and loan restructuring. The capital adequacy ratio for all countries was mainly characterized by a rising linear trend (especially Slovenia) where the capital adequacy ratio recorded a rising trend from year to year. With commercial banks in Bosnia and Herzegovina, The highest value of capital adequacy ratio was recorded in 2013 of almost 18%. The lowest value of the capital adequacy ratio was recorded in 2014 about 14%. The average value of the capital adequacy ratio was around 16.43%, which is significantly higher than the statutory minimum of 12%. The average value of the capital adequacy ratio in Serbia was around 20.36, in Croatia from around 20.90 and in Slovenia around 14.88, which is well above the legal minimum of 8%. The capital represents a significant pillar of risky operations of banks, especially credit risk. Given that credit risk is the greatest threat to the stability of banks, especially if the loss was realized due to non-performance of liabilities.

Table 2. Certain macroeconomic and banking indicator for observed countries for the period: 2010 - 2016

Country	Indicators	2010	2011	2012	2013	2014	2015	2016
Bosnia and Herzegovina	GDP growth (annual %)	0.87	0.96	-0.82	2.35	1.15	3.07	3.06
	Z-Score	13.71	17.34	18.21	17.23	18.10	18.06	17.82
	Bank concentration	49.14	47.57	44.65	43.75	43.91	44.62	38.97
Serbia	GDP growth (annual%)	0.58	1.40	-1.02	2.57	-1.83	0.76	2.80
	Z-Score	15.01	8.82	4.01	4.01	-	-	-
	Bank concentration	35.53	37.94	39.80	42.73	45.21	56.16	50.27
Croatia	GDP growth (annual%)	-1.70	-0.28	-2.19	-1.06	-0.49	2.25	2.98
	Z-Score	5.11	5.04	5.19	4.88	5.02	4.38	5.30
Slovenia	GDP growth (annual%)	1.2	0.6	-2.7	-1.1	3.0	2.3	-
	Z-Score	2.27	2.02	1.80	-0.24	3.35	3.79	4.06
	Bank concentration	53.81	53.26	51.49	51.43	52.50	56.28	59.70

Source:<http://databank.worldbank.org/>

The stabilization of the annual growth rate of the gross domestic product followed after the post-crisis period from 2010 to 2011, where the negative trend again resulted from the weakening domestic and foreign demand and the absence of foreign direct investments. The trend of

unstable economic activity lasted from 2012 until the end of 2014, when the stabilization of economic activity followed, accompanied by gradual growth in gross domestic product. Z-Score is an indicator of instability in banks. ZScore assesses the received financial results of banking operations, starting from the assumption that the realized losses of banks that are not covered by capital lead to the bankruptcy of banks (Bessis, 2002). The highest value of ZScore was recorded for banks in B&H, but again at a very low level, which is the result of the dominant presence of foreign banks and stable operations.

DATA AND METHODOLOGY

Data

In this paper, the non-performing loans (NPL) in the countries of the Western Balkans will be used as dependent variables, while the independent variables will use the following: the net interest margin (NIM), bank regulatory capital to risk-weighted assets (CAR), the private credit by deposit money banks and other financial institution to GDP (SIZE) the gross domestic product (GDP) and the bank concentration (BC). The research period covers the period from the period: 2006 – 2017. The analysis will be made using annual data due to the lack of a long-term time series of data for all variables. The equation which is the adjusted regression model in this paper can be expressed as follows:

$$NPL = \beta_0 + \beta_1 NIM_t + \beta_2 CAR_t + \beta_3 SIZE_t + \beta_4 GDP_t + \beta_5 BC_t + U_t \quad (1)$$

The representation of the model will examine calculation of the coefficient of correlation (r), the coefficient of determination R² and adjusted coefficient of determination R². There is also an analysis of variance (ANOVA), which will test the significance of observed variables in the model, where the null hypothesis is the reason why the independent variables do not significantly affect the dependent.

Table 3. A description of the dependent and independent variables in the model

VARIABLE	MEASURED BY	EXPECTED EFFECT
Non-performing loans	The ratio of non-performing loans (payment of interest and principal past due date by 90 days or more) to total gross loans	-
Net interest margin (NIM)	net interest income / invested assets	Negative
Bank regulatory capital to risk –weighted assets (CAR)	Bank regulatory capital to risk – weighted assets	Negative
Private credit by deposit money banks and other financial institution to GDP (SIZE)	Private credit by deposit money banks and other financial institution to GDP	Positive
Gross domestic product (GDP)	Real gross domestic product growth rate (%)	Positive
Bank concentration (BC)	Bank concentration is defined as the ratio of the assets of the three largest commercial banks to total commercial banking assets in a country	Positive

Source: Author's calculation

Non-performing loans (NPLs). Non-performing loans (NPLs) - represents the sum of borrowed money by banks to debtors, where debtors have not made the payment of interest and principal at least at 90 days for commercial bank loans and 180 for consumer loans.

Net interest margin (NIM). Net interest margin is obtained in percentage terms when interest expense is deducted from interest expense increased for loan loss allocations and dividends received by interest-bearing assets. In conditions of increased banking competition, there is a gradual narrowing of interest margins as well as in changing macroeconomic and external circumstances. Under these conditions, there are stronger fluctuations in market interest rates that can lead to higher oscillations in bank wages

Bank regulatory capital to risk-weighted assets (CAR). One of the important factors of the strength of each bank is the capital adequacy ratio. It is derived from the relationships between banking capital and risk-weighted assets. Banking regulation in a number of countries defines capital adequacy in order to protect depositors, i.e., to create confidence in the banking sector. The International Monetary Fund points out several important reasons for measuring capital adequacy, such as: the desire to put its own fund at risk, the quick provision of free cash for transactions and liquidity costs, capital, securing for normal expansion and business financing, part of the capital that requires the application of universal standards as well as the stimulation of less risky lending.

Private credit by deposit money banks and other financial institution to GDP (SIZE). Is an indicator of the liquidity and size of the bank in terms of approved loans in relation to deposits?

Real gross domestic product (GDP). The gross domestic product is a very important indicator of economic activity and overall financial stability. The constant growth of gross domestic product is a positive signal for attracting foreign investors and the survival of foreign banks and the growth of the bank's asset.

Bank concentration (BC). Bank concentration is defined as the ratio of the assets of the three largest commercial banks to total commercial banking assets in a country. Low concentration has an impact on greater competition as it further creates the possibility to maintain financial stability. Competition can encourage banks to take greater risks to maintain profitability. Certainly, the excessive level of competition in the financial market may have an impact on the deepening of the financial crisis.

Results

In order to carry out a quantitative estimation of the relationship between non-performing loans and stability in Western Balkan countries we provide wider regression analysis. Before hypothesis are tested, basic statistic indicators; correlations and VIF values are given Table 4, 5, 6 and 7.

Table 4. Descriptive statistics of dependent and independent variables of the countries of the Western Balkans for the period: 2010 – 2016

Variables	Obs	Mean	Std. Dev.	Min	Max
NPL	28	14.554	4.167	5.071	21.58
NIM	28	3.718	1.176	1.851	5.667
CAR	28	26.303	16.332	11.320	55.805
GDP	28	3.98e+10	1.45e+10	1.60e+10	6.10e+10
SIZE	28	58.798	12.782	42.939	84.508
BC	28	41.153	16.316	15.284	67.681

Source: Author's calculation

The total number of observations in this survey is 28. The previous table shows that the gross domestic product recorded the high volatility, then the capital adequacy ratio (16.332%), the bank concentration (16.316%) and the size (12.782%). Also, the mean value of the selected variables in the model had the same relative trend as standard deviation. The gross domestic product represents an indicator of the stability of the economic activity of each country. The gross domestic product as an indicator of economic stability in all observed countries of the Western Balkans had an unstable and volatile trend. For example, the annual growth rate of gross domestic product in 2008 was over 5%, in 2009 it had a negative value of almost 3%, in order to reach a value of over 3% of 2016. A similar trend in the movement of gross domestic product was recorded in both Serbia and Croatia.

Table 5. Correlation matrix between dependent and independent variables in the model of the countries of the Western Balkans for the period: 2010 – 2016

Variables	NPL	NIM	CAR	GDP	SIZE	BC
NPL	1.000					
NIM	-0.036	1.000				
CAR	-0.407	0.457	1.000			
GDP	0.034	0.273	0.257	1.000		
SIZE	0.314	0.441	0.672	0.728	1.000	
BC	0.158	-0.577	-0.215	-0.241	-0.431	1.000

Source: Author's calculation

From the previous correlation matrix (in the case of banks in Bosnia and Herzegovina, Serbia, Croatia and Slovenia), it can be seen that the strongest positive non-performing loans as dependent variable have influenced the following independent variables: the size (0.314), the bank concentration (0.158) and the gross domestic product. On the other hand, the weakest observed causality is expressed between the non-performing loans and the net interest margin (-0.036) and the capital adequacy ratio.

In the financial markets in transition, the commercial model was taken over by the commercial banks, where the dominant role is played by 4 to 5 major foreign banks, which in one hand have an oligopoly position. In the foreseeable period, the observed banks approved loans without a specific selection of debtors in order to achieve high and secure profits as a result of the high difference between active and passive interest rates.

In this sum of approved loans, the category of non-performing loans was due to weakened payer's ability on the one hand, and bad selection on the other hand. In terms of statistical sense, there is a close connection between low-quality loans as indicators of potential instability and bank concentration.

The preceding VIF cutoffs were considered to be multicollinear, which were set at the industry level. Each variable that has a higher VIF than 3 was considered as multi collinear and was dropped from the model. In the case of multicollinearity, coefficients of the variables became unstable and standard errors were inflated.

Table 6. Multi-collinear analysis via variance inflation factor for all observed countries (VIF)

Variable	VIF	1/VIF
NIM	2.12	0.47169
CAR	2.42	0.41301
SIZE	2.35	0.4255
GDP	2.12	0.4255
BC	5.34	0.1873
MeanVIF	2.87	

Source: Author's calculation

As it can be seen in the previous table, each individual independent variable for all observed countries have a VIF coefficient value less than 3 or 3, but not more than 3. It is clear that there is no multicollinearity between the variables, so the set model is valid. The table shows the correlation between NPLs and independent variables. The coefficient of determination between the NPLs and the independent variables is 79.17%, while the adjusted determination coefficient is 74.43% which means that there is 74% change in the independent variables to the dependent relation.

Table 7. The basic model of regression analysis between the dependent variable (NPLs) of the countries of the Western Balkans for the period: 2010– 2016

Source	SS	df	MS			
Model	371.20	5	74.24	Number of observations	27	
Residual	97.67	22	4.44	F (5,42)	16.72	
Total	468.87	27	78.68	Prob >F	0.000	
				R-squared	0.7917	
				Adj R-squared	0.7443	
				Root MSE	2.107	

NPLs (dependent)	Coef.	Std. Err.	t	P>[t]	[95% Conf . Interval]	
NIM	-0.512	0.779	-0.66	0.518	-2.129	1.105
CAR	-0.149	0.038	-3.88	0.001	-0.230	-0.069
GDP	1.60e-10	4.06e-11	3.93	0.001	7.53e-11	2.44e-10
SIZE	0.028	0.048	0.59	0.560	-0.072	0.129
BC	0.309	0.057	5.40	0.000	0.191	0.429
_cons	-0.395	4.351	-0.09	0.928	-9.418	8.627

Source: Author's calculation

The table 7 shows that the highest positive correlation was recorded between the non-performing loans and the gross domestic product. Also, the positive correlation between non-performing loans was achieved with the following independent variables: the bank concentration (0.309) and the size (0.028). Therefore, the reduction of the capital adequacy ratio by one unit other factor remaining constant leads to increase of the non-performing loans by 0.149 units. This result is quite logical because banks create in their balance sheet provisioning based on toxic loans that are transformed into costs if the receivables are not charged. In terms of testing the zero and alternative hypotheses through the empirical and theoretical value of the F test, we came to the next conclusion. The empirical value of the F test for 5 degrees of freedom in the numerator and 22 in the denominator was 16.72. The obtained empirical value of the F test is 16.72, which is more than the theoretical value (2.66), which rejects the zero hypothesis and confirms the alternative hypothesis, and also confirms the individual influence of independent variables on the dependent variable.

CONCLUSION

This paper analyzes the determinant of the financial stability of the banking sector of Western Balkan countries for the period between 2010 and 2016, using multiple linear regression model. The results of the ANOVA test show that the strongest correlation was achieved with gross domestic product, bank concentration as well as size. The stability of economic activity followed by the steady growth of the gross domestic product and domestic and foreign demand for domestic products depends on the stability of the financial system, i.e., banks as a model of financial intermediation.

The concentration of banks in the countries of the Western Balkans ranges from moderate to advanced, which may pose a potential threat to the stability of the financial system and to increase rates of non-performing loans. On the other hand, the weakest correlation between non-performing loans as dependent variables was achieved with the capital adequacy ratio as well as with the net interest margin. The null hypothesis was rejected because it did not show that the independent variables affect the dependent variable. An alternative hypothesis is accepted because a significant influence of the selected independent variables on non-performing loans has been shown.

The results of the research led to the conclusion that the financial stability of banks in the Western Balkans countries is primarily determined by specific bank performance, as well as the industry-specific and certain macroeconomic indicators. Future research by the authors on the given subject can be expanded depending on the availability of the database and the longer time series, as well as by including new variables that monitor financial stability in order to obtain better results.

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DYNAMIC ANALYSIS OF REGIONAL STOCK MARKET PERFORMANCE

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Abstract: *Dynamic changes in the financial systems of developed economies, accompanied by marked globalization and internationalization of financial flows, financial engineering, deregulation, and intensive information technology development, have influenced the intensive development of financial markets. This has brought the development of the stock market. Efficiency and quality of stock market operations are in a positive correlation with economic growth and development of countries developing the financial system based on the functioning of the capital market. Countries that have the stock market developed simultaneously have higher economic growth rates than countries in which stock markets are underdeveloped. In this regard, countries with developed stock markets have more intensive economic growth than countries in which stock markets are shallow and illiquid. In accordance with the above, the research objective is to perform a comparative assessment of relative efficiency and stock market ranking of the countries of Southern Europe (Serbia, Croatia, Bosnia and Herzegovina with its two stock markets, Sarajevo and Banja Luka, Romania, and Bulgaria) using the DEA method, through the performance analysis of six regional stock markets in the observed countries. For the needs of the analysis, a dynamic approach is applied, with ten input-oriented linear CCR DEA models developed and simultaneously resolved, which correspond to the observed period 2007-2016. Results obtained using the DEA model and the DEAFrontier software package show the relative inefficiency and poor performance of regional stock markets over the observed period and confirm the overall assessment of the stock market situation in the region. Comparative overview of the achieved relative and average relative efficiency shows that most regional stock markets in the observed period are relatively inefficient, with the exception of 2007. The Bucharest stock market has the best performance in terms of the achieved average relative efficiency, followed by the Zagreb Stock Exchange, the Sarajevo Stock Exchange, the Banja Luka Stock Exchange, the Belgrade Stock Exchange, and the Sofia Stock Exchange.*

Key words: *stock market, relative efficiency, DEA, market capitalization, gross domestic product*

JEL Classification: *C61, G20, O40*

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INTRODUCTION

Stock market, as a form of organized financial market, is a service-providing financial institution that allows standardized, mass, and continuous transfer of funds within direct financial flows. Thanks to economies of scale, financial transactions are carried out with lower transactional costs. Companies on the stock market pass through a strict registration procedure with the state securities commission, so the risk of securities on the stock market is lower, with shorter time and lower transaction costs of conducting financial transactions. Efficiency and quality of stock market operations are in a positive correlation with economic growth of developed economies, whose development is based on the capital market. It is evident that countries with developed stock market simultaneously have higher economic growth rates (Duca, 2007) than countries in which stock markets are underdeveloped. The developed stock market stimulates the inflow of investment, improves capital allocation, reduces transaction costs (Bencivenga et al., 1996), diversifies risk (Levine, 1996), and promotes economic growth. The stock market enables investors to acquire assets that they can sell at any time and thus reduce the investment risk. High stock market liquidity, through risk division, reduces capital costs and increases stock market efficiency.

Considering the importance of the stock market for long-term economic growth, each national economy needs to adapt its own development strategy to improve the efficiency of stock market operations by using existing scientific knowledge and developing new theoretical and methodological frameworks. In this regard, the research subject is the analysis of regional stock market performance. The purpose of the paper is not to focus on the relationship between economic growth measured by gross domestic product and stock market development indicators expressed by market capitalization and turnover volume, but to use the DEA model to evaluate the relative financial efficiency of regional stock markets, its trend and links with the world financial crisis that marked the observed period. The goal is to demonstrate that the relative financial efficiency of the observed stock markets, evaluated by the DEA method, is in line with the performance indicators obtained using traditional methods. In addition, through a dynamic analysis of regional stock market performance, assumptions are made for the identification of stock markets with the highest relative financial efficiency, which may be leaders in attracting foreign capital and the development of integration processes.

REVIEW OF LITERATURE

Development of the banking sector and the stock market are the most important empirically validated variables that are correlated with economic growth performance (Levine & Zeruos 1998, Garcia & Liu 1999, Levine et al. 2000). Financial theorists are debating for decades whether the stock market is a substitute or complement to banks, or if one source of funding is better than another. In this regard, many of them claim that financial intermediaries and stock markets reduce information and transaction costs, thereby encouraging efficient allocation of resources and faster long-term growth. Others believe that the stock market cannot improve the allocation of financial resources and corporate governance in the same way as banks (Stiglitz, 1985, Bhide, 1993). On the other hand, some theorists (Allen & Gale, 2000) argue that stock markets mitigate the inefficient monopoly power banks use, i.e. that competitive nature of the market encourages innovative growth-stimulating activities versus the conservative approach of banks. Finally, some theorists state that there is no room to talk about an issue of choosing between banks and the market, as both components of the financial system improve the information of market participants and lower transaction costs (Beck & Levine, 2004).

Unlike banking-oriented financial systems where banks through numerous and diverse banking loans provide sources of financing to economic growth, in market-oriented financial systems

stock markets are the driving factor of economic growth. The development of the stock market is the key to fostering long-term economic growth, as it facilitates resource allocation, capital accumulation, and technological innovation (Rudra et al., 2015).

The final outcome is that economies in which financial systems are successful in achieving the objectives set have a tendency to grow faster over a long period of time (Levine, 2005, Demirgüç-Kunt & Levine, 2008). Less developed countries with a weakened financial system are in a vicious circle, in which a low level of financial development leads to poor economic performance, and low economic growth leads to poor financial development (Funk, 2009). The author states that the link between financial development and economic growth is stronger at an early stage of economic development, and that the link weakens as economic growth becomes more and more sustainable. Therefore, underdeveloped economies are trapped in poverty, which explains the profound divergence between developed and poor countries.

Abundant evidence from developed markets shows that key macroeconomic variables, such as gross domestic product, private investment, employment rates, and similar, are in a positive correlation with stock market development indicators (Levine et al., 2000, Cooray, 2010, Shin, 2013, Wang & Azam, 2016). These are indicators of size, activity, stability and liquidity. However, on developing markets, such as the markets of Southeast Europe, Latin America, Africa, and certain Asian markets, no significant impact of the stock market on economic growth has been noticed (Wang & Ajit, 2013, Osamwonyi & Kasimu, 2013, Mo, 2017). Most of the studies point to a positive correlation between macroeconomic variables and the banking sector development indicators, abstracting the stock market development variables (Demirgüç - Kunt & Maksimovic 1998; King & Levine, 1993; Levine, 1997; Misati & Nyamongo, 2011a, 2011b; Nyamongo, Misati, Kipyegon, & Ndirangu, 2012). This gives an unbalanced view of the contribution of financial sector development to economic growth (Ngare et al., 2014).

METHODOLOGY

Data envelopment analysis (DEA, Charnes et al, 1978) is a mathematical, non-parametric approach to calculating efficiency, which does not require a specific functional form. It is used to evaluate decision-making units (DMUs) by reducing multiple input variables to a single “virtual” input and multiple output variables to a “virtual” output using weight coefficients. The DEA methodology proved to be adequate especially when evaluating the efficiency of non-profit organizations operating outside the market, because in their case performance indicators such as revenue and profit do not measure efficiency in a satisfactory way. Unlike typical statistical methods, data envelopment analysis is based on benchmarking, comparing each decision-making unit with only the best DMU. Data envelopment analysis is a set of models and methods based on linear programming, allowing one to calculate unit efficiency within a group of organizations. All data on input and output variables for each of the n decision-making units is inserted into a particular linear program that is actually the corresponding one of the n formed DEA models. Thus, the efficiency of the observed decision-making units is evaluated, which in fact represents the ratio of weights of output variables and weights of input variables. Data envelopment analysis is about relative efficiency because decision-making units are viewed in relation to others. Efficiency ranges from 0 to 1, and each deviation from 1 is attributed to excess output or missing input. If the number of efficient decision-making units is unrealistically large, it is possible to limit the values of weight coefficients of input and output variables or use other approaches to reduce the number of efficient DMUs (Sherman & Zhu, 2006; Cooper et al., 2011; Cook & Zhu, 2008). An important step in applying the DEA method is to select appropriate inputs and outputs. One of the basic principles in defining input and output components of the DEA model is that their number is as small as possible, but without compromising the representativeness of the model. In this respect, the literature suggests that the number of decision-making units must be

at least two or even three times larger than the total number of inputs and outputs (Golany & Roll, 1989; Banker et al., 1989; Charnes et al., 1994; Cook et al., 2017; Subramanyam, 2017). Second, highly correlated inputs or outputs are superfluous and can be eliminated without affecting the model efficiency (Cook et al., 2014). Inputs that do not affect any output show that the set of outputs is incomplete, or that there are resources that do not produce any measured result, and such inputs must be eliminated from the model. The difference between inputs and outputs refers to the interest to decrease or increase certain variables, positively affecting DMU performance. In the literature, there are several extensions of the DEA model (Banker et al., 1989), among which a number of additive and multiplicative models should be mentioned (Charnes et al., 1994), while Thrall (1996) provides a comparative analysis of all the classic DEA models.

RESULTS AND DISCUSSION

For a comparative assessment of the relative financial efficiency of the observed regional stock markets, a corresponding DEA model is structured based on the following assumptions:

- a) Six regional stock markets are being considered: Belgrade, Zagreb, Sarajevo, Banja Luka, Bucharest, and Sofia Stock Exchange. Decision-making units are chosen in accordance with the principle of similarity in the formation of the DEA model (Dyson et al., 2001). Bearing in mind that the Southeast Europe economies have faced great structural changes in the last two decades, and that the privatization process has had the key role in their financial development, which enabled the creation of stock exchange material, i.e. securities traded on the stock market, thus providing sources of financing for economic growth, the key question is – is the development of the analyzed stock markets stable? Given that some of the analyzed countries implemented reforms shortly after the change in the political regime and successfully integrated into the EU, and after initial transition period recorded solid growth, while other countries progressed slower in creating a market-oriented economy, the second question that arises is – is the relative efficiency of the stock market conditioned by the country's accession to the European Union? And secondly, to what extent does the relative financial efficiency trend of the observed stock markets coincide with the emergence, development, and completion of the last global financial crisis? The above questions are the key research tasks in this paper. The key role in response to the first research task belongs to stock market development indicators, and in response to the second research task, research attention will be focused on the dynamic analysis of regional stock market performance.
- b) The observed period is 2007-2016;
- c) A set of decision-making units (DMUs) made up of time units expressed in years for the period 2007-2016 has been established;
- d) The gross domestic product in the observed year has been identified as the output variable, with the idea of simultaneously examining the impact that the observed stock market performance has on its trend;
- e) The input variables are: I1 – market capitalization, I2 – total turnover on the stock market in the observed year, I3 – number of listed companies. The choice of input and output variables in the model is based on key performance indicators of the stock market. One of the basic indicators used to look at the capacity and performance of a stock market is its market capitalization. Market capitalization, as a product of a number of securities and their market price, is an indicator of market readiness to respond to demand. In addition, the share of market capitalization in gross domestic product (GDP) is an indicator of the size of the observed market. High market capitalization does not mean an active market at the same time. A large but inactive market has high capitalization, but a small volume of turnover. Therefore, financial theory also uses a number of other indicators of stock market development, such as indicators of activity (ratio of turnover value and GDP), liquidity (efficiency) (turnover and market capitalization ratio or *bid-*

ask spread), and stability (stock exchange index volatility, P/E ratio, duration, etc.). According to these ratios, the authors have determined that market capitalization, total turnover, and the number of listed companies make up the input variable, and the GDP is the output variable.

The important assumptions underlying the valid application of the DEA model are defined by the principle of *homogeneity*, or the similarity of the decision-making units, the *positivity* of the input and output variables, the *isotonicity* feature implying that the increase in input results in the same increase in output without reducing any other inputs, as well as the optimal number of input and output variables that fully measures the effect of decision-making units and is common to all decision-making units (for more details on the practical application of the DEA method, see: Dyson et al., 2001; Sarkis, 2002). Since the number of decision-making units should be greater than $2mxn$, where m is the number of input variables and n the number of output variables, the total number of inputs and outputs in this case should not be greater than five, as, as suggested by numerous studies, the number of DMUs in the observed setup should be sufficiently greater than the total number of inputs and outputs, because of the risk that the majority of DMUs will be classified as efficient precisely because of the characteristic of the DEA to display each unit as best as possible (Banker et al. 1989; Gollany& Roll, 1989; Charnes et al. 1994; Cooper, Seiford, & Tone, 2000; Dyson, 2001; Sarkis, 2002; Cook et al. 2017). Since the assumption of isotonicity underlies the application of the DEA method, it is necessary to check the dependence between the selected groups of input variables and the output variable of the model. Scientific and professional literature offer different approaches to selecting inputs and outputs, and the most commonly used are correlation and regression analysis. The correlation analysis (Table 2) on Belgrade's examples shows that in all three cases the zero hypothesis is accepted, i.e. p is greater than 0.05, which means that there is no statistically significant contribution of independent (input) variables to dependent (output) variable. A similar situation exists with other stock markets, the value of the correlation coefficient showing that there is no significant impact of stock market performance on the region's GDP trends. In addition, there should be no correlation within the input variable group, and, in this sense, a new DEA model is structured, in which the *market capitalization* factor represents the output variable and the factor of the *number of the listed companies* represents the input variable because the value of the correlation coefficient between these two variables is positive and high (0.799). The value of the correlation coefficient is extremely high between the *number of listed companies* and *market capitalization* (0.964).

Table 1 Descriptive statistics for the Belgrade Stock Exchange

DMU (Year)	I1 – Market capitalization	I2 – Total turnover	I3 – Number of listed companies	O1 – GDP
2007	29,6	3,09	1771	40,29
2008	15,33	1,19	1750	49,26
2009	14,29	0,68	1569	42,62
2010	4,16	0,31	1322	39,46
2011	4,06	0,38	1086	46,47
2012	5,62	0,28	751	40,74
2013	5,6	0,24	799	45,52
2014	5,77	0,15	828	44,21
2015	4,97	0,17	751	36,51
2016	4,29	0,32	796	37,7

Source: Authors

On the other hand, highly correlated elements within the groups of input and output variables can be eliminated, so instead of the model with one input and two output variables, a DEA model with two components is formed, the input I1 – the *number of listed companies* and the O1 output – *market capitalization* which, in relation to the number of decision-making units, is acceptable

and at the same time adequately reflects and represents the relevant stock market performance. An input-oriented DEA model with constant return (CCR) is used to evaluate efficiency. Below are the results of the applied DEA model on the example of the Belgrade Stock Exchange, as well as consolidated results for other stock markets, while appendix gives their descriptive statistics.

Table 2 Correlation coefficient matrix

		I1	I2	I3	O1
I1	R	1,0000			
	<i>R Standard Error</i>				
	<i>t</i>				
	<i>p-value</i>				
	<i>H0 (5%)</i>				
I2	R	0,9640	1,0000		
	<i>R Standard Error</i>	0,0088			
	<i>t</i>	10,2601			
	<i>p-value</i>	7,0053E-6			
	<i>H0 (5%)</i>	<i>rejected</i>			
I3	R	0,7992	0,7463	1,0000	
	<i>R Standard Error</i>	0,0452	0,0554		
	<i>t</i>	3,7610	3,1718		
	<i>p-value</i>	0,0055	0,0132		
	<i>H0 (5%)</i>	<i>rejected</i>	<i>rejected</i>		
O1	R	0,1018	0,0396	0,3289	1,0000
	<i>R Standard Error</i>	0,1237	0,1248	0,1115	
	<i>t</i>	0,2894	0,1122	0,9851	
	<i>p-value</i>	0,7796	0,9135	0,3534	
	<i>H0 (5%)</i>	<i>accepted</i>	<i>accepted</i>	<i>accepted</i>	

R		
<i>Variable vs. Variable</i>	<i>R</i>	<i>No# of valid cases</i>
<i>I2 vs. I1</i>	0,9640	10
<i>I3 vs. I1</i>	0,7992	10
<i>I3 vs. I2</i>	0,7463	10
<i>O1 vs. I3</i>	0,3289	10
<i>O1 vs. I1</i>	0,1018	10
<i>O1 vs. I2</i>	0,0396	10

The corresponding input-oriented CCR DEA model, with one input variable – the number of listed companies, and one output variable – market capitalization, for the j -th DMU, in this case reads as follows:

$$\begin{aligned}
 \max h_{j0} &= u_{1j0} \times y_{1j0}, \\
 \text{S.t.} \quad & v_{1j0} \times x_{1j0} = 1 \\
 & u_1 \times y_{1j} - v_1 \times x_{1j} \leq 0 \quad j=1,\dots,10 \\
 & u_1 \geq 0 \\
 & v_1 \geq 0
 \end{aligned}$$

where:

y_{1j} – value of the output variable, *market capitalization*, in the j -th year;

x_{1j} – value of the input variable, *number of listed companies*, in the j -th year;

u_{1j0} – weight coefficient of the input variable, *number of listed companies*, in the j -th year;

v_{1j0} – weight coefficient of the output variable, *market capitalization*, in the j -th year.

For the purposes of analyzing and evaluating the relative financial efficiency of the regional stock markets, 10 input-oriented CCR DEA models were developed simultaneously, which correspond to the observed period 2007-2016. The analysis of the results obtained using the DEA model and the DEA Frontier software package shows the poor performance of the regional stock markets over the observed period, with performance evaluation expressed as relative efficiency in the range 0 to 1. Table 3 shows the relative financial efficiency trend of the Belgrade Stock Exchange in the period 2007-2016. Only in 2007, relative financial efficiency was 100%, so it can be seen as a kind of benchmark. In the remaining years, the Belgrade Stock Exchange was relatively financially inefficient, ranging from 18.82% in 2010, which is the lowest value, to 54.49% in 2009, which is the highest efficiency after 2007. Generally speaking, over the entire period, the Belgrade Stock Exchange was relatively and extremely inefficient, if the number of listed companies and market capitalization are taken as determinants of efficiency. Figure 2 gives a comparative overview of the number of listed companies and the relative financial efficiency of the Belgrade Stock Exchange in the observed period. As can be seen, the decline in the number of listed companies is accompanied by a fall in relative financial efficiency, but the fall in the efficiency curve is more drastic and under greater slope in the period 2007-2012. After that, there is a stable movement of both curves, to a great extent consistent. The correlation coefficient between these two variables is 0.56, but given that $p = 0.914$, the zero hypothesis is accepted, i.e. there is no correlation between them. Table 5 gives the optimal values of the weight coefficients of the input variable, i.e. its relative importance by years, where the Belgrade Stock Exchange achieves relative efficiency equal to 1. These weight coefficients have a managerial and analytical value. The value of the weight coefficient of the input variable total turnover ranges from 0.00056, which is the lowest value in 2007, to 0.00133, as the highest values in 2012 and 2015. This means that the relative financial efficiency of the Belgrade Stock Exchange in 2008 would be 0.057% higher, if the number of listed companies was smaller by one, i.e. by 1.33% in 2012 and 2015. Its relative financial efficiency would be 100% if the number of listed companies was 917 instead of 1750 in 2008, 336 instead of 751 in 2012, etc. (Table 4). On the other hand, any increase in market capitalization by one unit of measure would increase the efficiency of the Belgrade Stock Exchange by 3.419% in 2008, or 7.967% in 2012 and 2015. A similar analysis can be done for other years and points to the very unfavorable structure of companies listed on the Belgrade Stock Exchange.

Overview of the achieved relative efficiency (Figure 3) and average relative efficiency (Figure 4) shows that, in general, all stock markets in the region had poor performance in the observed period, characterized by low average financial efficiency, with the best performance from the aspect of the achieved average relative efficiency and the best ranking recorded on the Bucharest Stock Exchange (0.705), followed by the Zagreb Stock Exchange (0.625), the Sarajevo Stock Exchange (0.561), the Banja Luka Stock Exchange (0.539), the Belgrade Stock Exchange (0.448), and the Sofia Stock Exchange (0.340), which in the observed period had the worst performance. This means that the Bucharest Stock Exchange worked on average with 70% efficiency in the observed period, Zagreb with 62.5%, etc., but, in general, on average, all stock markets in the observed period were relatively inefficient. Table 4 shows the target values of the input variable for the Belgrade Stock Exchange in the observed period. It is easy to notice that in all years, except 2007, that is, just before the onset of the global economic crisis, there is a significant deviation of the target and realized values of the input variable *number of listed companies*, which points to the conclusion that unit relative efficiency could be achieved with significantly lower number of listed companies but with higher turnover on the stock market. It is also noticeable that in 2008, for most of the developed regional stock markets, relative financial efficiency was the lowest, which can be explained by their expected and pronounced sensitivity to the initial effects of the global financial crisis (Table 6). With the Belgrade and Banja Luka, and somewhat the Zagreb Stock Exchange, the impact of the global financial crisis

had a delayed effect and was felt somewhat later, in 2010, precisely because of their underdevelopment, insufficient integration in the world financial flows, and, therefore, the resistance of the financial market, and lasted until 2012, so the trend of their relative financial efficiency is in line with this impact.

Table 3 Efficiency of the Belgrade Stock Exchange in the period 2007-2016

DMU	Input – oriented CRS Efficiency	Sum of lambdas	RTS	Optimal Lambdas with Benchmarks
2007	1,00000	1,000	Constant	1,000 (2007)
2008	0,52412	0,518	Increasing	0,518 (2007)
2009	0,54492	0,483	Increasing	0,483 (2007)
2010	0,18827	0,141	Increasing	0,141 (2007)
2011	0,22368	0,137	Increasing	0,137 (2007)
2012	0,44774	0,190	Increasing	0,190 (2007)
2013	0,41934	0,189	Increasing	0,189 (2007)
2014	0,41694	0,195	Increasing	0,195 (2007)
2015	0,39595	0,168	Increasing	0,168 (2007)
2016	0,32246	0,145	Increasing	0,145 (2007)

Source: Authors

Table 4 Target values of the input variable in the observed period – Belgrade Stock Exchange.

DMU	<i>Efficient Input target I1</i>	Realized I1
2007	1771,0000	1771
2008	917,21047	1750
2009	854,98615	1569
2010	248,89730	1322
2011	242,91419	1086
2012	336,25068	751
2013	335,05405	799
2014	345,22534	828
2015	297,36047	751
2016	256,67534	796

Source: Authors

Table 5 Optimal values of weight coefficients of input and output variables by years

Year	u_{1jo} (I1)	v_{1jo} (O1)
2007	0,00056	0,03378
2008	0,00057	0,03419
2009	0,00064	0,03813
2010	0,00076	0,04526
2011	0,00092	0,05509
2012	0,00133	0,07967
2013	0,00125	0,07488
2014	0,00121	0,07226
2015	0,00133	0,07967
2016	0,00126	0,07516

Source: Authors

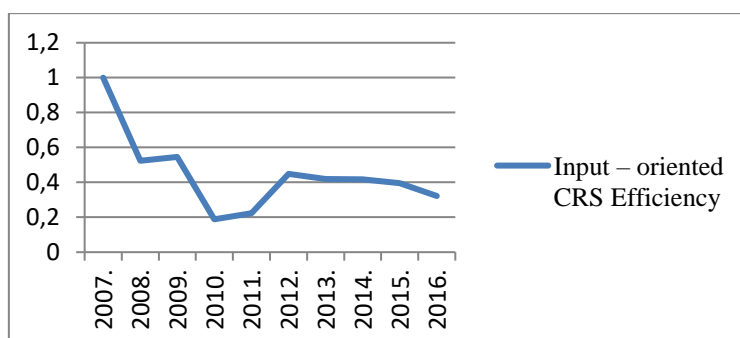


Figure 1 The trend of efficiency of the Belgrade Stock Exchange

Source: Authors

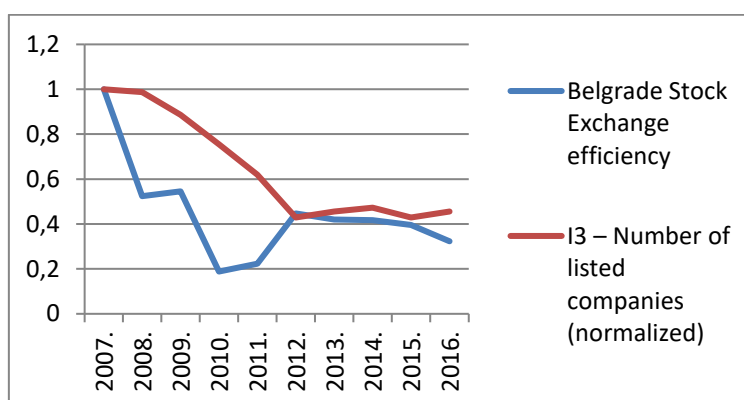


Figure 2 Comparative overview of trend in the number of listed companies and the relative financial efficiency of the Belgrade Stock Exchange in the period 2007-2016

Source: Authors

Table 6 Comparative overview of the achieved relative financial efficiency of regional stock markets in the period 2007-2016

DMU	Belgrade Stock Exchange	Zagreb Stock Exchange	Sarajevo Stock Exchange	Banja Luka Stock Exchange	Bucharest Stock Exchange	Sofia Stock Exchange
2007	1,00000	1,00000	0,82430	1,00000	1,00000	1,00000
2008	0,52412	0,38961	0,37584	0,47502	0,42168	0,37428
2009	0,54492	0,50219	0,40030	0,48275	0,70113	0,37008
2010	0,18827	0,54512	0,36416	0,45852	0,75402	0,32222
2011	0,22368	0,49435	0,32604	0,45531	0,47273	0,35746
2012	0,44774	0,53790	0,31485	0,45215	0,64852	0,19668
2013	0,41934	0,59752	0,32867	0,47315	0,87547	0,20246
2014	0,41694	0,62489	0,77983	0,51590	0,74807	0,19638
2015	0,39595	0,67012	0,89834	0,55575	0,73895	0,17522
2016	0,32246	0,88894	1,00000	0,52832	0,69799	0,20567

Source: Authors

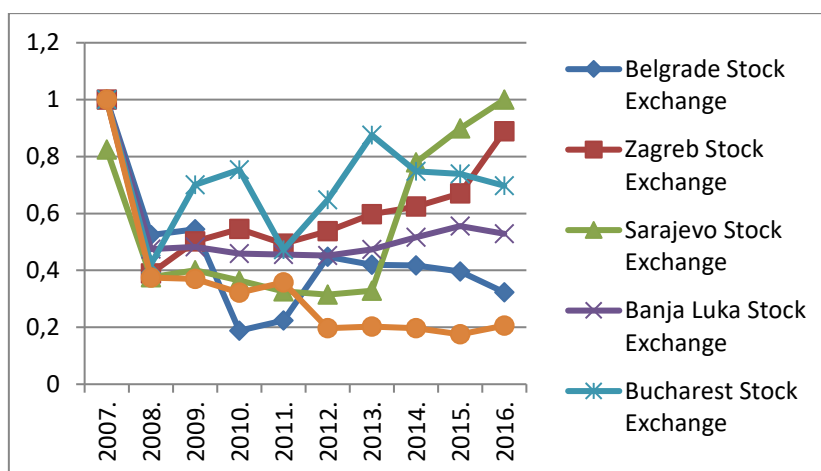


Figure 3 Trends in relative financial efficiency of regional stock markets in the period 2007-2016

Source: Authors

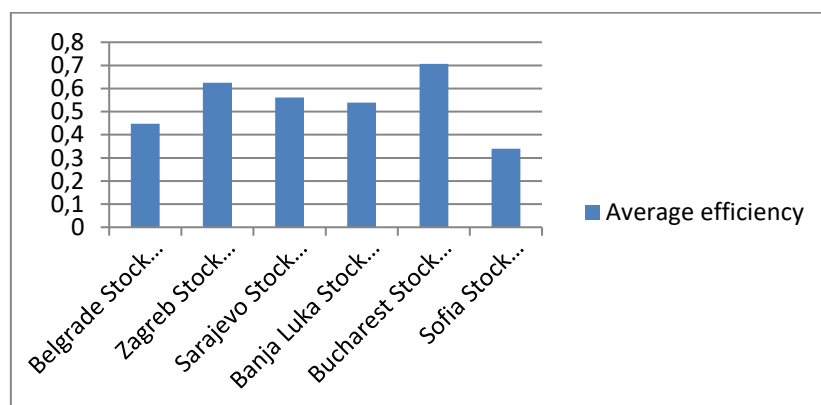


Figure 4 Comparative overview of the achieved average relative efficiency of regional stock markets in the period 2007-2016

Source: Authors

CONCLUSIONS AND RECOMMENDATIONS

An analysis of the relative efficiency trend of regional stock markets shows that the trend was relatively uncoordinated, as a result of a number of local specifics. Low liquidity and the debatable quality of investment alternatives lead to frequent oscillations in the value of stock exchange indexes. Frequent oscillations in the change in the value of stock exchange indexes are also caused by the fact that the subject of the analysis was markets with an insufficiently diversified structure of financial instruments. On the other hand, developed stock markets have a greater market breadth and depth, i.e. they have a more diverse structure of financial instruments and a better market willingness to respond to demand. Consequently, fluctuations on such markets are less.

The results of the conducted survey show that the relative efficiency has a similar direction on the Belgrade, Bucharest, Zagreb, and Banja Luka stock markets, and that, on the other hand, the Sofia and Sarajevo stock markets deviate from the relative efficiency direction of listed stock exchanges. This shows that, regardless of the fact that in some of the analyzed countries the transition process has been completed earlier and secured them entry into the European Union, the stock market events in the analyzed region were affected by global events considerably more than by domestic macroeconomic factors and political quakes. Bearing in mind the above, it should be noted that the economic power of countries whose stock markets were subject to

analysis is relatively weak and that, therefore, the economies of these countries are not independent of global developments. Although some markets (Serbia, BiH) are not part of a single European Union market, they are not independent because they are geographically linked.

When it comes to the analyzed region, it should be kept in mind that it is characterized by bank-centric financial systems, rather than market-oriented financial systems. The dominance of banks in the balance sheet structure and the insufficient presence of institutional investors (pension funds, investment funds, and insurance companies) indicate that bank loans are used as key sources of financing, rather than funds obtained by issuing securities on the stock market. On all markets, foreign investors are insufficiently represented, because they have a market size problem. On the other hand, domestic investors are not able to significantly influence the changes in the prices of securities.

The existing foreign research and this study supplemented literature in this research area, and made the first research step when it comes to domestic literature. The motive for the conducted research is to show the degree of agreement on the regional stock markets through monitoring the relative efficiency of regional stock markets.

In practical terms, the possible contribution of the conducted research is reflected in the application of the DEA method to monitor the relative efficiency of regional stock markets and understand the importance of methods for dynamic analysis of stock market performance. The results of the analysis can be characterized as preliminary research with the aim of presenting the methodological aspects of future work with a larger database and a greater number of variables.

The following example begins to replicate the complexity and analytical capabilities of DEA in a real application. DEA is applied to a data set where it is much more difficult to observe the inefficiencies. The example also clarifies relative strengths of DEA over ratio analysis. While we do not compare other performance management techniques directly in this example, the reader is encouraged to consider the techniques they currently use and consider whether the DEA would complement those techniques, whether DEA could replace existing methods, or whether there are reasons that DEA would add no valuable insights.

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APPENDIX

Zagreb Stock Exchange				
Year	GDP	Market capitalization	Total turnover	Number of listed companies
2007	60,09	70,22	4,39	359
2008	70,48	27,13	3,22	356
2009	62,70	26,62	1,46	271
2010	59,68	25,59	1,05	240
2011	62,25	22,53	0,93	233
2012	56,49	22,20	0,54	211
2013	57,77	22,44	0,55	192
2014	57,14	23,59	0,54	193
2015	48,73	24,38	0,61	186
2016	58,33	27,82	0,55	160

Sarajevo Stock Exchange				
Year	GDP	Market capitalization	Total turnover	Number of listed companies
2007	15,78	5,88	0,72	814
2008	19,10	2,76	0,27	838
2009	17,60	2,88	0,13	821
2010	17,16	2,62	0,06	821
2011	18,63	2,26	0,14	791
2012	17,21	2,05	0,21	743
2013	18,15	2,14	0,06	743
2014	18,52	2,18	0,35	319
2015	15,99	2,59	0,70	329
2016	19,00	2,48	0,43	283

Banja Luka Stock Exchange				
Year	GDP	Market capitalization	Total turnover	Number of listed companies
2007	4,2	4,76	0,42	760
2008	4,85	2,27	0,16	763
2009	4,7	2,31	0,1	764
2010	4,74	2,24	0,1	780
2011	4,94	2,23	0,24	782
2012	4,9	2,24	0,06	791
2013	4,99	2,35	0,07	793
2014	5,03	2,53	0,11	783
2015	5,25	2,44	0,05	701
2016	5,44	2,26	0,07	683

Bucharest Stock Exchange				
Year	GDP	Market capitalization	Total turnover	Number of listed companies
2007	171,54	30,64	2,79	54
2008	208,18	16,27	2,82	68
2009	167,42	27,45	2,69	69
2010	167,99	31,66	1,77	74
2011	185,36	21,19	3,28	79
2012	171,66	29,07	2,16	79
2013	191,55	41,23	3,29	83
2014	199,32	35,23	3,90	83
2015	177,95	35,22	2,19	84
2016	187,00	34,06	2,28	86

Bulgaria Stock Exchange in Sofia				
Year	GDP	Market capitalization	Total turnover	Number of listed companies
2007	44,77	21,67	6,78	369
2008	51,78	8,88	1,31	404
2009	54,67	8,65	0,49	398
2010	51,78	7,38	0,38	390
2011	49,94	8,25	0,32	393
2012	56,95	4,47	0,36	387
2013	53,57	4,53	0,88	381
2014	56,72	4,44	0,97	385
2015	48,95	3,90	1,10	379
2016	143,10	4,01	0,79	332

CHALLENGES OF TRANSITION TO CASHLESS SOCIETY

Nenad Tomić¹, Violeta Todorović²

Abstract: *The first papers on the topic of electronic payments have emphasized anonymity as the ultimate characteristic that electronic substitutes of cash need to possess. A large number of authors considered that users would be willing to use electronic money systems only if their functioning completely matches with cash. The untraceability of performed transactions would ensure the full safety of the user's personal and financial data. However, at the end of the 1990s, electronic money systems were losing significance, while systems based on the existing payment infrastructure came into focus. In order to use them, a customer does not need to open new accounts or to buy new forms of assets. Therefore, their usage is easier than the one of electronic money systems. It is required to register, when customer provides personal data and also data about payment instruments he wishes to use. Since all payment instruments are issued by commercial banks or other payment institutions, the entire history of transactions made by this class of electronic payment systems can be monitored.*

After numerous affairs which showed that personal data in the era of digital business are unsafe, public attention is increasingly focused on the loss of privacy. Numerous electronic devices, such as various types of computers and mobile phones, as well as communication networks such as the Internet, GSM and GPS, generate a mass of data that can be misused. By their intensive analysis, a customer can be followed not only by location and communication, but it is also possible to determine his interests and needs. In this context, calls for a complete transition to electronic payments and the elimination of cash do not seem as a step forward on the road of technical progress, but open up new security issues. One of the problems may be the unprepared technological infrastructure, which in combination with the insufficient technological skills of population creates opportunities for misuses. The second problem concerns the development of totalitarian tendencies in society, because electronic payment system operators can behave restrictively to disobedient individuals or enterprises.

The problems that would undoubtedly arise during transformation of modern societies into a cashless economies makes the subject of this paper. The aim of the paper is to point out the danger to the safety of private data and financial resources of customers in this process. The idea of elimination of cash is clarified in the first part of the paper and the positive aspects of this plan are pointed out. In the second part, the problems of systemic threat to privacy that can be encountered are critically analyzed. Potential restrictions on cash elimination process are pointed out are presented in the third part.

Keywords: *cashless society, mobile payments, electronic payments, loss of privacy*

JEL Classification: *E 40, E 42, E 50*

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INTRODUCTION

The development of electronic payments theoretical basis is connected to the work of David Chaum (1983), with which the concept of blind signature was introduced for the first time as the base for electronic money development. In the short period, large number of authors accepted this idea, so by the end of eighties and beginning of nineties of 20th century, there were different theoretical concepts of electronic payments (Neuman & Medvinsky, 1995). The primary goal of these considerations was the creation of electronic money, which could be transported between the users via information communication technologies, with preserving the key features of cash payments. Okamoto and Ohta (1991) and Matonis (1995) identified necessary characteristics of electronic money, among which Chaum (1992), and Lynch and Lundquist (1996) emphasized anonymity as the ultimate one. It was thought that inability to control performed transactions would provide complete security of personal and financial data of users.

However, by the end of 20th century, electronic money systems lost their importance and the central spot was taken by the systems based on the existing payments infrastructure. It was not necessary to open new accounts or to buy new asset forms in order to use them, so their use was simpler than the use of electronic money. The registration was required, which obliged user to provide not only personal data but information about payment instruments he/she wanted to use as well. Bearing in mind that all payment instruments are issued by banks or other payment institutions, we can conclude that complete payment history could be tracked. The new change on the market of electronic payment systems occurred in the beginning of the second decade of 21st century on two levels. On the one hand, mobile phones breakthrough from the segment of business users to the segment of private users, contributed to the evolution of the electronic payment concepts and appearance of mobile payments. Due to the great importance of mobile phones in everyday life, some authors, like Smith (2014) emphasize that the mobile payments would be "the next big thing" in payment industry. On the other hand, public was introduced with the new concept of electronic money known as cryptocurrencies. It is the class of electronic money which provides its authenticity with cryptography techniques and which functions as the network of equal users, without central institution of the system.

Mentioned innovations allowed payments in the situations of absence of physical contact between payer and payee, so called card-not-present transactions (CNP). The mobile payments and cryptocurrencies represent the directions in which the payment operations will evolve in the following years. At the same time, in developed economies there is a professional discussion about the role of cash in modern society. A certain number of authors and regulators think that cash has diminishing importance in economic activities, so there are suggestions about its withdrawal. On that occasion, the restrictions of cash are highlighted but full attention to potential problems that might arise was not paid.

Issues which could arise during the transformation of the modern society into non-cash economy are the subject of this paper. The goal is to point out the dangers for users' private data and financial fund which will undoubtedly occur during the transformation. In the first part of the paper, the idea of cash elimination is explained and positive aspects of this plan are specified. In the second part of the paper, privacy issues of systematic compromising which could arise are addressed. In the third part, potential restrictions on cash elimination process are pointed out.

POSITIVE ASPECTS OF TRANSITION TO NON-CASH PAYMENTS

Starting from the barter, physical existence is distinctive for all forms of money. Human society is facing a major challenge in the moment when certain interested groups suggest abandonment of physical form of money and complete transition to money in form of electronic document. However, this is not the first revolution of payment system that human kind is facing to. Cash

differs from previous forms because its value does not rely on the physical value of material it was made of. In other words, paper used for printing cash values less than nominal value of banknotes. Its value is therefore assigned or prescribed by the country that issued it (Shubik, 1971, p 243).

The role of payment system has been crucial for economic growth since the early phase of civilization development. Revolutionary economic developments were always followed by radical changes in payment system. The rigidity of payment system seemed to be in the certain situations a brake on economic development. By the end of 17th century, countries had been gradually introducing the paper money, which allowed them faster commerce and flexible management of public finance. Paper money gave stimulus to the bank activity, which enabled higher rates of economic growth. From today's point of view, the use of paper money gave the key contribution to economic growth and modern society development, because it met modified business need in the best possible way.

The process of paper money introduction was marked with distrust and failure. After occupation of Persia, Mongol authorities tried to impose paper money, which they had found in China, but they did not have success. Population refused to use the paper by that extent that bazaars became deserted and trade died out. In the end, the government had to abandon that idea. The first issue of paper money in France, on the beginning of 18th century ended with the bank downfall because it printed money without equivalent in gold reserves (Weatherfor, 1997, p 131).

From previously said, it could be concluded that human society today is in the situation similar to that during cash introduction. Electronic trade records the high rates of growth globally, and these rates are much higher than the rates of economic growth. Developing countries have the important role in this growth, so their share in global electronic trade is higher than in traditional trade. There are more and more products and services which do not have physical form, or whose physical delivery is too slow in comparison to the moment of shopping. Electronic payments are unique which in these situations do not create any kind of constraints. Performed transactions have to be confirmed at the moment, while it depends on the system design itself whether fund transfer from the payer account to the payee account happens immediately or after. The speed of fund transfer is not the only advantage of electronic payments over cash payments.

Physical form of cash causes the exposure to risk of loss, but also to stealing and decline in the case of criminal activities (Vuksanović, 2009, p 26). Because of that, users avoid to carry unnecessary cash amounts. Electronic payments eliminate the danger of damage and fraying to which cash is subjected. Due to the frequent owner change, cash is thought to be hygienically dangerous. Great amounts of cash are difficult and expensive to transfer from one place to another due to the need of physical transport and security. Thus, cash is especially ineligible for transactions of high amounts.

Still, the biggest benefits from complete elimination of cash would be reflected in the suppression of the illegal activities. Almost every criminal activity, including drug trafficking, prostitution and terrorism financing, is based on the cash as a mean of payment (Tomić, Todorović & Jaksić, 2017, p 246). Non-cash payments leave written track which is possible to monitor and on which evidence could be based. Also, non-cash payments disable tax evasion through fictitious presentation of business activity reduced volume, because every transaction is automatically recorded. It could be concluded that countries' efforts to eliminate different forms of illegal cash use is the key motive for its elimination.

Restrictions on disposal and possession of cash already exist in many developed countries. In USA, client could not deposit or withdraw large amount of money from the bank without specific procedures. In the particular European countries restrictions are even more rigorous, because all cash transactions, not just those in banks, are subjected to the limits which constantly decrease.

In Greece, the limit is 1500 EUR, in France 3000 EUR, and in Finland the seller has no obligation to accept the cash if he has provided possibility for electronic payment. In Denmark, the buyer has to report every transaction made in cash that values more than 1340 EUR. Otherwise, he/she shares the responsibility with the seller if the seller does not pay value-added tax (Limit for cash payments in EU). The announcements that the similar limitation could be introduced in Germany, led to the major public rebellion (Campabell, 2018). Even cash possession within the limits could attract the attention of authorities, so citizens avoid to make substantial payments in cash. While houses and cars could not be bought with cash, more and more people in Western Europe avoid payments for electronics and furniture with cash. Aggressive cash limitation method is withdrawal of big denotations, in which European countries also lead. European Central Bank plans gradual withdrawal of 500 EUR notes, while in Great Britain only organizational units of Central bank in Scotland and Northern Ireland issue notes of 100 Pounds. Organizational unit of Central bank in England issues notes of maximal denomination of 50 pounds.

There are several alternatives to cash payments. On the one hand, non-cash component of existing payment structure could be seen as obligatory for all participants. On the other hand, countries could determine to issue their own electronic money. In both cases, the great challenge would be the need for creation of appropriate infrastructure for all participants. If the country decide to issue its own electronic money, it could directly control all transaction flows, but with existing infrastructure, it does that indirectly, via banks.

Large number of countries try to reform their own payment systems. Singapore (Chanjaroen & Roman, 2016), Germany (Thiele, 2017) and Canada (Fung, Hendry & Webber, 2017) consider the possibility for testing certain forms of electronic money. On the beginning, national electronic money would not completely replace the paper money, but the project success would eventually lead to that in the next phase. In the cash elimination process, the Scandinavian countries went the furthest, with an extremely low rate of cash usage in transactions. It is expected that Sweden will legally abandon the use of cash till 2023, although even now big number of products and services could be bought exclusively electronically (Leary & Gohd, 2017).

PRIVACY ISSUES AND LOSS OF CIVIL LIBERTIES

The key motive of cash elimination represents at the same time the greatest potential danger of this project. The raised level of monitoring, besides illegal activities prevention, could be used for direct control of population and economy. After numerous affairs which have showed that personal data in era of digital business is not secured, the public attention has been more and more drawn to the loss of privacy. Numerous electronic devices such as different forms of computers and mobile phones, as well as communication networks such as Internet, GSM and GPS generate mass data which could be misused. With its intense analysis, not only that movement and communication of the user could be traced, but also his/her interests and needs could be determined. In that context, incentives for complete transfer to electronic payments and cash elimination do not seem as a step forward on the technical progress path, but opens new safety questions.

Western countries lead by USA already used the excuse of fighting against terrorism to increase control over communication flows. It was noticed that governments, in cooperation with technological companies, unduly and illegally monitored population communication, and made extensive databases (Greenwald & MacAskill, 2013). The problem is that countries which dominated in electronic monitoring of their citizens, represent, judging by their own claims, the bastion of democracy and liberalism. In the beginning of 2018 it was disclosed that Facebook had been selling data about its users to analytical company Cambridge Analytica (Hern, 2018).

In other words, social networks make psychological profiles of the users and based on those conclusions they suggest them paid commercial contents. It should be added that large numbers of users communicate just via mobile phone, which by default have GPS modules on, that monitor the change of their location. Technological companies, hence, could know not just the tendencies of the user but also on which location he/she is prone to which tendency.

If all payment transactions in the future will be non-cash, the state will have insight into whole private life of the citizen. With insight in the performed transactions and communication, the state, not only knows what the individual would have for dinner, but also who would be present on the dinner. This opens the possibility for developing totalitarian forms of control even in democratic societies. Citizens would be found in uncomfortable situations when their funds are unavailable because of their political orientation, civil activism or the contact with persons who are labelled as unsuitable. Even so, fund blockage does not need to be emphasized anywhere, and the whole process can be hidden behind “system momentarily unavailability” or “work on the system” messages. The state can send clear message to the disloyal individual by leaving them without liquid funds for one or more days. The same form could be applied to the companies, where the ones with strong lobby can systematically sabotage competition. This creates the circumstances for sophisticated corruption and misuse, although the whole system is generally designed to avoid these activities.

Besides complete control over the citizens, the biggest organizational problem of electronic payment network would be payment security. It is well known that in CNP transactions there is no absolute certainty in user identity. Different approaches to the question of identifying the payer are mostly reduced to the two-factor authentication, as the most certain among currently possible solutions. This method combines approaches “of something that user knows” (username, password, PIN) and “something that user owns” (the device which provides the second factor for the user, which could be a token for generating authorization number or pre-registered phone number to which authorization number is sent). The fact is that even two factor authentication does not provide the complete security in user identity, but it makes committing of the fraud more difficult. In order to increase reliability, numerous payment institutions and technological companies work on the development of biometrical method for authentication.

The Apple was the first to implement the payment authentication with fingerprint in its mobile digital wallet Apple Pay (Tomić, 2016, p 144). Since the mobile phone is primarily the personal device, this solution have a sense because it allows only to the phone owner who verified his/her fingerprint to confirm payment. The disadvantage is impossibility for lending payment application to friends or family members, because they cannot authenticate payment. The certain authors suggest that instead of fingerprint it should be used iris scan, which also has the unique results for every person. Lomas (2016) pointed out that MasterCard had connected popular trend of making selfies by mobile phones with authentication in the process unofficially called selfie-pay, with which the payment is confirmed when the payer photographs himself/herself with the front mobile camera. However, this type of authentication could meet significant restrictions with the improvement of software for machine learning on the field of recognizing the photographs. The social network Facebook uses Deep Face algorithm, which is able to make extremely precise, so called facial model, regardless of the photo quality, context or illumination (Brdar, 2018, p 45). Algorithm is used for finding persons on future photographs, but it is evident that its application could be far more serious when it comes to the privacy.

The key question is whether all methods of biometrical authentication listed increase safety. If there is a question of preventing fraud, they will certainly contribute to harder commission of frauds. However, the price for sacrificed privacy could be too big. Users would be forced to give voluntarily great amount of data about their personalities, including great amount of biological

data, to the state or private entity. All forms of monitoring, control and blocking then become much simpler and almost impossible to circumvent.

Cryptocurrencies have so far showed distinctive value instability, so therefore they are not suitable as a mean of payment. However, in the wide public there is an opinion that payments with cryptocurrencies are anonymous and that it is impossible to track them, which is not entirely true. In order to avoid misuse of double spending, the users' network manages overall report of all performed transactions (activity log). Since it is the type of accounting system function, Dinić (2014, p 112) calls it "main ledger". Within the reports there are records of the transaction performing moment, amount, as well as numbers of virtual account of payer and payee. So, cryptocurrencies transactions are recorded and visible, although participants are not publicly identified. Consequently, the absolute payment anonymity disappears. Based on the intense analysis, it is possible to identify individuals included in certain transactions, and then to identify the whole network of his/her partners. Therefore, cryptocurrencies are more vulnerable in terms of privacy and anonymity in comparison to cash.

POSSIBLE RESTRICTIONS OF NON-CASH PAYMENTS

There is wide range of instruments and payment methods which allows cash usage avoidance. Older non-cash instruments such as cheques and payment cards become associated with different forms of electronic payment systems in the last two decades. The biggest number of them is specialized for performing transactions via Internet, and some like mobile digital wallets could be used in retail as well. Besides, many banks have developed their own payment applications for money transferring, which are often used for the typical bill payment. Cash shows exceptional superiority over non-cash payments in the situations when payee is not included in the system which enables payment to be performed differently – in other words, when user does not have open transaction account.

No matter if countries decide for existing non-cash mechanisms or for creation of their own electronic money systems, construction of necessary infrastructure will be big challenge. It is necessary to perform complete withdrawal of all cash from the use simultaneously with creation of technical conditions that enable citizen to receive adequate amount of deposit money (or electronic money). Emergence of the problem during this process could be influenced by the degree of population informatics' literacy, network of bank branches and ATM's, Internet signal coverage, number of mobile phones and computers per capita. It is evident that values of all parameters is lower in developing countries, so they could expect bigger problems.

On the beginning, it is necessary to open current accounts to all individuals who have the certain amount of money for exchange. The question rises in which banks these accounts would be opened and whether it would be free of charge. By choosing one bank or smaller number of banks, that group would be taken to the more favorable position in comparison to the rest of the market, because their customer base would increase. If the opening and/or maintaining of the account is not free, citizens will not receive in deposit form the amount equal to the cash they have handed over. Moreover, this raises legal questions of personal property violations. Density of bank branches and terminals could be one of the problems. In most of the countries, density of branches and terminals do not match population density, because in rural areas which can have numerous population, banking infrastructure is a lot smaller than in city centers. This situation is for instance in numerous countries of Central and Eastern Asia. Even if money transfer is performed without difficulties, problem of its disposal rises. In countries where a big share of population does not own computers and smart mobile phones, electronic and mobile banking services would be out of their reach. Poor internet signal in rural areas would disable entrance to the bank web site, work stoppage, and once again the inability for funds disposal. In

rest of the centers in which internet is available, bank sites would be overloaded, with partial or complete blockage of some functions.

Computer illiterate population would seek to make a conversion in deposit money the later as possible, which would definitely lead to the crowd in the last days of the deadline and extension of the term. One part of funds would be lost because a part of citizens do not make a conversion on time, which would expose them to poverty. Another part of citizens would refuse to exchange money and they would respond with total consumption and creation of product supplies. The result would be temporary scarcity of certain products, black market and smuggling. In rural areas, population would resort to swap in order to respond to cash elimination. As a consequence of bank and developers companies aspirations to make profits from this situation, commissions in payment applications would suddenly increase, destimulating individuals to pay electronically further.

The cash elimination does not have direct influence on the population only, but on economy sector as well. All companies would be obliged to introduce POS terminals for paying. Those which have done that earlier would have to obtain new terminals suitable for mobile phone payments or for cards with stored value (SVC).

Previously mentioned problems are not just thesis, but consequences of an existing project for popularization of non-cash payments. Government in India tried to repress cash from use with imposing non-cash payments for every form of state income to citizenship. Although program were followed by assigning of free payment accounts to the poor, numerous listed issues arose and they led to the slowdown in economic activity instead to digitalization and society modernization. To individuals with the same names and surnames, financial data were often duplicated, and during one power outage the state lost data for 300 000 of users. Above all, the Supreme Court of India forbade the state to abolish income to those who were not the part of non-cash program, and after that it ruled that privacy was citizens' constitutional right which mustn't be alienated (Brdar, 2017, p 43). This epilogue to the story shows that besides privacy problems there are also organizational, technological and legal restrictions, and that violent intrusion of non-cash economics is not the solution.

CONCLUSION

It could be concluded that human society today is in the situation similar to that one during cash introduction. Although there is undeniable need for constant progress of electronic mechanism for fund transaction, the question whether conditions for cash elimination are met rises. If states decide on this step, there is a high probability that before quality leap in digitalization societies will endure a series of earthquakes like the ones that were recorded during cash introduction. In order to some essential innovation of business manner succeed, it is necessary to be economically efficient, technically possible and legally satisfied. Since it is a change of basic economic postulate which is present for more than three centuries, it is necessary to exist the will of all economic factors. In contrary, instead of potential advantages which are sought to be exploited, the society could face the destruction of existing institutions without founding new ones which would be a proper replacement. Instead of prosperity, economics would experience stagnation, and society would experience anarchy.

Provision of state with such a powerful and controlling tool over the overall fund, inevitably leads to misuse by the state itself. In the times when information is the greatest value and source of power, control over all personal and financial information represents absolute power. If cash is abandoned, every possibility for independent and anonymous disposal of own money will disappear. There will be never again introduced a payment so well established, anonymous and easy to use such as cash is now. Besides the support of tradition, legal order and public opinion

which money has, it is clear that, once the cash is abandoned, everything will be subjected to termination eventually.

Elimination of cash would open other questions which were not analyzed in this paper. Those are the questions of influence on acceleration or slowdown of the economic growth in medium and long term, and on inflation and interest rates. Would the transaction accounts practically become saving accounts with negative interest rate and would interest rates in economy experience a long term decline? Unpredictability of the effects to real economy sector proves the need for innovation to be planned and as slower as possible, so that economic subjects could adjust to the emerging changes.

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DOMINANT MACROECONOMIC PARADIGM IN THE AFTERMATH OF THE CRISIS: LESSONS AND PERSPECTIVES

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Abstract: *In the last two decades, macroeconomic theory and policy is often presented in the framework known as the New Consensus Macroeconomics (hereafter NCM). The consensus emerged in the late nineties as an attempt to make a synthesis of leading economic approaches, such as Keynesianism, Monetarism, New Classical School and New Keynesianism. There is a great extent of consent among economists that this consensus became dominant macroeconomic paradigm, determining economic policy currents in numerous countries. Grounded on microeconomic models of economic agents' behavior, such as rational expectations and intertemporal optimization models, the model of NCM represented one of the most significant ways of simulation how national economy functioning.*

The paradigm had its support in favorable economic conditions, especially in developed countries. However, the period of prolonged economic stability, so-called Great Moderation, came to its end on the eve of the financial crisis in 2007. The economic crisis which emerged one year later expanded globally and became known as the Great Recession.

Bearing in mind that the crisis emerged in financial sector, the selection of financial variables that should be incorporated in the NCM model became a key challenge. Preventing of over-liquidity of the economy and adequate control of interest rates became highly important as well. In line with that, this paper discusses the biggest problems the NCM model was faced with during and after the crisis. In domain of economic policy, the paper deals with a critical evaluation of inflation targeting as the monetary policy regime and the implementation of fiscal rules in the field of fiscal policy. The key findings indicate that the price stability is not enough to prevent the economic downturn and that discretionary fiscal policy has its crucial role in times of crisis. Also, the results of theoretical analysis support the implementation of so-called macroprudential policy as well. Its main purpose is to ensure that every economic agent takes a cautious approach to risks that could become systemic and spread out to the whole financial sphere.

The main conclusions of the paper could be summarized as follows. The model of NCM should not be rejected, but it needs some important improvements. The upgrading of the model could be done by introducing the missing variables and equations which will cover functioning of financial markets and financial intermediaries. The Keynesian-type discretionary fiscal policy should not be used exclusively in time of economic disorders. Instead, the combination of discretionary fiscal policy and fiscal rules should be implemented in order to ensure both economic and fiscal stability. Finally, the NCM model should evolve in such a manner to be able to represent the functioning of both developing and transition economies, not exclusively the developed ones.

Keywords: *New Consensus Macroeconomics, Great Recession, New Keynesianism, Economic policy, Inflation targeting, Macroprudential policy*

JEL Classification: *B22, E44, E52, E62*

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INTRODUCTION

Development of economic theory in 20th century, particularly in the field of macroeconomics, has been characterized by numerous oscillations, revolutions and counterrevolution. Numerous economic schools of thought have been emerged, with different theoretical elements as their “trademarks”. Demand management and economic policy dedicated to achievement of the full employment was a legacy of Keynesianism. Adaptive expectations and rules in monetary policy, as well as the natural rate of unemployment, was a distinctive characteristic of Monetarism. New classical school introduced the rational expectations hypothesis and popularized the minimalist role of the state with its implications for monetary and fiscal policy. New Keynesianism was based on the assumptions about monopolistic competition and different kinds of real and nominal rigidities in the labor and goods markets.

Among all mentioned theoretical elements, there were some with a potential to become a part of the solid fond of economic knowledge, fulfilling the conditions for building so-called mainstream economics. New Consensus Macroeconomics (hereafter NCM), also known as the New Neoclassical Synthesis, emerged two decades ago and has become the dominant macroeconomic paradigm. The elements which constituted the NCM model were the rational expectations hypothesis, the principle of intertemporal optimization, the monopolistic competition assumption and the introduction of real and nominal price and wage rigidities (Snowdon, Vane, 2005, p. 411).

Bearing in mind the structure of the NCM model, as well as the tendencies embodied in the Great Recession which challenged the validity of the model, in this paper is presented the evaluation of the dominant theoretical model and its recommendations for economic policy. After presentation of the core characteristics of the NCM model, in the second section are presented the consequences of the crisis for both the world economy and dominant theoretical paradigm. Finally, the last section consists of the concluding remarks about main lessons and possibilities for further development of economic theory.

ESSENTIAL FEATURES OF THE PRE-CRISIS NEW CONSENSUS MACROECONOMICS MODEL

NCM model emerged as an attempt to link macroeconomics with its microeconomic foundations, combining the general equilibrium model with Keynesian assumptions. The name itself is first mentioned in the article of Marvin Goodfriend and Roberd King (1997) as “New Neoclassical Synthesis”.

The consensus relies on a common vision of neoclassical and (New) Keynesian theory, with separate roles in the construction of the macroeconomic model. The Real Business Cycles theory (RBC) explains and simulates the movement of potential output over time, using the Dynamic Stochastic General Equilibrium model. On the other hand, the rigidity of prices and wages, as one of the key elements of the New Keynesian literature, is seen as the main cause of short-run deviations of the real output from its long-run (potential) level. As with the model of RBC, in model of new consensus significant attention is paid to real shocks (on the supply side) as drivers of short-run economic fluctuations. However, in the NCM model, these fluctuations are not seen as effective and desirable, nor monetary policy is considered ineffective. The presence of the time lags in price and wage adjustment results in the real effects of economic disorders, so the application of an active economic policy can contribute to reduction of economic fluctuations.

One of the basic assumptions in the NCM model is the existence of imperfect (monopolistic) competition. Such a starting point is in line with the understanding that monetary policy affects real variables, and that an increase in output leads to the higher welfare. However, monopolistic competition does not by itself lead to monetary non-neutrality, but its combination with other

market constraints, such as nominal rigidities of prices and wages. In fact, market rigidity is of key importance in order to explain the formation of equilibrium below the optimal level. Slow adjustment of prices is the result of the firms' reaction, which, in an effort to maximize profit, make a decision on the most acceptable volume of output and price level (Marjanović, Mihajlović, 2011, 104).

The basic elements of the NCM model also define the approach to monetary policy, which is given priority in relation to fiscal policy. Emphasis is placed on rules rather than discretion, as well as the importance of credibility and the time consistency of the policy. By controlling the short-term interest rate, as the monetary policy instrument, central bank affects economic activity in order to achieve price stability as its primary objective.

The monetary policy transmission mechanism operates largely through the interest rate channel, the asset price channel, the exchange rate channel, and the credit channel. Their common characteristic is that they act on aggregate demand. The initial impulse, in the form of a change in the interest rate of the central bank, is transferred to the following variables (causing their change): nominal market interest rates (i), real interest rates (r) (at expected inflation rate), different components of aggregate demand (consumption C and investment I), production (Y) and unemployment (U), the size of the actual output and the size of the output gap ($y - \bar{y}$) and the inflation rate (π). Also, expectations are a significant factor in the functioning of the aggregate demand channel, so that one can speak of the inflationary expectations channel. The mechanism of transferring changes at the nominal interest rate through these two channels can be presented as follows (Fontana, 2009, 9-10):

$$\Delta i \Rightarrow \Delta r \Rightarrow \Delta C, \Delta I \Rightarrow \Delta AD \Rightarrow \Delta Y, \Delta U \Rightarrow \Delta(y - \bar{y}) \Rightarrow \Delta \pi \quad (1)$$

$$\Delta i \Rightarrow \Delta(\pi - \pi^T) \Rightarrow \Delta E_t(\pi_{t+1}), \quad (2)$$

where π and π^T denote actual and targeted inflation rate, respectively.

Aggregate demand channel (1) operates due to the short run rigidities in goods and labor markets as well as through the dynamics of expectation formation in relation (2), which enhance its impact. This ensures that the central bank, by changes of the nominal interest rate in the current period (i_t), affects the real interest rate at the current expectations of the future inflation rate: $i_t - E_t(\pi_{t+1})$.

The monetary policy regime in the NCM model is based on the inflation targeting, directed to achieving price stability. This regime is applied also for the purpose of suppressing the problem of time inconsistency, which often follows the conducting of monetary policy. The central bank follows the monetary rule by adjusting the interest rate as reaction to deviations of targeted variables from its targeted values.

On the other hand, fiscal policy is of minor importance in the NCM model, because of the belief that in its implementation on discretionary basis, the so-called "deficit bias" problem appears, leading to greater economic instability. Therefore, in the pre-crisis model of NCM, the use of automatic stabilizers, as well as various variants of fiscal rules, is prevalent.

GREAT RECESSION AND THE CRISIS OF THE ECONOMIC THEORY

The emergence of the US financial crisis, which spread to the rest of the world and led to the Great Recession in 2008, revealed the key "weak points" of the NCM model. Soon it became clear that its main drawback was in the assumption that cyclical fluctuations and crises are caused only by aggregate demand and supply shocks, rather than financial market disturbances. Initiated by the mortgage market bubbles bursting, the crisis has resulted in a sharp fall in real estate prices in early 2007, after nearly a decade of steady growth. This growth was the result of excessive

liquidity and housing policy of the US government (Horwitz, 2010, 102-103). Overly accommodative monetary policy in the US, combined with financial innovation has led to excessive liquidity. As a result, there was credit expansion and the creation of price bubbles (Arestis, Karakitsos, 2013, 51). Focusing on the stabilization of the inflation rate at the target rate, central banks ignored the fact that expansive monetary policy can lead to an excessive increase in asset prices.

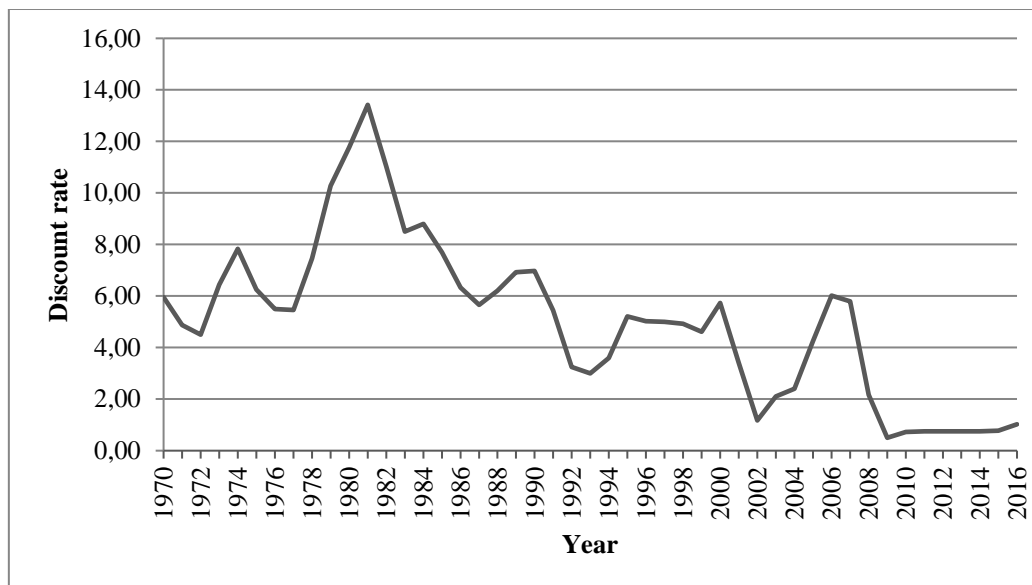


Figure 1: Discount rates in USA in period 1970-2016.

Source: own presentation, based on: <https://fred.stlouisfed.org/series/INTDSRUSM193N#0> (05.08.2018.)

As can be seen from Figure 1, in the US, the discount rate of the Federal Reserve Board over the past three decades had a constant decline. This rate was significantly reduced after each recession, in order to stimulate economic activity and accelerate recovery. For example, after the Asian Financial Crisis (1997-1998), the discount rate was reduced from about 6% to 1% (Karakitsos, 2008, 91). The Fed responded in a similar way to the emergence of the financial crisis in 2007, when this rate was even more drastically reduced to 0.75%, and that level was maintained by 2015.

So, over the years that preceded the crisis, monetary policy in the United States was not sufficiently restrictive, which is the attitude of a significant number of mainstream economists. For example, as John Taylor points out, monetary policy is not governed by Taylor's rule, especially in the period 2002-2005. Bearing in mind the movements of inflation and output in the period, more expansive measures were applied than objectively needed (Taylor, 2007, 5). In combination with inadequate regulation in the financial market, these tendencies have led to an increase in instability. Since the NCM model did not include the relevant parameters of the financial market, the negative currents haven't being detected in time. Also, the occurrence of financial instability was not due to monetary instability, as predicted by the traditional theory (Mazzocchi, 2013, 4). In other words, real circumstances have shown that financial instability can occur under the conditions of a low and stable inflation rate.

After the Great Recession, a monetary policy based on inflation targeting has become a subject of critics, with different views on its success and potential impact on the crisis occurrence. Some economists believe that monetary policy in the inflation targeting regime has caused the creation of bubbles in the real estate market, since the interest rate has been too long maintained at too low level. On the other hand, some of the well-known economists consider that monetary policy has succeeded in achieving price stability and stabilizing short-run inflation expectations, but

that monetary policy need to be adjusted to the new circumstances. Thus, Michael Woodford points out that it is necessary that a central bank that targets a given inflation rate should also take care of financial stability, especially if it affects the expected inflation rate (Woodford, 2012, 2). This is especially due to the fact that financial crises are unpredictable, so it is difficult to notice the creation of bubbles on the market until their "bursting" occurs. Instead of monitoring the movement of asset prices, the central bank should focus on monitoring the level of financial leverage and maturity transformation in the financial sector. In this case, the impact of the interest rate as an instrument of monetary policy increases, since even minor changes in short-term rates can significantly affect the willingness of the firms to establish a high level of leverage or rely on short-term sources of financing (Woodford, 2012, 5).

The economic crisis has also led to the "crisis" of the dominant macroeconomic model. At the same time, the interest of the expert and scientific public has increased for alternative explanations of the events that occurred, encouraged by the fact that among the representatives of heterodox theories were those who pointed to the possibility of a crisis (Galbraith, 2009, 85-97). For example, Austrian theory has seen the source of the crisis in the causal link between too accommodative monetary policy, on the one hand, and excessive financial leverage, insufficient savings and unsustainable asset prices, on the other hand (Tempelman, 2010, 10). Post-Keynesians believe that the crisis has not provoked by excessive expansionary policies and overliquidity, but it is a result of the process of financialization of both U.S. and the global economy, as well as the absence of adequate financial regulation. Among the post-Keynesian theories, the greatest interest was triggered by the hypothesis of financial instability, developed by Hyman Minsky (Minsky, 1992). The essence of the hypothesis is reflected in the view that modern economies are characterized by the existence of the so-called "Wall Street capitalism", in the center of which are finances, rather than money in the wider or broader sense. Capitalist economies are inherently unstable, and the key causes of the crisis arise during the period of stability (King, 2008, 147-148). Relying on this vision of financial capitalism, Minsky advocated the application of more detailed supervision and regulation of financial institutions, with the aim of preventing speculative activities. Also, similar to other Post-Keynesians, he recommended the introduction of short-term employment guarantee, i.e. the role of government as the "last instance employer", as the only way to reduce the involuntary unemployment and reduce inequality and poverty (Wray, 2008, 8). In addition, he advocated the importance of a countercyclical fiscal policy, as this can effectively mitigate the recession, as well as reduce inflationary pressures in the period of economic expansion.

The emergence of the financial and economic crisis unambiguously demonstrated that the key shortcoming of the NCM model lies in the wrong treatment of the financial sector. In the pre-crisis version of the model, it was assumed that financial market constraints only increase the impact of disruptions arising from other sources, and that the introduction of financial parameters leads to more complexity of the model, but not to its better efficiency. As a consequence, some of valuable financial indicators, which could indicate that the crisis will occur, are excluded from analysis. In that sense, significant corrections and additions to existing models are required through the inclusion of new entities, such as financial intermediaries and the way in which they form their expectations.

MAIN LESSONS LEARNED FROM THE CRISIS FOR ECONOMIC THEORY AND POLICY

Bearing in mind the economic consequences of the Great Recession, as well as the response of the economic policy makers to the emergence of the crisis, certain lessons can be drawn regarding the necessary adjustment of the macroeconomic model and the way of conducting of the economic policy. According to most economists, the Great Recession is a result of regulatory

and supervisory failures combined with low real interest rates and a housing policy, rather than a result of bad monetary policy. Nevertheless, achieving price stability through the interest rates policy cannot ensure financial stability, but requires the application of a separate financial stability policy. Lessons after the crisis point to the conclusion that this policy is needed, while the "flexible inflation targeting regime ... remains the best-practice monetary policy before, during and after the financial crisis" (Svensson, 2011, 35). Therefore, the central bank should take into account financial stability, which leads to improvement of monetary policy efficiency.

The policy of financial stability is aimed at achieving and maintaining stability in the financial sector. Financial stability implies the ability of the financial system to ensure smooth flow of payments, efficient allocation of financial resources and efficient risk management. Under normal conditions, instruments for achieving financial stability include supervision by the competent institutions, regulations governing financial sector activities, and the creation of reports on the movement of leading indicators that can provide timely warnings of threats to financial stability (Svensson, 2011, 40).

Although there are contrary opinions, the prevailing one is that, even after the crisis, inflation targeting should remain the regime within which the central banks conduct monetary policy. However, access to monetary policy should be based on the interaction between its objectives and the objectives of the financial stability policy. Monetary policy affects the economy, asset prices and the balance of the company's balance sheets, and thus the financial stability. On the other hand, financial stability directly affects the yields, the volume of loans and other conditions of financial operations, as well as the transmission mechanism of monetary policy. In the case when financial stability is endangered and the liquidity is too high, the transmission mechanism can be weakened, especially when interest rates are very low. The ineffectiveness of monetary policy will have serious consequences if it occurs in a situation where there are negative tendencies in the real sector (Gerlach, 2013, 38).

Under the influence of the relationship between monetary and financial stability, increasing attention is paid to measures aimed at preserving stability in the financial market. These measures serve to prevent the occurrence of disorders in the financial and real sector and are included in the so-called "macroprudential policy". The main objective of this policy is to reduce the risks and macroeconomic costs of financial instability. Measures of macroprudential policy are focused on the financial system as a whole, while respecting the link between the financial and the real sector. Policy instruments are related to the monitoring of credit indebtedness, liquidity and capital positions, at micro and macro level.

As in the case of monetary and fiscal policies, the application of the macroprudential policy is based on the rules. They provide a more consistent and predictable policy. However, designing these rules that are flexible enough is not easy. In this case, policy makers can rely on discretion in order to maintain the policy course set. The necessary condition for the success of discretionary measures is clear communication with the public (Lim et al., 2011, 8-10). Also, coordination of macroprudential, monetary and fiscal policies is crucial, especially if there is a complementary relationship between their measures, as well as the consensus about the objectives of these policies.

The emergence of the Great Recession reaffirmed the importance of the active fiscal policy, which in the NCM model was a complement to monetary policy. However, in a situation of high liquidity and low interest rates, the power of monetary policy is considerably limited. Therefore, discretionary fiscal policy in the form of extensive public expenditure aimed at stimulating economic activity has been applied for preventing the consequences of the crisis in a large number of countries. This is in contrast to the approach to economic policy in the pre-crisis model of the NCM (Mihajlović, 2018, 268).

In this sense, the crisis has led to a change in the attitude about the role of fiscal and monetary policy. Discretionary fiscal policy remains the “ultimate solution” in conditions of a serious recession, while monetary policy is the most effective for short-term stabilization of the economy. In addition, fiscal stability is a requirement for the efficient application of monetary policy, and thus of better macroeconomic policy performance in general. When fiscal rules are in question, the solution to problems in their implementation has been found in the introduction of independent bodies, fiscal councils, whose activity should complement the functioning of fiscal rules. These institutions have an advisory role, but also the role of control of *ex post* deviations from *ex ante* set fiscal targets (Praščević, 2013, 49). Fiscal councils also analyze the long-term sustainability and optimality of the fiscal policy, as well as its transparency. The sustainability of fiscal policy is closely linked to the accuracy of the projected values of the relevant variables, given by the fiscal council.

CONCLUSION

The global financial crisis and the Great Recession highlighted the failures of the economic policy based on the theoretical framework of the New consensus macroeconomics. As pointed out in the paper, the key weaknesses of this policy are reflected in the understanding that financial sector constraints only amplify the effects of disruptions arising from other sources. In other words, it was assumed that tendencies in the financial system cannot be the cause of the crisis. On the basis of such a position, economic policy measures, aimed at achieving monetary stability and fiscal sustainability, have been formulated. The development of the events during and after the Great Recession drew the attention of the policy makers and the experts to the necessity of monitoring the flows in the financial sphere and pointed out the need to formulate measures for the improvement and preservation of financial stability. Therefore, it is clear that it is necessary for the NCM model to be supplemented by introducing financial indicators into fiscal and monetary policy rules. Such a modification of the economic policy model, complemented by the mechanisms of optimal coordination of monetary, fiscal and macroprudential policies, will certainly contribute to the improvement and greater efficiency of the dominant macroeconomic model.

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TRANSMISSION MECHANISM OF MONETARY POLICY IN SERBIA – SUPPORT FOR THE PRIVATE AND PUBLIC SECTOR?

Zenaida Šabotić¹, Ernad Kahrović²

Abstract: *It has been almost ten years since inflation targeting was introduced in Serbia as a monetary policy regime after a long period of high inflation, economic stagnation, high unemployment and structural underdevelopment. Under such conditions, there is no certainty of the success of any single monetary policy regime. There is no full agreement and clear evidence of the pronounced benefits of the monetary regime of targeted inflation against the rest, but this regime provides an additional incentive for the analysis and understanding of the transmission mechanism. The unstable and turbulent environment, as well as the internal problems of the countries in transition, put even more restrictions and challenges on the monetary policy makers in terms of the operation of the selected monetary policy instruments. On the one hand, for the successful realisation of economic objectives (inflation rate, unemployment rate, economic growth and development), a consistent monetary policy is needed, given the time lag of the effects of monetary measures; on the other hand, it is necessary to adapt to the changed requirements and market conditions. Especially in countries in transition, the action lag is emphasised, which is significantly shorter in the developed countries. Monetary policy is at center stage in discussions about how to promote sustainable growth and low inflation. Due to the large budget deficits of most developing countries, and due to suspicion of the ability of fiscal policy to achieve the desired stabilization results, the consensus of economists and politicians about the primary role of monetary policy in stabilizing production and inflation has been achieved. The paper will analyse the effects of the chosen monetary policy regime in Serbia, whose understanding requires a good knowledge of the transmission mechanism, through analysis of the level of inflation, unemployment, exchange rate variability, interest rate movements after the introduction of the targeted inflation regime in private and public sector. Although the effects of the monetary policy on real economic trends depend on the effects of other economic policies, primarily fiscal policy, the analysis will focus on the successful realisation of the defined inflationary target. The paper will present the basic theoretical settings of the target inflation regime, the transmission channels of monetary policy and the contribution and relevance on real sector in Serbia.*

Key words: *Monetary policy, Inflation targeting, Transmission mechanism, Key policy rate*

JEL Classification: *E58, G38, H60*

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INTRODUCTION

Periods of high inflation rates in most developing countries have imposed price stability as the long-term primary objective of monetary policy. Although the coordination of monetary and fiscal policy is necessary for the realization of economic goals, there is agreement among the economists and politicians about the more significant role of monetary policy in the realization of selected goals. Although the time lag of the effects of monetary and fiscal policy is similar (about 24 months), priority is given to monetary policy, because it is more independent in terms of achieving economic goals and less susceptible to changes due to large budget deficits. Therefore, it is not surprising that in recent years inflationary targeting has gained importance as a monetary policy regime, and that has been applied in a large number of countries. There is no monetary policy regime that would be equally effective in all the countries that apply it. It is therefore not surprising that in the previous period, the monetary authority in Serbia applied several different monetary policy regimes, which carried with them different primary goals and instruments for their realisation. The implementation of different regimes is due to the changing circumstances and factors in the domestic economy, as well as the situation in the world economy. Problems are particularly evident in underdeveloped, transit economies, although further use of this term is debatable. Nevertheless, in such economies, the inconsistency in defining the primary goals and the use of monetary policy instruments for their realisation may be a major problem in achieving the positive effects of using it. But given the fact that the application of monetary policy is conditioned by the state of the economy, which is constantly changing in the transit period, then its constant change is not surprising, as a result of the devaluation of the effects that should have been achieved.. The National Bank of Serbia (NBS) has been officially implementing the inflation targeting regime as its main monetary policy strategy since 2009. The key policy rate will be the main monetary policy instrument in the inflation targeting regime. Other monetary policy instruments, including interventions in the foreign exchange market, will only have supporting roles. Main channels of the monetary policy transmission mechanism are interest rate channel, exchange rate channel, asset price channel, with two credit channels: bank lending channel and balance-sheet channel. In developed market economies, the interest rate channel represents the most significant channel of the monetary policy transmission mechanism. In Serbia, its significance is still limited. Monetary policy affects net export through the impact of the interest rate on the exchange rate. Higher interest rates mean stronger currency, and stronger currency leads to a decline in net export demand and output, and vice versa. Interest rate changes also affect prices of imported goods and services leading to a direct price hike (with products that are exclusively or predominantly of imported origin) or indirect price hike (through the rise in costs of imported components in domestic products). This is a very important channel in Serbia. Monetary policy affects households and economy through the effect of the interest rate policy on the valuation of equities. Higher interest rates bring equity prices down. Lower equity values lead to a drop in financial wealth, and less wealth means less spending. Low value of equities relative to the replacement cost of capital results in reduced investment spending. When we talk about bank lending channel, it is particularly important in the countries where banks play a significant role in the financial system. As long as there is no perfect substitutability of economic entities' bank deposits with other sources of funds, the bank lending channel of monetary transmission stay a highly significant channel in Serbia. Interest rates affect balance sheets, cash flows and net worth of companies and consumers. Higher interest rates result in reduced cash flow, reduced net worth, drop in loans, and decline in aggregate demand, whereas adverse selection and moral hazard grow in significance. This paper will provide an overview of inflation target regime and his implementation in Serbia, as well as the transmission mechanism of monetary policy: the process through which monetary policy decisions are transmitted into changes in real GDP and inflation.

LITERATURE REVIEW

Targeting inflation is the "youngest" monetary policy regime, first applied in 1990 in New Zealand. However, as early as next year, Canada begins to apply this regime, in 1992, the United Kingdom, and in 1993 Sweden and Finland. Then, Australia and Spain (1994) went through the same regime, followed by Israel, Brazil and Chile, and today, according to IMF there are 28 countries that use inflation targeting, fixing the consumer price index as their monetary policy goal. Three other countries—Finland, the Slovak Republic, and Spain—adopted inflation targeting but abandoned it when they began to use the euro as their currency.

The Czech Republic was the first transition country to introduce it in 1997. The main elements of this regime are: the need to publicise a medium-term inflation target; the obligation to define price stability as a primary goal of monetary policy; full information about all the variables used in making decisions, and not only monetary aggregates; transparency of the monetary policy strategy and growth of the central bank's responsibility for achieving the primary goal. Misconceptions related to this monetary policy regime could be reduced to the following. First, as Mishkin (Mishkin, 2001) points out, inflation targeting is a framework for monetary policy, not a rule. Every monetary policy, if it seeks to be coherent and purposeful, is placed in some conceptual frameworks, and it is just the question of how much that concept is clearly defined. According to Bernanke (Bernanke, 2003) inflationary targeting provides a single, coherent framework for thinking about monetary policy choices, with the involvement of the public. If, in this context, monetary policy succeeds in achieving the goals of directing inflationary expectations, the achievement of the ultimate goals is significantly facilitated. Another misconception concerns the assumption that inflationary targeting is exclusively based on inflation control, ignoring the goals of growth and employment. And as the last misconception that Bernanke points out, it refers to the assumption that inflation targeting is not consistent with the central bank's commitment to maintaining financial stability (the US example). Mishkin (Mishkin, 1996) gives us an overview of the transmission mechanism of monetary policy and emphasizes four lessons from an understanding of the monetary transmission mechanism as follows. First, it is very dangerous to always associate monetary policy easing or tightening with a fall or rise in short-term nominal interest rate. Second, other asset price besides those on short-term debt instruments contain important information about the stance of monetary policy because they are important channels of the monetary policy transmission mechanism. Third, monetary policy can be highly effective in reviving a weak economy even if short-term interest rates are already near zero. And the last one, avoiding unanticipated fluctuations in the price level is an important objective of monetary policy, thus providing a rationale for price stability as the primary long-run goal for monetary policy. His later work confirming those lessons (Mishkin, 2007; Boivin et al. 2010; Cecioni and Neri 2010). Further explanations of how transmonetary mechanism works can be found in Alkin and La Cava (2017.)

METHODOLOGY

Having in mind commitment of monetary authority in Serbia of achieving the main goal, price stability, within inflation target regime, below will be discussed the relationship between inflation rate, GDP, key policy rate, having in mind other indicators using data from the National bank of Serbia. Time series analysis includes the period from 2005 to 2017, with more than 50 data related with central bank activity, commercial banks activities, macroeconomic indicators, and their relations and fluctuations within this period. We used univariate and multivariate linear regression analysis, correlation analysis, with the purpose to confirm relations between those indicators. Some of indicators that we used are real GDP growth rate (in %), consumer price, unemployment, key policy rate, discount rate, RSD/EUR exchange rate (average and end of period), dinar and indexed dinar savings-total, foreign currency savings-total, housing loans

(RSD, indexed to FX and FX loans), consumer loans (RSD, indexed to FX and FX loans), M1, M2, M3, foreign exchange reserves of commercial banks (EUR m), foreign exchange reserves of NBS (EUR m), etc. All data are analyzed using SPSS program, and results are presented in the next step.

RESULTS AND DISCUSSION

By using univariate linear regression model, we see the significant relationship between inflation rate, and key policy rate, which confirms the adequate choice of the main instrument of monetary policy.

Table 1. The Relationship between consumer prices and key policy rate in Serbia, from 2005-2017.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
	B	Std.Error	Beta			Lower Bound	Upper Bound
(Constant)	-0.116	2.534		-0.046	0.964	-5.763	5.531
Key policy rate	0.639	0.246	0.635	2.602	0.026	0.092	1.186

Source: Author's calculation according to NBS data

As it is shown in table 1, an increase of key policy rate for one pp leads to a significant increase in the inflation rate for 0.639 (0.092-1.186, $p=0.026<0.05$). The change of key policy rate explains 40.4% of the changes in consumer prices ($R^2 = 0.404$). Using the same analysis, with real GDP growth (in %) as dependent variable, and consumer prices (in %, relative to the same month a year earlier), there is no significant relation between those two variables ($sig=0.256>0.05$). Graph below shows relationship between monetary and real sector, presented through movements of these variables.

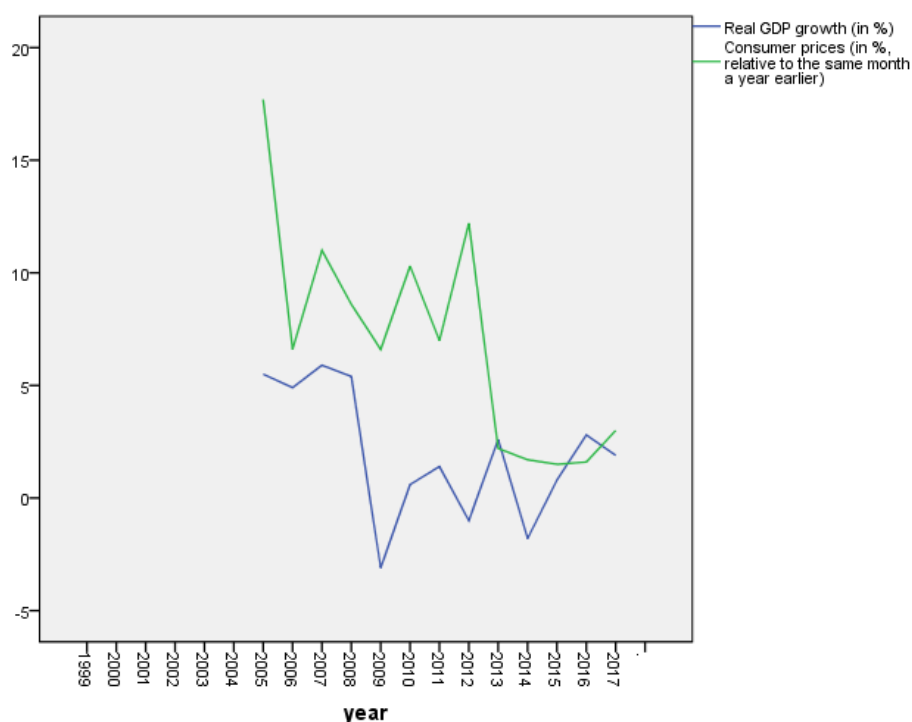


Figure 1: Relationship between consumer prices and real GDP growth rate (in %)

Source: Authors calculations according to NBS data

Relationship between consumer prices, and RSD/EUR exchange rate is evident, and shown on Figure 2 below. Every time when we had decrease of inflation rate, there is significant depreciation of exchange rate.

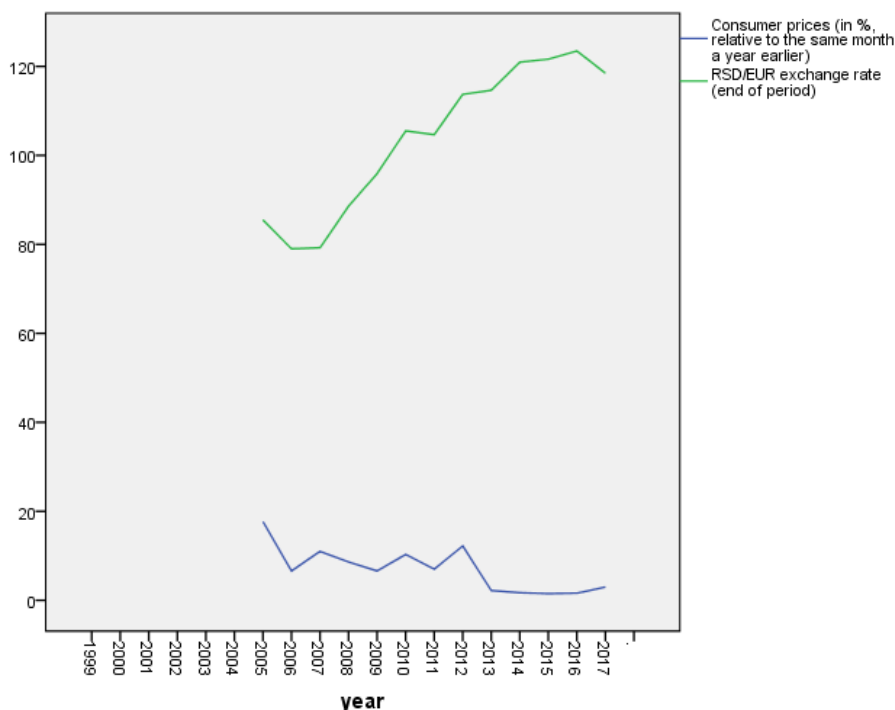


Figure 1: Relationship between consumer prices and RSD/EUR exchange rate

Source: Authors calculations according to NBS data

As it was mentioned earlier, there was no confirmation of significant relations between consumer prices and real GDP rate growth, but between RSD/EUR exchange rate and real GDP rate growth there is a significant relationship. An increase of RSD/EUR exchange rate for one unit of measurement leads to a significant decrease in the real GDP growth for 0.104 (0.010-0.198, $p=0.033<0.05$). The change of RSD/EUR exchange rate explains 35% of the changes in real GDP growth rate ($R^2 = 0.350$). The statistically significant correlation between the inflation rate and monetary aggregate M2 was confirmed, which supports the fact that monetary authorities can monitor the movement of this aggregate in order to achieve the target inflation rate. Due to the different presentation of these two variables, their standardized values are used. The univariate regression analysis shows that every increase of M2 for one standard deviation leads to a decrease of consumer prices for 1.038 standard deviations (0,495-1,580, $p=0.001<0.05$). The change of M2 explains 61,7% of the changes in consumer prices ($R^2 = 0.617$). Regarding the influence of the selected monetary policy instrument, the key interest rate on the movement of public debt, a statistically significant correlation was confirmed. An increase of key policy rate for one pp leads to a significant decrease in the RS public debt for 3.278 (1.261-5.295, $p=0.005<0.05$). The change of key policy rate explains 56.7 of the changes RS public debt ($R^2 = 0.567$). In the previous period the NBS continued to lower key policy rate (currently 3.00%) in order to stimulate investment activity, the public republic of Serbia records a significant increase. This is confirmed by the state of RS public debt in March 2018, with total external debt, in mil EUR from 25,445.1, within that amount, on public sector goes 13,766.2, on private sector goes 11,678.9, but on the enterprises most of that amount-9.307.7 (NBS, 2018). Offcourse, raising of key policy rate is connected to decreasing of all saving in Serbia (dinar and indexed dinar savings, as well as foreign currency savings, for 3,566.943 (2,010.465-5,123.422, $p=0.000<0.05$) and 57,308.640 (24,812.482-89,804.798, $p=.0.003<0.05$, respectively). An increase of key policy rate as a consequence has decreased in total housing loans, for 9,586.268

(4,042.793-15,129.743, $p=0.005<0.05$, $R^2=0.749$). But, when we talk about the influence of movement of key policy rate on consumer loans, indexes to FX an FX loans over 5 years, we can see different results. An increase of key policy rate for one pp leads to increase of consumer loans, indexes to FX an FX loans over 5 years for 2,334.684 (1,314.366-3,355.002, $p=0.001<0.05$, $R^2=0.839$). For consumer loans, RSD over 5 years there wasn't a statistically significant relationship with the movement of key policy rate ($p=0.111>0.05$). In the end, univariate regression analysis shows that there is a statistically significant correlation between key policy rate and total loans to households including NPISH and non-financial corporations. An increase of key policy rate for one pp leads to decrease of total loans to households including NPISH, and non-financial corporations for 48,339.038 (17,715.009-78,963.067, $p=0.008<0.05$, $R^2=0.713$).

CONCLUSION

The decision of the monetary authorities in Serbia to use the inflation targeting methods and key interest rate as the main instrument of monetary policy, based on the previous analysis, seems justified. However, there are the three key elements of inflation-forecast targeting: a quantitative inflation target, an inflation forecast that plays a central role in decision-making, and transparency and accountability. Central bankers must have clear objectives and sufficient capacity and independence to provide these key elements. Most countries that adopt inflation-forecast targeting do not have all these elements in place at the outset, but in almost all cases, their modeling and forecasting capability, transparency and policy communication, and exchange rate flexibility have improved over time. Successful inflation-forecast targeting also requires a change in mindset—policymakers must accept the notion that achieving low inflation is the primary objective of monetary policy (while minimizing the variability of movements in the real economy in the course of achieving and maintaining the target rate of inflation), that central bank instrument independence is of paramount importance, and that fiscal policy concerns cannot dominate monetary policy choices. Challenges faced by the Bank of Serbia, including a highly euroized economy (that is, the euro is widely used for transactions and savings) and high food and headline inflation volatility. In such circumstances, a strong and rapid policy response in response to shocks is needed to anchor inflation expectations. Also, macroprudential policy instruments are useful in complementing conventional monetary policy instruments, and if applied carefully, can improve the effectiveness and credibility of inflation-forecast targeting regimes.

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INCOME CONVERGENCE BETWEEN WESTERN BALKAN COUNTRIES AND EUROPEAN UNION

Sonja Milutinović¹, Danijela Durkalić²

Abstract: *This raise of the income level and the standard of living is one of the basic expectations of the European transition countries, which is why these countries have a strong interest in becoming full members of this intergovernmental and supranational union. European transition countries that have joined the European Union, have significantly increased their per capita income level. In the period from 1995 to 2016, New Member States increased per capita income from 20% to 36% of the EU15 average. In the same period Western Balkan transition countries increased per capita income from 4.3% to 12% of the EU15 average. A large number of previous studies tested and proved the existence of income convergence between the "old" and "new" European Union member states. However, there is still a small number of papers dealing with the income convergence hypothesis between the European Union member states and Western Balkan States. The paper tests the hypothesis whether the income level of Western Balkan States converges the income level of European Union member states. In order to test the hypothesis we will use two types of income convergence. The first is σ -convergence (sigma), which measures the dispersion of income between countries within the observed group. The second type is β -convergence (beta) which, using the regression equation, measures whether countries with a lower income level achieve faster growth than those with higher income levels. The observed period is from 1995 to 2016. The results of sigma convergence testing show that there is a trend of reducing per capita income dispersion between European Union member states and the Western Balkans States. However, this downward trend does not exist when we compare the Western Balkan States and EU15. Results also show the effects of Global economic crisis on income convergence. Namely, the coefficient of variation has increased in the period from 2008-2011, indicating divergence. The results of the regression analysis of beta convergence show the existence of income convergence for the entire observed period. Income convergence exists when we compared Western Balkan States and the European Union member states, when only European Union member states are considered, as well as when the Western Balkan States and EU15 are compared.*

Keywords: *Income convergence, Economic development, Economic integration, European Union, Western Balkan States*

JEL Classification: *F15, F43, O47, P27*

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INTRODUCTION

One of the key issues of research in the field of economic growth and development is the hypothesis of income convergence, or the debate about the catching up of countries of different development levels. The theoretical debate on the income convergence between countries began with the introduction of the neoclassical growth model by Robert Solow (1956). Namely, the concept of income convergence implies a reduction of income per capita gap of countries or regions. This refers to faster growth of poor countries in relation to rich countries, which is why income level in all countries is converging (Milutinović, 2015).

There are two concepts of income convergence: σ -convergence (*sigma*) and β -convergence (*beta*), where β -convergence can be absolute and conditional. Sigma convergence is defined as a decrease in income dispersion among countries over time and is calculated with the coefficient of variation. If the coefficient of variation decreases over time, sigma convergence exists (Barro & Sala-i-Martin, 2004). Conversely, if the coefficient of variation increases over time, there exists sigma income divergence.

Absolute beta convergence is a convergence towards similar income per capita in countries in the long run. Thus, absolute beta convergence implies a negative correlation between the income growth rate and the initial income per capita. On the other hand, relative beta convergence is convergence to the corresponding per capita income levels in countries. Relative beta convergence takes into account geographic, structural and socio-economic variables specific to the country, and therefore countries converge to their own, steady-state levels of income per capita (Barro & Sala-i-Martin, 2004).

The aim of this paper is testing the hypothesis whether the income level of Western Balkan States (WBS) converges the income level of European Union (EU) member states. In order to test the hypothesis, two types of income convergence will be tested (sigma and beta). The paper consists six parts. Introduction is followed with a review of literature. The third part presents the economic growth of the WBS in relation to the EU. In the fourth part, a methodology that will be used to test the hypothesis is put in place, followed by research results. The sixth part concludes.

LITERATURE REVIEW

The issue of income convergence has attracted numerous economists, which later produced a vast number of research in the 1980s. Income convergence was a topic of both theoretical and empirical research in macroeconomics, international economy, and the development economy (Kang, 2011). More recently, there is a vast number of research on the issue of income convergence among EU countries, which mostly confirm the existence of income convergence. The number of papers that tests income convergence between "old" and "new" EU countries has grown by expanding the EU with the countries of Central and Eastern Europe in 2004. In the numerous papers that followed, the results showed that New Member States (NMS) developed in accordance with the income convergence (Matkowski & Próchniak, 2004; Varblane & Vahter, 2005; Vojinović & Oplotnik, 2008; Vojinović, et al., 2009; Cavenaille & Dubois, 2010; Stanišić, 2012; Próchniak & Witkowski, 2013; Gligorić 2014).

Matkowski & Próchniak (2004) proved the existence of income convergence among Central and Eastern European countries (CEE), as well as between CEE8 and EU15 groups. Later studies by the same authors (Matkowski & Próchniak, 2007) and many others (Vojinović & Oplotnik, 2008; Vojinović, et al., 2009; Próchniak & Witkowski, 2013) confirmed income convergence between CEE8 and EU15, with slight differences in estimated speed of convergence. Stanišić (2012) tested the hypothesis of income convergence on the example of 25 EU countries in the period

from 1993 to 2010. The results showed the existence of sigma and beta income convergence (absolute and conditional). Author included last few years in analysis, and showed the effects of Global Economic Crisis on income convergence. Namely, the Crisis produced inverse results on income convergence in the CEE10 group and the group of developed EU countries (EU15). Since 2007, there has been income divergence in the first group of countries, while the second group of countries converged. Reducing the income gap between the NMS and the EU15 has also been demonstrated in the study by Gligorić (2014). Author concluded that income convergence started significantly before the countries joined the EU.

Although there is a vast number of papers on the topic of income convergence among EU countries, there is still a small number of papers dealing with the existence and speed of income convergence between European Union and Western Balkan States. One such study was conducted by El ouardighi & Somun-Kapetanovic (2009) on the example of five Balkan countries (Albania, Bosnia and Herzegovina, Croatia, Macedonia, and Serbia and Montenegro) and the EU countries from 1989 to 2008. The results show a tendency towards income convergence, and inequalities of the Balkan countries throughout the analyzed period. Results of the study by Tsanana et al. (2012) for the period from 1989 to 2009 indicate that income convergence exists only in the case of Slovenia and Greece, but not in the case of the WBS.

Differences in the speed of income convergence between the WBS and NMS group, on the one hand, and the developed EU countries, on the other hand, were examined in the study of International Monetary Fund (Murgasova et al., 2015). Authors confirmed the existence of income convergence between NMS and EU15, but poor income convergence between the WBS group and EU15. These results refer to the period from 2000 to 2007, that is, before the outbreak of the Global Economic Crisis. Observing the period after the outbreak of the Global Economic Crisis, the authors have proven that income convergence exists for the WBS group, but it was slower than that achieved by the NMS. Stanišić (2016) came to similar results when he tested the existence and speed of income convergence of WBS and NMS, compared with EU15. The results showed the existence of income convergence between WBS and EU15. However, the results also showed that this income convergence is interrupted by the outbreak of the Global Economic Crisis, with raising income gap between the WBS and the NMS.

ECONOMIC GROWTH OF THE WESTERN BALKAN STATES TOWARDS INTEGRATION IN THE EUROPEAN UNION

Economic integration is a process of cooperation among the countries in order to achieve the economic benefits, especially effective international flow of people, capital and products. Expected benefits are connected with the increase of welfare of the integrated countries. (Zdravković & Durkalić, 2017). The numerous advantages that economic integration brings are the reason why, the transition countries of the Western Balkans, as a strategic goal, has gaining full membership in the European Union. One of the basic expectations of European transitional countries is an increase in living standards, with catching up the per capita income level achieved in developed countries of the European Union. Since the beginning of the transition, it has been almost 30 years and many European transition countries have entered the European Union and significantly increased per capita income level. In the period from 1995 to 2016, NMS increased per capita income from 20% to 36% of the EU15 average. In contrast, the transition in the WBS did not produce such effects. In the same period, the per capita income of the Western Balkans relative to the EU15 average rose from 4.3% to 12%.

Figure 1 shows the average growth rates of GDP per capita in the period from 1995 to 2016 for the EU15, NMS and WBS divided into four subperiods: 1995-2000, 2001-2008, 2009-2016. In the first observed subperiod, the high average growth rate in the WBS group can be explained with very high growth rate of Bosnia and Herzegovina in the first years of recovery after the

fluctuations in the Western Balkans region, which disrupts the real, not so good, picture of WBS growth in this period. Namely, the beginning of the nineties was very turbulent for the Western Balkans. Many WBS have spent considerable part of the last decade of the twentieth century in war conflicts, that have led to the break-up of the state and the creation of new ones. These disruptions postponed the beginning of WBS transition reforms for the end of the XX and the beginning of XXI. The beginning of transition in CEE countries, although without war and conflict, was followed by a recession (Stanišić, 2016).

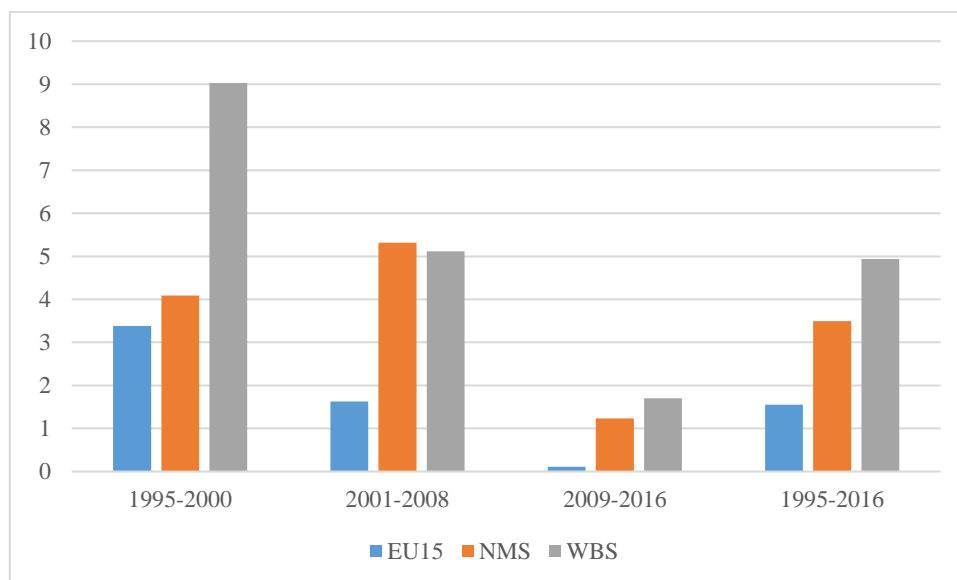


Figure 1: Average GDP per capita growth rates in EU15, NMS and WBS, in percentages
Source: The World Bank, author's calculation

The first decade of the 21st century brought a new momentum of economic growth to the transition countries, so the average growth rate of the NMS in the period from 2001 to 2008 was 5.32%. Significant growth was also achieved by the WBS group, with an average growth rate in the second observed subperiod of 5.12%. Both the NMS group and the WBS group recorded significantly higher average growth rates in this subperiod than the EU15, with an average growth rate of 1.63%. This speaks in favor of the fact that the WBS reduce the development gap between them and the EU15. However, this convergence is still slower compared to the NMS, which in this sub-period have yielded slightly higher average growth rates. However, this growth in the Western Balkan region is a consequence of tendencies in the global economy, deeper financial and trade integration with the rest of Europe, high capital inflows, rapid credit expansion and productivity growth, rather than real progress in economic reforms (Murgasova et al., 2015).

The third observed subperiod (2009-2016) shows the effects of the Global Economic Crisis. The most affected group is the group of the most developed countries of the European Union (EU15), which in this subperiod achieved an average growth of only 0.11%. In the most difficult situation were Portugal, Ireland, Italy, Greece and Spain, which were affected by internal and external debt, and high and rising unemployment (Savić & Mičić, 2015). The NMS group recovered the fastest from the of Crisis, with an average per capita GDP growth rate in this subperiod of 3.5%. In the post-crisis period, the WBS group had an even higher average growth rate of 4.94%. The higher average growth rate of the WBS group relative to the NMS can be explained by the significantly lower average growth rate of the NMS group in 2009, which was -6.82%, and 1.45% in WBS. Since 2011, the average WBS growth rates have been significantly lower than the NMS. These results indicate that the NMS were hit harder by the Crisis than WBS, and that NMS recovered much faster and thus gained a new momentum in achieving the average income

level of EU15. For the region of the Western Balkans, the years after the Crisis have brought the effects of bad reform processes and stagnation.

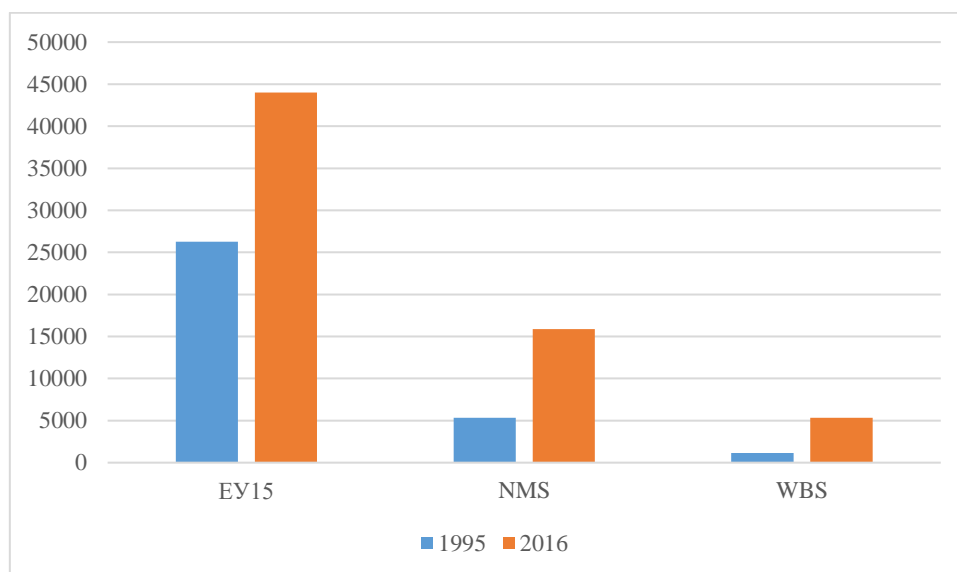


Figure 2: Average level of GDP per capita in the EU15, NMS and WBS from 1995 to 2016, in USD

Source: The World Bank, author's calculation

The average per capita GDP growth rate during the entire observed period (1995-2016) in the EU15 group was 1.55%, in the NMS group 3.5% and in the WBS group 4.94%. These average growth rates allowed the average GDP per capita to increase from 26,258 to 43,994 USD for the EU15, 5,324 to 15,880 USD for NMS and 1,137 to 5,325 USD for WBS (Figure 2). On the basis of the data presented in Figures 1 and 2, it can be concluded that developing countries reduce the income gap over time in relation to developed countries, e.g. converge. However, more concrete and precise conclusions can only be made after a detailed regression analysis that will be carried out in the next section.

RESEARCH METODOLOGY

The paper will examine the existence of both types of convergence, sigma and beta convergence. The paper uses data from the The Word Bank database. Sigma income convergence is calculated using the coefficient of variation, as follows:

$$CV = \text{standard deviation} / \text{arithmetic mean}$$

GDP per capita will be used as a measure of the dispersion of development among countries. If there is a trend of reducing the coefficient of variation of GDP per capita, income convergence exists. In other words, income convergence exists if the differences in income per capita is reduced over time.

In order to examine the existence of beta convergence, the following regression equation will be tested (Barro & Sala-i-Martin, 2003):

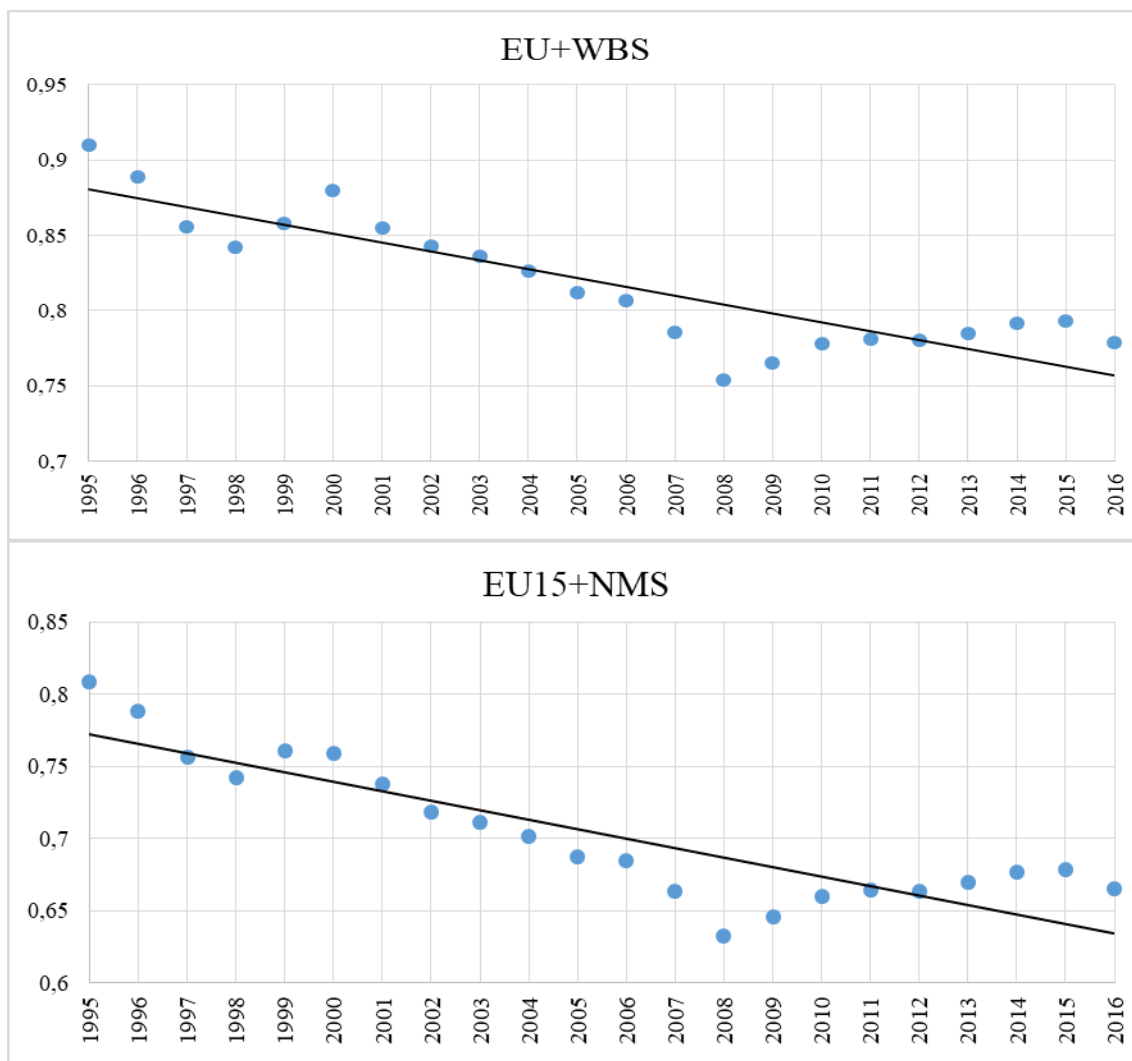
$$1/T \log(y_{it}/y_{i0}) = \alpha + \alpha_1 \log y_{i0} + u_{it},$$

where:

y_{it} - GDP per capita of the country i in the year t ; y_{i0} - the initial GDP per capita of the country i ; T - observed period (1995-2016); α - constant; u_{it} - standard error. If the coefficient α_1 has a negative sign, beta convergence exists.

RESULTS AND DISCUSSION

The results of sigma convergence are shown in Figure 3. In the observed group of countries (EU + WBS) there is a trend of decreasing coefficient of variation, so it can be said that income convergence exists. The decrease in GDP per capita dispersion is noticeable in the EU15 + NMS group, i.e. in the European Union. This means that EU countries converge in the GDP per capita in the entire observed period. In both groups of countries, an increase in the coefficient of variation from 2008-2011 was observed as a result of the Crisis, which resulted in a income divergence in these years.



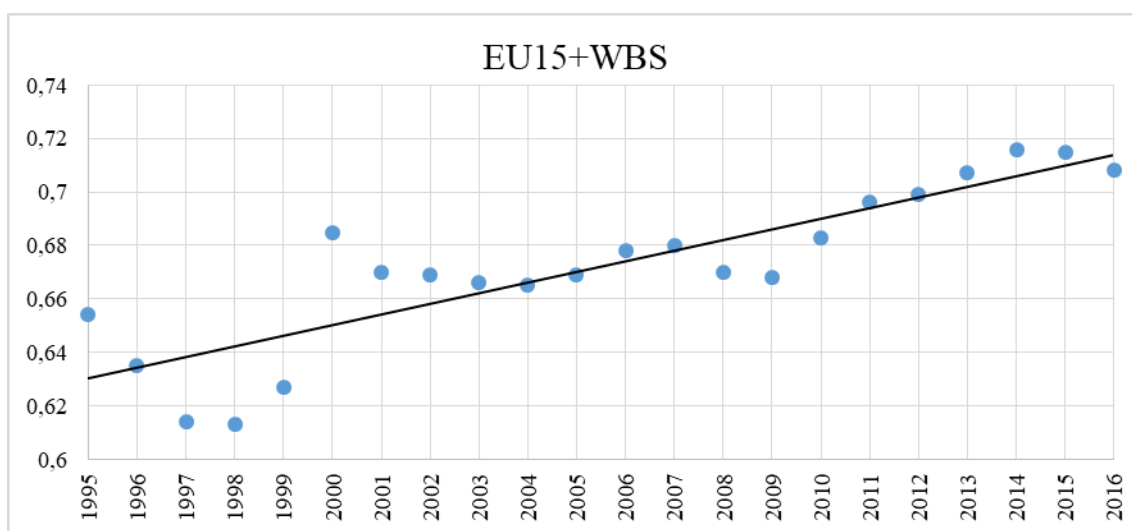


Figure 3: Coefficient of variation of GDP per capita for EU+WBS, EU15+NMS and EU15+WBS (1995-2016)

Source: The World Bank, author's calculation

Growing trend of coefficient of variation of WBS and EU15 groups is recorded. Therefore, it can be concluded that the WBS have not converged to the income level of the most developed EU countries, but have converged to the income level EU.

The results of the regression analysis of beta convergence are shown in Table 1, for the entire observed period (1995-2016), as well as for the three subperiods (1995-2000, 2001-2008 and 2009-2016). In the whole observed period, there has been a income convergence the EU countries and WBS, because the coefficient α_i is negative with a statistical significance at a level below 5%, and R^2 of 0.775. Such results are in line with the set hypothesis that the WBS are catching up the EU member states. In the subperiods 1995-2000 and 2001-2008, income convergence existed, while in post-crisis years (2009-2016) it was not proven.

Table 1: Regression results of β -convergence

EU+WBS								
	1995-2016		1995-2000		2001-2008		2009-2016	
	Coef.	<i>p</i>	Coef.	<i>p</i>	Coef.	<i>p</i>	Coef.	<i>p</i>
Constant	0,203	<0,0005	0,181	0,007	0,389	<0,0005	0,069	0,082
log y_i	-0,02	<0,0005	-0,019	0,008	-0,029	<0,0005	-0,01	0,069
R^2	0,775		0,212		0,702		0,102	
EU15+NMS								
	1995-2016		1995-2000		2001-2008		2009-2016	
	Coef.	<i>p</i>	Coef.	<i>p</i>	Coef.	<i>p</i>	Coef.	<i>p</i>
Constant	0,225	<0,0005	0,171	<0,0005	0,476	<0,0005	0,097	0,112
log y_i	-0,02	<0,0005	-0,018	<0,0005	-0,038	<0,0005	-0,1	0,098
R^2	0,785		0,399		0,805		0,102	
EU15+WBS								
	1995-2016		1995-2000		2001-2008		2009-2016	
	Coef.	<i>p</i>	Coef.	<i>p</i>	Coef.	<i>p</i>	Coef.	<i>p</i>
Constant	0,169	<0,0005	0,176	0,097	0,31	<0,0005	0,029	0,517
log y_i	-0,02	<0,0005	-0,019	0,086	-0,021	<0,0005	-0,004	0,422
R^2	0,702		0,163		0,763		0,036	

Source: author's calculation

The existence of beta convergence has also been tested among EU countries and among EU15 and WBS. EU countries converged throughout the observed period, as well as in the subperiods 1995-2000 and 2001-2008, which proves the negative sign of the α_1 coefficient and statistical significance at the level below 5% ($p < 0.0005$). In post-crisis years, income convergence has not been proven. The WBS have converged towards the developed countries of the EU in the whole observed period, which is proven by strong regression statistics ($p < 0.0005$ and $R^2 = 0.702$). In addition, the WBS achieved faster per capita GDP growth in the subperiod 2001-2008, i.e., in the years from the beginning of the transition to the outbreak of the Crisis. In the other two subperiods (1995-2000 and 2009-2016), income convergence has not been proven.

CONCLUSIONS

One of the main expectations of developing countries, on the path of transition and joining the EU, is to achieve the level of standard of living of developed EU countries. Therefore, the main goal of the Western Balkans States is the acquisition of full membership in the EU. Such expectations are in line with the income convergence theorem, which implies catching up of countries of different levels of development, i.e., faster growth of developing compared to developed countries.

Over time, numerous research on income convergence among EU countries has appeared, but also a much smaller number of research among the EU and WBS countries. The aim of the paper was to examine the existence of income convergence between the EU countries and the WBS in the period from 1995 to 2016. The results show the existence of both types of convergence (sigma and beta) between EU and WBS. However, sigma convergence has not been proven between the EU15 and WBS countries, while beta convergence between these two groups has been proven. The results indicate that it is possible to confirm our assumption that the WBS are catching up the income level of EU.

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THE IMPACT OF FOREIGN DIRECT INVESTMENTS ON HOST COUNTRY MARKET STRUCTURE: A CASE OF SERBIA'S AUTOMOTIVE INDUSTRY

Marija Radulović¹

Abstract: Foreign direct investments (FDI) are one of the critical factors for the countries' development and their market structure. The inflow of FDI has increased significantly in Serbia in recent years. The automotive industry is one of the most important industrial sectors in Serbia, where more than 60 foreign companies have invested over 1.7 billion euros in the form of FDI. According to the number of investment projects, the automotive industry is leading with a share of 16.8% of the total number of projects. Observed by the value of the investment, this industry with 9.7% occupies the fourth place, with the most significant number of projects and the highest amount of investment from Germany, Italy, and France. The manufacturing of tires (Tigar Tyres located in Pirot and Cooper Tires and Trayal in Krusevac) and suspension parts (a FAD in Gornji Milanovac) is the most prominent activity in the industry. Wiring harness (Yura Corporation in Leskovac, Draxlmaier in Zrenjanin, Yazaki in Sabac) and plastic parts (Magneti Marelli and SCGM in Kragujevac) are also essential products in the industry. The most challenging parts of the automotive industry are related to the production of engines, transmissions, brakes, steering systems, relays, and electronics while, products from groups of cable installations, rubber hoses, seats and castings are dominant in foreign companies. Furthermore, domestic companies' production is based on the production of vehicle accessories, superstructure, spare parts, motor and plastic repairs, tires and tools. The main reasons for the significant investments in Serbian automotive industry are highly-qualified staff, enough capacity for large volumes of production, excellent geographic location for efficient distribution of products to EU, SEE and Middle Eastern countries. The paper aims to determine the relationship between FDI and market structure in Serbia's automotive industry. Three firms concentration ratio is used to measure market power and to give a background for understanding the relationship between FDI and market structure. The regression analysis is applied to analyze annual data from 2006 to 2016. Results showed that there is a statistically significant and positive relationship between FDI and market concentration. Furthermore, if $\ln FDI$ changes for 1% than market concentration ($\ln CR5$) will increase by 0.13%, while all other conditions remain unchanged, at 5 % significance level.

Keywords: foreign direct investment (FDI), market structure, automotive industry, market concentration, Serbia

JEL Classification: F 21, F 23, L 11

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INTRODUCTION

Creating an environment that attracts foreign direct investment (FDI) is one of the priorities of the economic policy of developing countries such as the Republic of Serbia. The most favorable are foreign investments that affect productivity growth and technological advancement, as they stimulate competitiveness and exports. The goal of the country in this area is to maintain and direct internationally competitive, export-oriented investments in addition to the development of domestic firms. The main questions in this area are whether foreign companies boost the growth of domestic companies, or crowd-out domestic investments, whether these companies have a higher market share or not. Consequently, the paper will focus on the analysis of the effects of FDI on the host country market structure, that is, FDI in the automotive industry in Serbia, to determine whether these investments increase or decrease concentration in this sector. According to the defined research subject, the following hypothesis was set: FDI have a statistically significant and positive impact on the market concentration in Serbia's automotive industry.

The paper is organized as follows. A review of the existing empirical literature on the impact of FDI on the host country market structure in the manufacturing industry is presented in section 2. Section 3 presents the methodology, general settings of the regression model, the variables and statistical-econometric tests that will be used in the analysis. Section 4 shows the results of the research with explanations, while section 5 gives limitations and recommendations for further research.

LITERATURE REVIEW

The literature on the impact of FDI on the host country market structure is not extensive, especially regarding empirical research. Nevertheless, empirical research has confirmed the thesis about the effect of FDI on the host country market concentration, especially in the manufacturing industry (Forte & Sarmento (2012); Singh (2011); Rutkowski (2006); Adam & Khalifah (2012); Yun & Lee (2001)). The research results are ambiguous; some authors found positive impact of FDI on market concentration (Singh (2011), Bourlakis (1987)), others determined negative implications (Driffield (2001); Rutkowski (2006)) while Ames & Roberts (1987) concluded that there is no statistically significant effect of FDI on host country market structure. Furthermore, applied methods for the data analysis are different, but before the 1990's the most commonly used is Ordinary Least Square method (OLS) (Blomstrom (1987), Willmore (1987)). After 2000, the authors used pooled and panel models for data analysis (Singh (2001); Forte & Sarmento (2012)).

Yun & Lee (2001) analyzed the impact of FDI on host country market concentration in Korean manufacturing industry from 1991 to 1997 using simultaneous estimation. They found a positive effect of the ratio of cumulative FDI to fixed assets (explanatory variable) on market concentration (CR3 as the dependent variable). Singh (2011) investigated the impact of FDI on the market concentration in the Indian manufacturing industry from February 2001 to July 2006 (table 1). The author used pooled and panel models to analyze data. The concentration ratio of the three largest companies (CR3) was the dependent variable, while the independent variables were: the sales share of foreign companies in the total sales of the industry, the market growth rate, and others. The results of the study show that there is a statistically significant positive impact of FDI on the market concentration. Moreover, Singh (2011) concluded that the change of foreign share of sales for one unit leads to an increase in market concentration by 24.9%.

Driffield (2001) studied the impact of FDI on the market concentration in the manufacturing industry of the United Kingdom between 1983 and 1992. He found the opposite results than Singh (2011) and applied the different method for data analysis (stochastic frontier analysis,

simultaneous equation). According to the results of his research, FDI reduced the level of market concentration and improved competition in the UK manufacturing industry (table 1).

Forte & Sarmiento (2012) also found that there is a negative impact of FDI on the market concentration in the manufacturing industry. They studied the Portuguese manufacturing industry from 2006 to 2009 and applied pooled and panel models for data analysis. The dependent variable was the concentration ratio of 4 largest firms (CR4) while the foreign share of manufacturing industry sales was an explanatory variable (table 1). They also included market size, market growth rate, R&D intensity, economies of scale, capital intensity and advertising intensity as independent variables.

Table 1. Literature Review

Author	Industry	Country	Years	Method	Impact
Blomstrom (1986)	Manufacturing industries	Mexico	1970	OLS	+
Bourlakis (1987)	Manufacturing industries	Greece	1975/1979	OLS	+
Willmore (1989)	Manufacturing industries	Brazil	1980	OLS	+
Yun & Lee (2001)	Manufacturing industries	Korea	1991-1997	Simultaneous equation	+
Singh (2011)	Manufacturing industries	India	2001/2002-2006/2007	Pooled and panel models	+
Adam & Khalifah (2012)	Manufacturing industries	Malaysia	2001-2004	Pooled and panel models	+
Driffield (2001)	Manufacturing industries	United Kingdom	1983-1992	Simultaneous equation	-
Rutkowski (2006)	Manufacturing industries	13 CEECs	2001	IV Probit and Non-linear IV Tobit	-
Forte & Sarmiento (2012)	Manufacturing industries	Portugal	2006-2009	Pooled and panel models	-
Orazalin & Dulambaeva (2013)	Manufacturing industries	CEE & CIS	2000	2SLS IV	-
Ames & Roberts (2005)	Manufacturing industries	Poland	1989-1993	GMM with IV	0

Source: Author

According to Orazalin & Dulambaeva (2013), FDI have a negative impact on the host country market concentration. They examined the relationship between FDI, market concentration and profitability of 26 CEE and CIS countries using instrumental variables method. They used FDI stock for 2000, while the dependent variable was dummy variable (1 if the company has 1-4 competitors, high concentration, 0 if the company has more than four competitors, low concentration).

Review of empirical researches in manufacturing industry give us insights that results are not consistent and depend on the period, applied method and used data for the independent and

dependent variable. Moreover, the author did not find any research about the impact of FDI on the host country market concentration in the automotive industry.

METHODOLOGY

A literature review found that many indicators influence the host country market concentration, but the most important for this research is FDI. Following previous research (Singh (2011); Yun & Lee (2001), Forte & Sarmiento (2012)) and hypothesis, the following model was analyzed in the paper:

$$CR3_t = f(FDI_t) \quad t=1, 2, \dots n \quad (1)$$

$$CR3_t = b_0 + b_1 * FDI_t + \varepsilon_t \quad t=1, 2, \dots n \quad (2)$$

wherein:

CR3_t – three firms concentration ratio

FDI_t – FDI inflow in the automotive industry in t period

All data are converted to the logarithmic form due to statistical reasons. After conversion, the model has the following form:

$$\ln CR3_t = b_0 + b_1 * \ln FDI_t + \varepsilon_t \quad t=1, 2, \dots n \quad (3)$$

The annual data were collected from the databases of the National Alliance for Local Economic Development (NALED), Development Agency of Serbia, Serbian Business Registers Agency and National Bank of Serbia for the period between 2006 and 2016. Data analysis was conducted using the EViews 10 software and applying the Ordinary Least Square method (OLS).

RESULTS AND DISCUSSION

Foreign direct investment is a form of investment where the foreign investor provides the right of ownership, control, and management of the company to which the funds have been invested to achieve some long-term economic interest. The inflow of FDI has increased significantly in Serbia in recent years. The automotive industry is one of the most important industrial sectors in Serbia, where more than 60 foreign companies have invested over 1.7 billion euros in the form of FDI.

Table 2. Descriptive statistics

	lnCR3	lnFDI
Mean	-0.50	4.84
Maximum	-0.11	6.85
Minimum	-0.97	2.60
Standard deviation	0.24	1.38

Source: Author's calculation in Eviews 10

Accounting for 10% of the Serbian export, around 14% of the value of foreign investments and employing more than 40,000 workers, the automotive industry is undoubtedly the most important industrial sector in Serbia (Development Agency of Serbia, 2017).

According to table 2, the average value of variable lnFDI is 4.84 (251.73 million euros), the maximum value is 6.85 (950 million euros in 2008), and the minimum value is 2.60 (13.5 million euros in 2011). The maximum value in 2008 is recorded mainly due to Fiat Chrysler Automobile (FCA) investment of 940 million euros which was established by a joint venture agreement between Fiat Group Automobiles (67%) and the Republic of Serbia (33%). The most significant and the largest FDI in the automotive industry are recorded in the Sumadija region such as Fiat Chrysler Automobiles, Bacchis Osiride, Magneti Marelli, etc. all greenfield investments (figure

1). Moreover, Yura Corporation invested 8 million euros as a brownfield investment. The most important country regarding the value of investments is Italy, whose share in the total value of FDI in the automotive industry is approximately 60% (Đorđević, 2015).

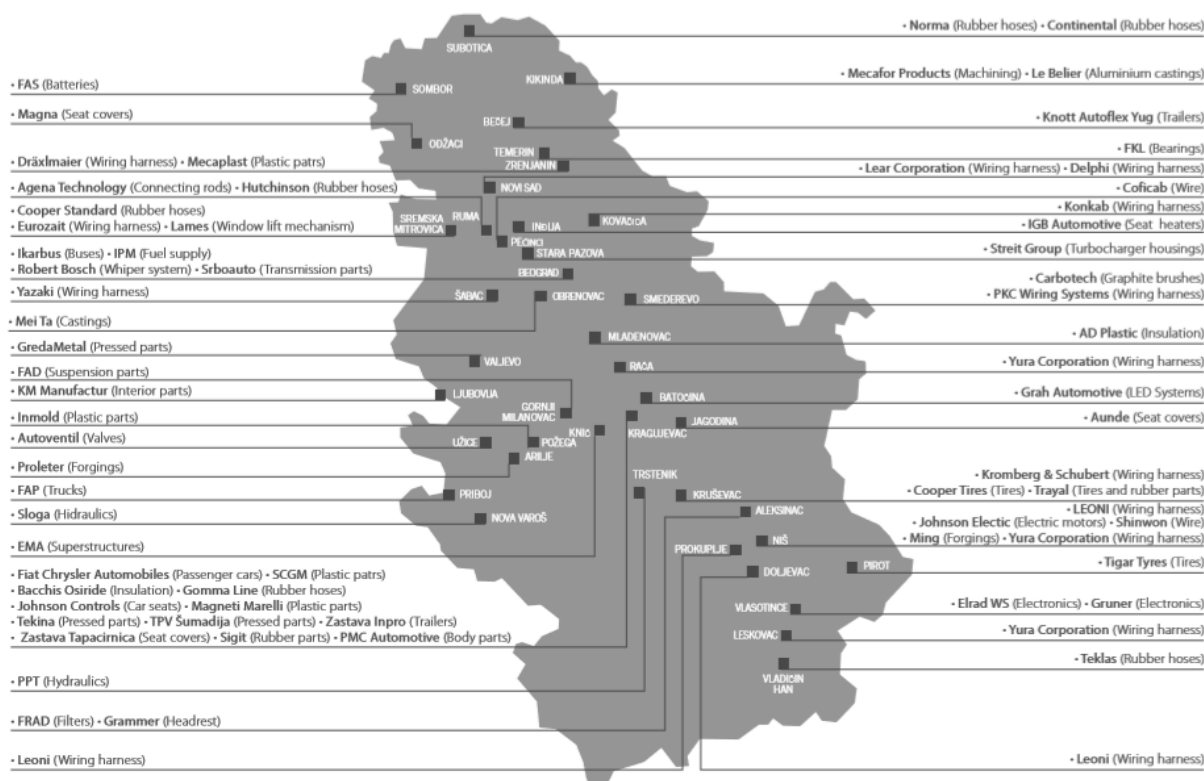


Figure 1: The largest companies in Serbian automotive industry

Source: www.ras.gov.rs/uploads/2017/03/automotive-small.pdf, 25.08.2018.

More than 25% of all foreign companies that decide to invest in Serbia invest in the automotive industry, which points to the development possibilities of this industry (Kalinić, 2017). The most challenging parts of the automotive industry are related to the production of engines, transmissions, brakes, steering systems, relays, and electronics while, products from groups of cable installations, rubber hoses, seats and castings are dominant in foreign companies (figure 2). Furthermore, domestic companies' production is based on the production of vehicle accessories, superstructure, spare parts, motor and plastic repairs, tires and tools.

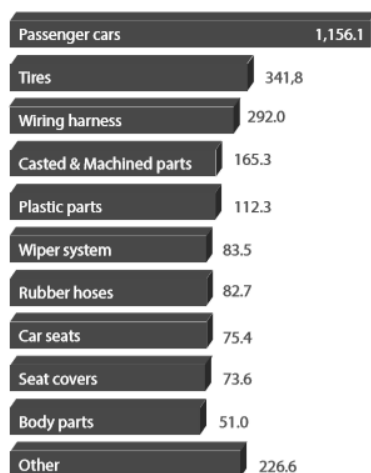


Figure 2: Major Products Groups Value of production 2015 (million €)

Source: www.ras.gov.rs/uploads/2017/03/automotive-small.pdf, 24.08.2018.

The manufacturing of tires (Tigar Tyres located in Pirot and Cooper Tires and Trayal in Krusevac) and suspension parts (a FAD in Gornji Milanovac) is the most prominent activity in the industry. Wiring harness (Yura Corporation in Leskovac, Draxlmaier in Zrenjanin, Yazaki in Sabac) and plastic parts (Magnetit Marelli and SCGM in Kragujevac) are also essential products in the industry. Today, the automotive industry contributes to the country's exports with \$2.1 billion (SIEPA, 2015).

The main reasons for the significant investments in Serbian automotive industry are highly-qualified staff, enough capacity for large volumes of production, excellent geographic location for efficient distribution of products to EU, SEE and Middle Eastern countries. Positive trends include the definitive growth of the sector; the arrival of world brands in the automotive industry; first steps in the integration of domestic suppliers; specific cooperation of local companies with scientific-research institutions (Development Agency of Serbia, 2017).

The concentration ratio of the three largest companies shows the sum of the market shares of the three largest companies in the sector, or how much of the total market is covered by a group of the three largest companies (Filipovic et al., 2016). The average value of the variable $\ln CR3$ is -0.50 (62%), while maximum and the minimum value are -0.11 (89% in 2013) and -0.97 (38% in 2011), respectively (table 2). The European Union consider that a high level of concentration exist when this index exceeds the value of 25 (Kostić, 2008). In addition to Fiat Chrysler Automobiles manufacturing and its subcontracting companies (Johnson Controls, Magnetti Marelli, Sigit and PMC Automotive), significant growth in activity has also been seen in other companies operating in the automotive industry. The annual turnover of these companies increased by over 50% compared to 2011 (National bank of Serbia, 2013). The largest companies measured by annual turnover in the past seven years, are Fiat Chrysler Group, Tigar Tyres and Yura Corporation (figure 3). The chart shows annual turnover for these three companies from 2010 to 2016. According to the Development Agency of Serbia, 68% of all companies in the automotive industry are small and medium-sized (SMEs), but they generate only 7.87% of industry revenues (2017). The 32% of companies in the sector make 92.13%.

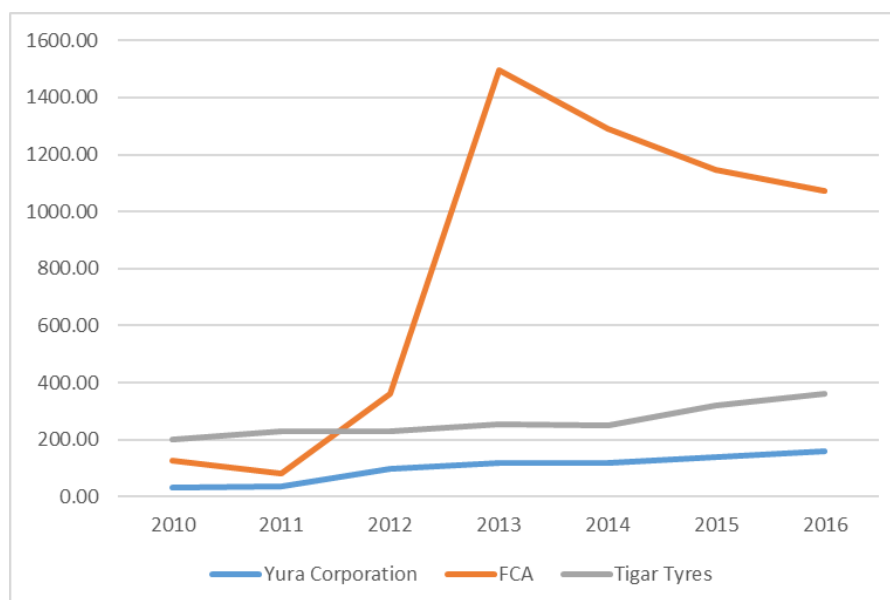


Figure 3. FCA, Tigar Tyres and Yura Corporation annual turnover from 2010 to 2016
Source. Serbian Business Registers Agency, 20.08.2018.

According to the results of the regression analysis given in Table 3, the regression equation has the following form:

$$\ln CR3_t = -1.17 + 0.13 * \ln FDI_t \quad t=1, 2, \dots, n \quad (4)$$

Table 3. Estimation Results

lnCR3	Coef.	Std. Err.	t-stat.	Prob.
lnFDI	0.13	0.05	2.47	0.04
C	-1.17	0.27	-4.32	0.00
R-squared	0.47	Adj. R-squared	0.39	F-stat. = 6.11 Prob(F) = 0.04

Source: Author's calculation in Eviews 10

The results obtained from the model show that there is a statistically significant impact of FDI (variable lnFDI) on market concentration in the Serbian automotive industry at a 5% significance level. Moreover, the effect of FDI on market concentration is positive. It means that if lnFDI changes for 1% than market concentration (lnCR3) will increase by 0.13%, while all other conditions remain unchanged. The results are consistent with previous empirical research which also found a positive relation between FDI and market concentration (Singh (2011); Yu & Lee (2001); Bourlakis (1987)).

The coefficient of determination (R-squared=0.47) of the observed model is 47%, which shows that 47% of the variation of the dependent variable is explained by the influence of the independent variables, while the impact of other factors causes the remaining 53% of variations. The adjusted R-squared is 0.39 which shows that this model describes 39% of the deviation of the independent variable.

The existence of serial correlation and multicollinearity, heteroskedasticity and whether the residuals have normal distribution is tested for the model. The Jarque-Bera test of normality showed that the residuals are normally distributed (p-value=0.73) at 5% significance level. The absence of heteroskedasticity was tested using the Breusch-Pagan-Godfrey test. The null hypothesis that variance is constant (homoscedasticity) is accepted at significance level 5% (p-value=0.76). Variance Inflation Factor (VIF) showed that there is no multicollinearity between variables (VIF=1<5). The Breusch-Godfrey Serial Correlation LM test showed the absence of serial correlation (p-value=0.66). Autocorrelation was tested using Durbin-Watson statistics (DW = 1,87) indicating that there is no autocorrelation problem in the model. Field (2009) considers that values below 1 and above are worrying. The results suggest that the model formed in equation 3 is well-specified.

CONCLUSIONS AND RECOMMENDATIONS

In contemporary economic theory, there is still no consensus on the relationship between FDI and the market structure of the host country, but empirical researches have confirmed the thesis about the impact of FDI on the change in the market structure of the host country. The research hypothesis that there is a statistically significant relationship between the FDI inflow and the level of market concentration in the Serbian automotive industry is confirmed. Also, it has been determined that the FDI positively influences the level of market concentration in the Serbian automotive sector measured through the concentration ratio of the three largest companies.

According to the author's knowledge and based on the reviewed literature about the influence of FDI on the host country market structure, there are no researches that examine the effects of FDI on the level of market competition only in the automotive industry. Therefore, the paper will contribute to the existing literature providing information on the possible FDI effects in this area. Future research in this area can be extended to the level of individual countries, depending on the availability of the data necessary for such research, or more sectors may be included. An increase in the number of appropriate explanatory variables to carry out better quality analysis for a more extended period is also possible.

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INVESTMENTS IN SUSTAINABLE DEVELOPMENT – PATH TO A BETTER FUTURE

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Abstract: *Today, a number of efforts are being made to raise the awareness of the need for sustainable development at the appropriate and necessary level, both in the direction of legislation, and by taking practical measures and activities contributing to sustainable development, as well as by allowing investment in various projects in this plan. In the late 1990s, investments in sustainable development began to be seen as an indispensable tool in achieving economic and sustainable development. Global Sustainable Development Goals for 2016-2030. in the focus put sustainable development, the fight against poverty and climate change, while achieving these goals depends on investments in sustainable development, which must be quantitatively more and qualitatively more sustainable. The transition from unsustainable practices in agriculture, energy, water and natural resources, industry and other sectors, according to more sustainable practice, requires investments at national and international level. Numerous authors dealing with these issues agree that investing in sustainable development (whether domestic or foreign investment) provides a full range of benefits to one national economy: it stimulates growth, increases efficiency, enables enterprises from developing countries to penetrate the global market, implementing environmentally superior technologies and managerial skills, increasing employment and more. Because of the importance of investments in sustainable development, especially in terms of foreign investments, appropriate investment policies, investment principles and other important activities for investment in sustainable development is realized in practice. The national strategy for the sustainable development of the Republic of Serbia is also show the importance of investments in sustainable development, and how important it is to adopt global investment principles. In the part of the strategy that talks about key national priorities, one of the main goal is to improve conditions for attracting foreign direct investments. Contrary, insufficient number of greenfield investments and investments in infrastructure as well as in reducing pollution from agriculture are highlighted as one of the key deficiencies. The author of this paper will present the key principles of investment in sustainable development and the framework for investment policies, as well as the significance and practice of foreign direct investments in sustainable development, which are particularly important from the aspect of developing countries, including the Republic of Serbia.*

Key words: *investments, sustainable development, principles, investment policies, foreign direct investments*

JEL Classification: *E 22, Q01*

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INTRODUCTION

The basic strategy of the development of modern human society is based on preservation of natural resources and the protection of the human environment. For all this, nowadays one of the most important issues, raised in international relations in general and in particular in the lower sub regional plan, is the issue of regulating the use and protection of shared natural resources, at all levels - from local to global. Given that progress in achieving the Millennium Goals for 2015 has not been achieved equally in all countries and that stated goals have not been met, on September 25, 2015, the Sustainable Development Summit launched the Sustainable Development Program 2030, which defined 17 Global Sustainable Development Goals, with the aim to achieve sustainable development by expanding the universal need for the development of the well-being of all people.

In addition to international activities, a significant step towards sustainable development is also a national strategy for the sustainable development of countries, as well as the measures and activities undertaken by the states. In 2005, the Republic of Serbia started the development of the National Sustainable Development Strategy, adopted in 2008. This Strategy defines national development priorities, institutional framework (institutions responsible for implementation of the Strategy), as well as sources and methods of financing the implementation of the Strategy.

However, in addition to conferences, summits and declarations, agendas and strategies for sustainable development, it is clear that in practice the implementation of the goals of sustainable development requires much more, and includes coordination in taking measures to achieve the stated goals, knowledge exchange, innovations and assistance of international organizations, and developed countries to underdeveloped and developing countries in meeting desired standards and goals. States will have to invest enormous financial resources in alternative energy-producing technologies such as wind turbines, solar panels and nuclear power plants, in the implementation of poverty reduction strategies, the greening of the economy and industry, and numerous other activities. Any such action involves high costs, which makes investment in sustainable development a key prerequisite for the effective realization of sustainable development. This is precisely what indicates the importance of investments and the necessity for a deeper analysis of investment issues in sustainable development in this paper. A key hypothesis of the research will be that investments are one of the basic tools for achieving sustainable development, especially in developing countries, such as the Republic of Serbia. Accordingly, the objectives of this paper will be to indicate that:

- investing in sustainable development paves the way for a better future for all of us,
- the application of the principles and framework for investing in sustainable development in national strategies, laws, plans, etc. greatly facilitates investment in areas of importance for the sustainable development of a given country,
- as well as that foreign direct investments are one of the drivers of economic development in general, and especially sustainable development of both developed and developing countries.

LITERATURE REVIEW

Even though the basic concept of sustainability goes back many centuries, it has only recently appeared on the international political agenda (Filho et al. 2018). As of the mid-1970s, particularly since the appearance of the well-known Roman club, a new concept of social development is emerging - "The concept of sustainable development", which today has a central place in considering the long-term perspective of existence and progress of mankind (Radosavljević, Mladenović, 2018). Due to the increasing problems facing the world, such as poverty, climate change, economic inequalities etc., in the last decades, sustainable development has been the focus of study of many authors. With the human population set to rise to 9 billion by 2050., definitions of sustainable development must be revised to include the security of people

and the planet (Griggs, Stafford-Smith, Noble, 2013). Sustainable development concerns the whole planet. If we want to live in a healthy environment, all of us must respect environmental limits. As members of the present generation, we have important obligation – to hold the Earth in trust for future generations. Sustainable development is essentially a strong ethical, or moral pronouncement as to what should be done (Holden, Linnerud, Banisten 2016). Every individual on Earth is responsible for sustainable development. However, the greatest responsibility is still on larger actors. Companies, governments and other organizations are essential for sustainable development (Roorda, 2016). In order to achieve the goals, the cooperation of all actors is necessary. Transitioning to a sustainable society is obviously a complex endeavor, requiring, e.g., extensive, coordinated collaboration across disciplines and sectors (Broman, Robert, 2017).

Sustainable development goals are an important idea, and could help finally to move the world to a sustainable trajectory (Sachs, 2012). The achievement of the global goals of sustainable development, especially in underdeveloped and developing countries, depends primarily on foreign investments, a fact agreed both by local and foreign authors who have dealt with this area, such as Kardos and Stefanović. With the aim to achieve the Global Sustainable Development Goals by 2030, various investment mechanisms in the international community, from state subsidies, private sector investment to foreign direct investment, have been developed. In order to make investment easier, reduce investment risks, but also improve long-term investment prospects, the United Nations (UN) has developed the principles of investing in sustainable development, and UNCTAD has adopted a framework for investment policies for sustainable development, which, as a key objective, has the creation of uniform guidelines and rules in establishing national investment policies and international investment practices, which encourage investments focused on sustainable development and inclusiveness. Since the end of the first millennium, when they started to grow, foreign direct investments are nowadays a driver of sustainable development in many countries of the world, especially those in development. This is also the case with the Republic of Serbia. At the beginning of the second millennium, Serbia, due to the lack of capital, faced with the difficulties in economic growth. In order to recover its economy, one of the best solutions for Serbia was to attract foreign capital. As a result of the reforms, implemented in various areas, Serbia is now ranked as the 15th among European countries by attracting foreign direct investments, according to the survey results on the activity of the European market of the auditing and consulting company EY. Since this fact, which is relatively new, has not been devoted enough attention so far, the author will try to correct it with this paper. This will show, on the example of the Republic of Serbia, the real significance of foreign direct investments and investments in sustainable development in general, for the future of not only the present, but the new generations as well.

METHODOLOGY

In considering the subject matter of the research and based on the set objectives of the work, the following methods of research were used: the method of analysis and synthesis, because the work is based on strategic documents and legal regulations that are essential for the field of investments in sustainable development. Considering that the relevant literature and official statistic and other publications were used, it was necessary to perform an adequate selection of data and their analysis, and then, with the use comparative and analogy methods as well as the historical method, to compare trends in investments in sustainable development in the countries of the European Union and the Republic of Serbia in recent years, and to describe in detail the important facts regarding the policy and framework for investing in sustainable development, as well as foreign direct investments, for which the method of description was used.

Considering the starting hypothesis that investing in sustainable development is a way to a better future, the verification method has been applied. In this paper, special attention is paid to foreign direct investments as one of the basic tools for achieving sustainable development, and through the research of examples of good practice in this area, points to the guidelines and strategic steps that can be taken in order for the Republic of Serbia to follow in the footsteps of the best. Also, the necessity of political will for all these processes will be demonstrated, which is a well-known fact of the famous nobleman Pol Krugman, that Mladenović and Arsić (Mladenović, Arsić 2017) and Sauvand and Hamdani (Sauvant, Hamdani, 2015) also notice in their work.

RESULTS AND DISCUSSION

Principles of Investing in Sustainable Development

Nowadays, there are several different categories of investment in sustainable development principles that have been developed to include social, environmental and governance criteria in the process of making investment decisions. The principles of investment in sustainable development are structured and brought up at different levels (from global, regional to national), and global investment principles have a large number of signatory countries that accept these principles for various reasons, from enhancing reputation on the international scene, to minimizing risk of investing and improving the long-term foreign investment perspective.

Key research principles are mainly public, globally applicable principles, national investment principles and investment principles applicable in specific sectors. Public and private globally applicable principles have been defined by the United Nations in the Principles for Responsible Investment (PRI) document, and today considered the most well-known and widespread applied set of principles of investment in sustainable development. UN principles are based on the premise that institutional investors and managers are obliged to act in the best long-term interest of their investors and should therefore devote adequate attention to environmental issues, social issues and responsible governance (www.unpri.org). The scheme of these principles is universal, regardless of the location of the investors, and their acceptance is voluntary, and the signatories² are committed to incorporate environmental, social and governance principles into all their investment decisions, regardless of the type of assets or location. The UN-defined principles are followed by a set of 35 possible activities that investors and managers can integrate into the governance of investment activities. These actions relate to different issues, such as the investment decision-making process, transparency, cooperation and the wider support to this practice in the sector/financial services industry. In general, the UN Principles for Responsible Investment (www.unpri.org) include six principles that require institutional investors to:

- 1) incorporate environmental, social and governance issues into investment analysis and decision-making processes;
- 2) be active owners and include environmental, social and governance issues in ownership policies and practices;
- 3) seek appropriate disclosure on environmental, social and governance issues by the entities in which they invest;
- 4) promote acceptance and implementation of the Principles within the investment industry;
- 5) work together to enhance their effectiveness in implementing the Principles;
- 6) report on activities and progress towards implementing the Principles.

When talking about the principles of investment, one cannot overlook the 11 principles outlined in the OECD Guidelines for Multinational Enterprises, applied in 42 OECD countries that are the source of the largest share of foreign direct investment. Unlike the UN principles relating to the public sector, OECD principles relate to the private sector, i.e. multinational enterprises.

² Since launching in 2006 the number of signatories has grown from 100 to over 1.800.

Finally, there are investment principles pertaining to individual sectors or industries, and as an example of this we can indicate the principles of investment of the European Investment Bank.

Investment Policy Framework

The UNCTAD Framework for Investment Policies for Sustainable Development was officially adopted at the Conference on Financing for Development in Addis Ababa in 2015. This framework provides guidance to policymakers for a new generation of investment policies. The Investment Policy Framework for Sustainable Development consists of a comprehensive set of basic principles for policy makers in the field of investment in sustainable development and consists of three sets of operational or action guidelines:

- guidelines for national investment policies,
- guidelines for the design and implementation of international investment agreements, and
- an action menu for the promotion of investments in sectors related to sustainable development goals (UNCTAD, 2015).

The core objective of the UNCTAD framework for investment policies is to create uniform guidelines and rules in establishing national investment policies and international investment practices that encourage investment focused on sustainable development and inclusiveness. In this regard, investments in infrastructure, renewable energy, water governance, food security, health care and education are particularly addressed.

Foreign Direct Investment for Sustainable Development

We have already noted that the achievement of the global goals of sustainable development for the period 2016-2030, with a focus on sustainable development, the fight against poverty and climate change, primarily depends on investments in sustainable development, which must be bigger and more sustainable. The previously analyzed investment principles and the framework for sustainable development policies should enable the fulfilment of increased demand for investment at the national level, through the creation of preconditions for obtaining investments. The achievement of the Global Sustainable Development Goals (SDGs), especially in underdeveloped and developing countries, depends primarily on foreign investment. The demand for foreign direct investment, in order to ensure current growth and future sustainable growth, renew the infrastructure, and solve the challenges of demographic and energy transition arises from the necessity for major investment in education, energy efficiency and infrastructure. The need for investment in education arises from the adequate preparation of young people for productive jobs, and the need for infrastructure investment from the necessity to adapt and mitigate the consequences of climate change. These needs far exceed the ability of states to finance investments through public expenditures, even in the case of developed countries. In this sense, foreign direct investment is the backbone of investing in sustainable development (Kardos, 2014). The contribution of the FDI to the economic development of the country, and therefore the reduction of regional inequities, is primarily reflected to the additional resources they carry with them: transfer of capital, technologies, managerial and organizational knowledge and skills, access to export markets, increasing the efficiency of the domestic economy by lowering production costs (direct) and fostering competition at the domestic market (indirectly), the use of economy scale and others (Dašić, 2011).

According to certain estimates of UN, it is expected that the transition from conventional to green economies will affect investments in the next two decades of over \$1,000 billion, which will generate approximately 60 million new jobs (Premović et al. 2018). The SDGs will have very significant resource implications across the developed and developing world. Global investment needs are in the order of \$5 trillion to \$7 trillion per year. Estimates for investment need in developing countries alone range from \$3.3 trillion to \$4.5 trillion per year, mainly for basic

infrastructure (roads, rail and ports; power stations; water and sanitation), food security (agriculture and rural development), climate change mitigation and adaptation, health, and education (UNCTAD, 2014).

An example of the positive effects of foreign direct investment for sustainable development can be found in Brazil. Namely, in the second half of the 1990s, the inflow of foreign direct investments into the pulp and paper production sector in Brazil began, with the aim of developing the production of pulp produced from a mixture of two fibers, thereby increasing the content of short fiber in pulp, which is the cheapest and most cost-effective way of pulp production. As a result, this caused a great demand in the international market (Santos Rocha, Togeiro de Almeida, 2007). Also, the goal of investments was to further develop and improve the production technology of short-fiber pulp production from eucalyptus. In the period from 2000 to 2004, investments amounted to 139 million \$ a year. Considering the great impact this industry has on the environment in terms of timber and water consumption, investments have led to a reduction in the negative effects of the sector on the environment through the introduction of the timber cultivation used in production (Santos Rocha, Togeiro de Almeida, 2007). An increase in the number of job positions also contributed to the sustainable growth of the sector, which required educated and skilled workforce that can meet the needs for more efficient resource management.

Table 1. The European foreign investment map

Year/Country	2016	2017	Change in rank vs. 2016	Share (2017)	% change	Jobs created	Jobs share
UK	1.138	1.205	-	18%	6%	50.196	14%
Germany	1.063	1.124	-	17%	6%	31.037	9%
France	779	1.019	-	15%	31%	25.126	7%
Netherlands	409	339	-	5%	-17%	8.541	2%
Russia	205	238	+2	4%	16%	25.788	7%
Spain	308	237	-1	4%	-23%	13.685	4%
Turkey	138	229	+3	3%	66%	13.078	4%
Belgium	200	215	-	3%	8%	5.838	“0%
Poland	256	197	.	3%	.	24.000	7%
Finland	133	191	+1	2%	44%	4.300	1%
Ireland	141	135	-2	2%	-4%	8.961	3%
Czech Republic	110	134	+1	2%	22%	14.490	4%
Romania	132	126	-1	“5	-5%	16.490	5%
Serbia	46	118	+8	2%	157%	20.103	6%
Hungary	107	116	-1	2%	8%	17.017	5%
Others	876	1.030	-	15%	18%	74.819	21%
Total	6.041	6.653		100%	10%	353.469	100%

Source: analysis based on IMB database, Game changers: EY Attractiveness Survey Europe (2018). Retrieved from <https://www.ey.com/gl/en/issues/business-environment/ey-attractiveness-survey-europe-june-2018#section3> (November 5, 2018)

Based on the results of the survey on the activity of the European market of the audit and consulting company EY, in 2017 Serbia attracted a record number of foreign direct investments (FDI), thanks to which for the first time it was on the ranking list of the top 15 European countries by the number of FDI.³ Last year, Serbia managed to attract 118 FDI projects, 157 percent more than in 2016 (46 projects), enabling it to climb the European ranking list by eight places based on the number of FDI and take 14th position in 2017, as stated in the research “European Attractiveness Survey 2018“. Over the past year, there were 353,469 new job openings from the FDI in Europe, which is 19% higher than in the previous year, of which 20,103 job positions

³ Read more: <https://www.ey.com/gl/en/issues/business-environment/ey-attractiveness-survey-europe-june-2018#section3>, accessed 26.08.2018

were in the Republic of Serbia, which makes up 6% of the total newly opened job positions in Europe for 2017. The three most popular European countries that received half the FDI inflow in 2017 are Great Britain (1,205), Germany (1,124) and France (1,019). The results of the research indicate that the region of Central and Eastern Europe is the second most desirable region, according to the number of FDI in Europe. According to research, the digital economy is emerging as a key driver of future growth with 1,172 FDI projects. It is also stated that more than one-third (34%) of investors believe that in the coming years the digital economy will be the most important driver of economic growth in Europe and that it will occupy a significant part of the market.

When talking about companies operating on the territory of the Republic of Serbia, we must point out that NIS is the leader of sustainable development. The NIS Report on Sustainable Development for 2017, which is in line with the standards of the world's leading organization in the field of sustainable business, Global Reporting Initiative (GRI), was verified by the independent auditing company "Ernst & Young". The report focuses on the challenges of NIS business in 2017, as well as on key issues related to business activities and socially responsible projects of the company. Among other things, the Report states that in 2017, NIS significantly improved its financial results, thus achieving a net profit of 27 billion dinars, i.e. 80 percent more than in 2016. In addition, NIS has invested 26.5 billion dinars in the development of the company and consequently remained one of the leading domestic investors. In line with the Development Strategy until 2025, the priority of NIS in the following period will be the introduction of modern equipment and innovative technologies that will enable the company to retain the position of leader in the regional energy market.⁴

In addition, in 2017, NIS continued to implement numerous projects in the field of environmental protection and invested 479 million dinars for this purpose. Also, under the slogan "Future at Work", NIS carries out socially responsible projects in which more than 370 million dinars were invested in 2017. The company's priority in this area is to contribute to the social and economic development of the wider community, with particular attention to improving education, in order to create the best possible conditions for the future development of young people in Serbia. Also, NIS has devoted a great attention to the professional development of its employees, and only in 2017, 196 million dinars were invested in their training.

CONCLUSIONS AND RECOMMENDATIONS

The examples of projects financed by foreign direct investment are numerous, and they point to their indisputable role in achieving sustainable development, the creation of new business models and the introduction of production technologies that enable the employment of a greater number of people, production at lower costs while reducing environmental pressures.

After 2000, through the processes of privatization and restructuring of the economy, Serbia carried out significant reforms and also achieved certain macroeconomic stability (Stefanović, 2008). This has partially paved the way for foreign investors to invest in projects of importance for the economic development and sustainable development of the Serbian economy. This is also supported by the fact that the Serbian authorities intend to make the country part of the European Union. On March 1, 2013, Serbia became a candidate for EU membership, and thus committed itself to the implementation of a large number of standards and rules relating to life, work and business in the field of environmental protection, green economy and sustainable development. It is expected that the opening of Chapter 27, dedicated to the environment, will encourage greater investment in the environment and, consequently, development of the green economy. This will certainly contribute to the establishment of the Green Fund, which started operating in

⁴ Read more: <https://www.nis.eu/lat/wp-content/uploads/sites/2/2018/05/SR-za-web.pdf>

2017 (Službeni glasnik Republike Srbije, 91/2016), from which the projects for environmental protection will be financed with funds provided by the polluters (Mladenović, Arsić, 2017).

However, in order for all this to be implemented in practice, the political will is indispensable, which in Serbia undoubtedly exists. In order to attract investors, it is necessary to create favorable conditions for sustainable flows of foreign direct investments that will meet the investment needs in the future. As governments and the private sector increasingly share this view, they will hopefully muster political will and find the appropriate venue to put an international support program for sustainable investment facilitation in place (Sauvant, Hamdani, 2015). The positive effects of the reforms implemented in line with EU directives, as well as the goals of the UN for sustainable development, have already begun to be visible. Over the past year, Serbia has attracted a record number of foreign direct investments, thanks to which for the first time it was ranked as 15th among European countries by the number of FDI, according to the survey results on the activity of the European market of the auditing and consulting company EY. Based on the fact that in Serbia during 2017, thanks to foreign direct investments, over 20,000 new job positions have been opened, as well as everything stated in the paper, we can conclude that the key hypothesis of the research has been proved - the investments are one of the basic tools for achieving sustainable development, especially in developing countries, such as the Republic of Serbia. Bearing in mind the benefits of such investments, investment in sustainable development can only be viewed as long-term savings versus the cost, which is the suggestion of the author for further research in this field. Investing in sustainable development paves the way for a better future for all of us, our future and the future of our children and thus we have to take good care of it.

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CREDIT GROWTH IN POST-CRISIS RECOVERY: EMPIRICAL EVIDENCE FROM THE WESTERN BALKAN COUNTRIES

Nevena Veselinović¹, Ljubivoje Radonjić²

Abstract: Numerous empirical tests have been confirmed the importance of the financial sector in generating real economic growth. The reasoning for existence of financial sector development influence on economic growth is simplistic – financial sector uses real assets and therefore affects real economy. Global financial crisis (2007-2008) has led transition countries into recession. The bank credit crunch following the financial crisis may constitute the main constraining factor for real economic activity. Determining the direction of the relationship between the two sectors of the economy is important for the foundation of necessary economic policy. There is a rich body of literature on the theoretical and empirical relationship between financial development and economic growth. The presence of this relationship, as well as its direction, has long been a debated topic among economists. According to the literature, financial development supports economic growth particularly in low and middle income countries. Western Balkan countries have been characterized mostly as low income countries, developing economies with relatively low level of openness to world markets, with a stable banking system. In this paper we attempt to identify the effects of credit activity on economic recovery, with a special reference on domestic banking system. In this regard, we investigate the role of bank credit activity in financing the economic growth of the Western Balkan region including Albania, Bosnia and Herzegovina, FYR of Macedonia, Montenegro, and Serbia in the years 2007-2017. More specifically, the paper analyzes the level of lending activity in relation to GDP growth in observed economies, during and after the economic crisis. The main aim of the research is to identify the importance of credit growth in the conditions of the post-crisis period. The paper deepens literature about the financial intermediation influence on economic growth, pointing out significant degree of causative consequential connection between financial sector and economic results. According to that, our hypothesis starts from the view that economic growth is in strong correlation with the level of credit activity, and vice versa. More precisely, the paper starts from the view that the credit activity follows the level of economic growth, but it is also an important incentive factor for economic development. In this sense, the main goal in this work is to point out the specific connection between the financial and economic aspects in the post-crisis recovery, in particular in the conditions of the countries of the Western Balkans.

Keywords: Western Balkans, Economic Crisis, Credit Growth, Banking System

JEL Classification: E 44, G 21, P 52

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INTRODUCTION

Global financial crisis (2007-2008) has led transition countries into recession. The economic model of the recovery process in the Western Balkans is highly challenged. One of the leading roles of the development process should be entrusted to the financial sector. Finance is a vital ingredient for economic growth. It became more evident that the consequences of excessively risky credit supply can not only contribute to the possible collapse of some banking and other financial institutions, but also affect the process of financing the other economic sectors that contribute to economic growth. Both economic practice and economic theory are interested in analyzing the role of financial sector in promoting the economic development and economic growth. Commercial banks are the most important financial institutions in bank-based economies such as the Western Balkan countries.

In earliest economic theories of economic cycles the emphasis was given to the positive effect of credit expansion on economic growth. The activity of banking industry has procyclical character in lending function and supporting the economic growth and development. Usual financial crisis implicate the changes of assets prices, volume of bank credit activities, high rate of non-performed banking loans, government intervention in financial sector and increase of level of systematic risk (Ercegovic, 2017). Impairment of credit quality of debtors, decrease of interest rates, deflation and reduction of investment activities caused banking industry to reduce the loan supply which enhanced the negative indicators of national economy (Rusek, 2014).

The crisis originated in the developed markets spilled over in the last quarter of 2008 to the countries of Western Balkan region. The Western Balkan countries are significantly exposed to the effects of global crisis because most of them are highly indebted abroad, possess insufficient hard currency reserves and experience high balance of payments deficits. Global financial crisis implication on Western Balkan countries banking sector resulted with sudden deposits outflow, investor's confidence decrease, cost of capital increase and credit quality deterioration. Global economic crisis also caused a decline in potential GDP due to a strong contraction in demand which is difficult problem in demand-driven small open economies, such as the Western Balkan countries.

Referring to the historic background and the transformations suffered, the Western Balkan countries have developed bank based financial structure so the soundness of the banking sector is significantly important for the stability and progress of their economies on the long run. Banking sector occupies the major part of total assets of their financial sector which is directly or indirectly affected by the financial shocks of the last years. Any disturbance, interference or irregularities in the banking sector is mainly reflected to the real economy if considering the bank based financial structure of Western Balkan countries and the strong relationship between the banking sector and the financial system. The improvements on the banking sector efficiency and performance will accelerate their economic recovery.

Banking sector transformation was an important element in the overall transition process. Process of transformation of banking sectors in Western Balkan countries went through similar phases during 2000s. Characteristics of the first phase is that the biggest part of credits issued by the banks was used for financing public companies, which would be dismissed, scrapped out or country would take care of returning it. The second phase is characterized by privatizing and selling banks, mostly to foreign investors. In the third phase banks started standard operations of buying and selling securities and issuing loans for the private sector. Speed of the process of transforming and reforming banking sectors is different from individual country to country, but major number of countries went through these phases.

Despite the fact that credit growth can encourage economic growth, rapid credit growth in some cases precedes the occurrence of a banking crisis. A financial accelerator amplifies the initial

effects of any shock (financial or real) on economic activity. The three main channels through which shocks affect the business cycle are: 1) bank credit, 2) the balance sheet and 3) a liquidity. The third one has become increasingly important since the financial crisis and emphasis the importance of bank's liquidity, which is necessary to extend credit and consequently accelerate economic activity (Basel Committee on Banking Supervision, 2011).

LITERATURE REVIEW

The main function of banks in economic sense is to facilitate operation of fund lending as much as possible in order to increase investments in economy. Development of a country depends on increasing investments. Banks assume an important intermediary role in providing increase of investments. When banks contract credits that they let use, they can cause economic stagnation and for some sectors to go through a difficult period.

Banks can also ensure effective distribution of resources in economy by transferring resources that they have collected to certain regions and sectors in need. Some authors evaluate whether the level of development in the banking sector exerts a causal impact on economic growth and its sources. Their paper's results support the view that „Better functioning banks improve resource allocation and accelerate total factor productivity growth with positive repercussions for long-run economic growth” (Beck, Levine, & Loayza, 2000). Beck and Levine (2002) investigate the impact of stock markets and banks on economic growth and they find positive impact of stock market development and bank development on economic growth.

Empirical evidence suggests that real activity, the volume of bank lending activity, and the volume of trading in equity markets are strongly positively correlated. Durusu-Ciftci, Ispir and Yetkiner (2017) showed that debt from credit markets and equity from stock markets are two long run determinants of GDP per capita and they showed that by fostering the development of a country's financial sector, economic growth will be accelerated. Some papers archive significant impact of bank stability on the economic growth and inflation (Monnin & Jokipii, 2010). Empirical evidence also suggests that inflation and financial market activity are strongly negative correlated as are inflation and the real rate of return on equity in the long run. Inflation and real activity are also negatively correlated in the long run, particularly for economies with relatively high rates of inflation. Huybens and Smith (1999) presented a monetary growth model in which banks and secondary capital markets play a crucial allocative function. They showed that the predictions of the model are consistent with these observations about inflation, finance and long-run real activity.

Financial crises of last years have led to the need of scientific researches of the factors causing them in modern economy, and investigation of main economic indicators, the institutional environment and financial sector interrelation. Effective activity of banking system catalyzes general development of national economy. Being an integral part of market infrastructure, the banking system is in bilateral connection with real sector. And all changes in real sector anyway affect whole banking system (Larionova & Varlamova, 2014).

The recent global economic recession (2007-2008) highlights the need for economists and policy makers to question the optimal size of financial systems for sustainable economic growth. Study conducted by Law and Singh (2014) provided a new evidence on the relationship between finance and economic growth using an innovative dynamic panel threshold technique. They showed that the level of financial development is beneficial to growth only up to a certain threshold; beyond the threshold level further development of finance tends to adversely affect growth. “In terms of policy implications, policy makers could focus less on increasing the size of the financial sector and more on improving its intermediating function” (Law & Singh, 2014). Also, there is certain assume that financial market starts to influence on economic growth only

after achieving certain level of institutional development (Siong Hook Law, Azman-Saini, & Ibrahim, 2013).

Credit to the private sector has been grown very significantly in a number of transition countries in past two decades. Undoubtedly, rapid credit expansion has become a key topic for policy discussion in the Western Balkans. On the one hand, rapid credit growth can be justified by the very low initial level of intermediation in these countries and the convergence towards levels observed in developed EU countries. On the other hand, both empirical and theoretical arguments imply that too rapid credit growth, also known as credit boom, can have serious macroeconomic consequences, especially if it is connected with sizable external imbalances and high level of dependence on global impacts which can also be observed in many of transition systems (Kiss, Nagy, & Vonnák, 2006). It is clear that the rapid credit growth has been one of the main drivers of growth in the region in recent years as it has boosted both domestic consumption and investment.

Consequently, many of the transition countries faced with serious economic and credit contractions caused by the global economic crises. In this paper, we investigate macroeconomic conditions and banking sector indicators of the selected economies in the past fifteen years. More specifically, the main consideration of our analyses is to identify the equilibrium credit/GDP levels of the Western Balkans countries during and after economic crises.

METHODOLOGY

The article considers economic stagnation and bank channels possibilities for recovery perspectives of the Western Balkan countries during the last decade using statistical macroeconomic analysis. In order to accomplish the aim of this survey a set of data was collected and interpreted. For the purpose of comparative analysis of the credit activity in the observed countries, we used the data obtained by the supranational methodology of the World Bank and IMF. The main research period for the data collected covers the years 2007-2017. We monitor the credit indicators as percentage of GDP in selected countries and by the method of descriptive statistics point to the significance of the banking sector in financing economic growth. We also represent the annual growth of net domestic credit in Western Balkans.

RESULTS AND DISCUSSION

Completion of economic and institutional transition through structural reforms, adoption of the EU acquis, catching up process to higher per capita income levels, reduction of unemployment, poverty and inequalities, infrastructure modernization and future successful integration into the European Union are going to be a real test for the region given current circumstances and global instabilities (Berthomieu, Cingolani, & Ri, 2016).

Additional impacts of the global financial and economic crisis on the Western Balkans are reported through two main channels – a drop in export demand in foreign (mainly EU) markets and the abrupt reduction in foreign capital inflows. Deficit in revenues, as well as in the inflows of foreign capital, on the top of that had a negative consequences on economic recovery in these countries. The key macroeconomic circumstances of the Western Balkans, as well as their sensitivity to global tendencies, are best seen through the economic growth trajectory. Figure 1 shows the real GDP growth of the observed countries over the last decade.

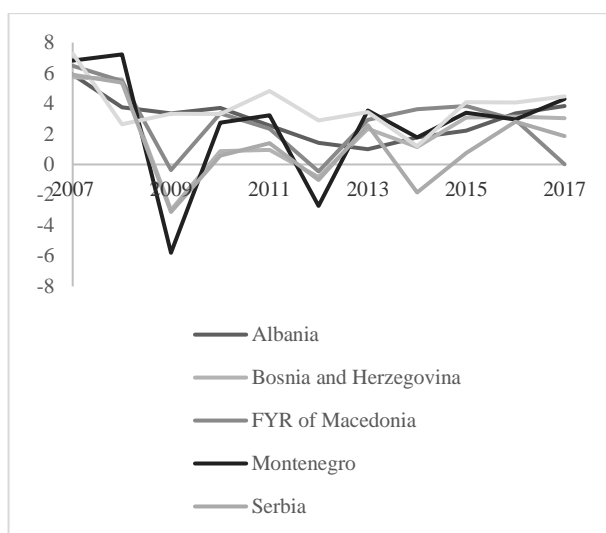
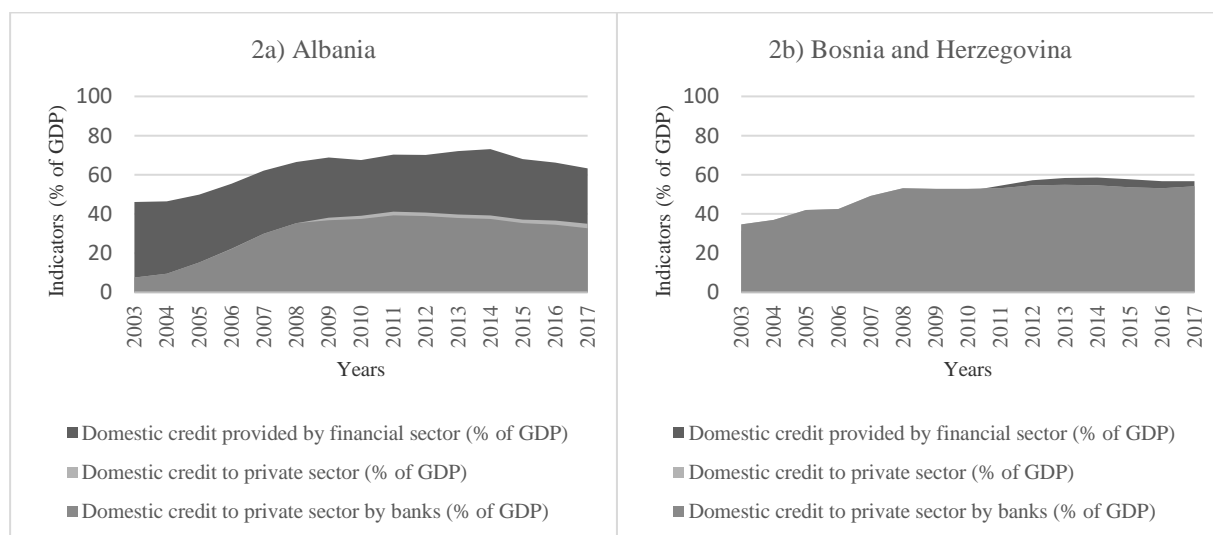


Figure 1: Real GDP growth (%)

Source: Authors, according to data from World Bank dataset (Data Bank, 2018)

Figure 1 shows the percentage increase of GDP in the countries of the Western Balkans. It is indicative that the trajectory of economic growth is very variable in the observed ten-year period. After accelerating in 2007 to an average pace of 6.3% of GDP, growth in the Western Balkans declined in the second half of 2008. Economic activity was driven by strong domestic demand and fuelled by credit and wage growth. In contrast, the contribution of net export to GDP growth remained negative in all countries of the region. Represented data indicate that growth continued after 2009, but at more moderate levels.

The next point of research deals with the significance of financial sector in the analyzed economies. Figure 2 shows a very high level of convergence between total domestic credit to private sector as percentage of GDP and domestic credit to private sector provided by banks, also presented as percentage of GDP.



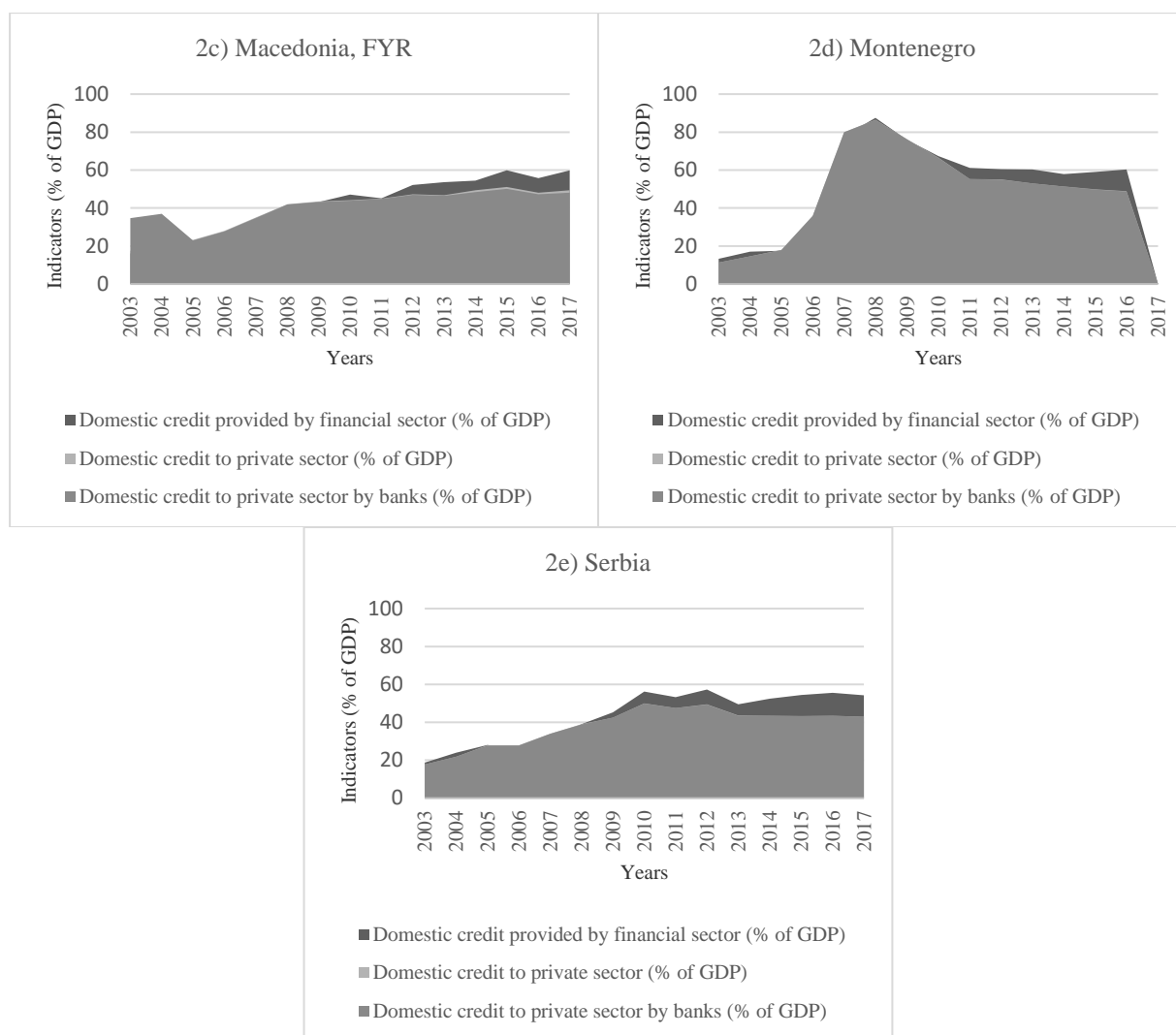


Figure 2: Domestic credit provided by financial sector, Domestic credit to private sector and Domestic credit to private sector by banks, all presented as percentage of GDP, 2003-2017. Source: Authors, according to data from World Bank database (Data Bank, 2018)

The financial systems in transitional Western Balkan countries are based on banks – approximately 85% of total assets of financial sector are accounted to bank assets, whereby the capital markets are generally underdeveloped (Égert, , Backé, & Zumer, T., 2006). Banking sector, as the Figure 2 shows, is the most important channel of financial intermediation in the case of Bosnia and Herzegovina, FYR of Macedonia, Montenegro, and Serbia. In Albania after the financial crisis the economy started to slowdown and the banks, while facing a rise in Non-Performing Loans, started to cut out lending. This lead to a situation today when banks are holding excessive quantities of deposits and in the same time the lending is low (Musta, 2016).

Credit policy, as well as monetary policy, represents a very important instrument of economic policy to achieve macroeconomic objectives. Figure 3 shows annual growth of net domestic credit represented in current LCU, between 2007 and 2017. This figure also indicates the level of demand for bank’s loans by the private sector, the level of credit activity as the cause of the demand and the final real growth of gross domestic product in the period from 2007 to 2017.

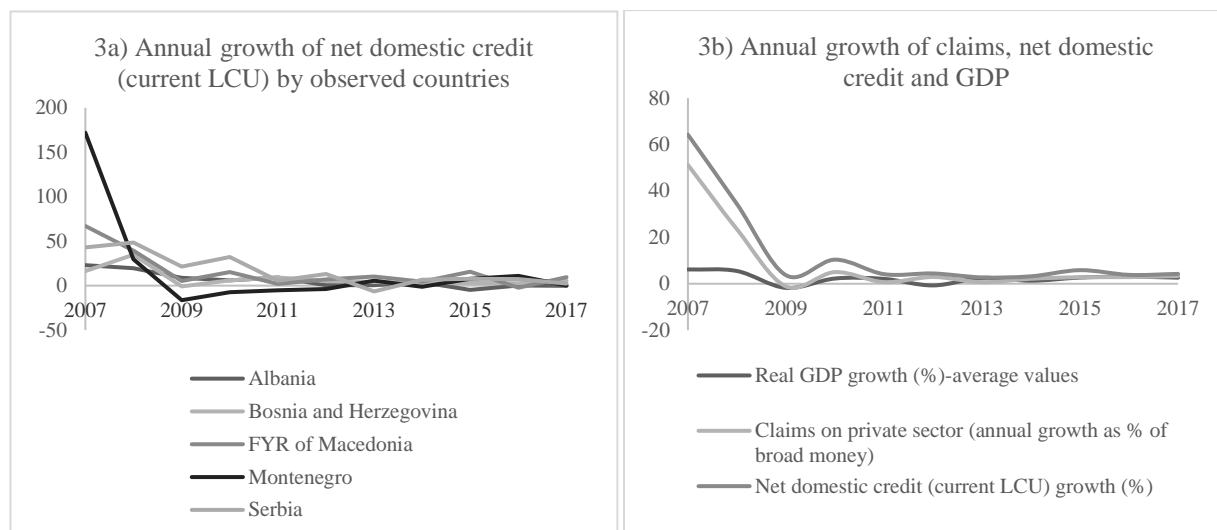


Figure 3: Annual growth of net domestic credit (current LCU) by observed countries and Annual growth of claims, net domestic credit and GDP, 2007-2017.

Source: Authors, according to data from IMF database (International Financial Statistics, 2018) and World Bank database (Data Bank, 2018)

The previous figure indicates the decline in net credit activity in the post-crisis period in 2008, while the observed indicator in the next ten-year period marks a modest growth in all countries of the Western Balkans (Figure 3a). The largest decline in credit activity is recorded by Montenegro while other countries record relatively moderate recessionary stages of credit activity in the crisis. The right side of Figure 3 indicates a fair convergence in the movement of net domestic lending and private sector credit to financial institutions in the observed countries. The high level of credit activity and private sector credit demand decline is noticeable in the period of the 2008-2009 crisis, but the level of lending activity does not change significantly in the next ten year (Figure 3b). It is important to note that the lines of the movement of net credit growth, private sector credit and GDP growth are almost overlapping, which can indicate an important correlation of the observed variables. With respect to the economic impact of the crisis on the Balkan countries, it must be said that the crisis here follows the general European and global trends, but with a certain time lag (of about a year) behind the development of the crisis in the EU.

CONCLUSIONS

Observed through growth rates, there is a strong match between the trajectory of credit and economic growth in the countries of the region of the Western Balkans, without concrete investigation of the cause-effect relationship between these variables.

It is also noticeable that during the entire period after the crisis, a much lower level of economic growth was recorded compared to pre-crisis rates in 2008. Following the discussion of banking sector and macroeconomic causes, the descriptive statistics can confirm that there are still a huge possibilities for economic growth with financial and more specifically banking sector origins. It is clear that the banking system will play an important role in the future in providing incentives for economic growth and development.

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ECONOMIC POLICY IN THE FUNCTION OF ECONOMIC DEVELOPMENT OF THE REPUBLIC OF SERBIA

Miloš Dimitrijević¹

Abstract: *Since economic policy has changed its direction and course of action, from the functioning of market mechanisms and rules to the introduction of regulatory policy, discretion and the state as the main carrier of economic policy, various economic and development schools have been developed and changed. The turning point in the functioning of economic policy as well as the replacement of economic schools was mainly related to the appearance of various economic crises that have affected economic development. Thus, the appearance of the recent economic crisis again revived the important role of the state and regulatory policy in the implementation of economic policy. The basis of economic policy is becoming a fiscal policy and its instruments that affect economic development. Special attention is dedicated to changes in fiscal indicators, public debt and budget deficit. No less important are monetary indicators that are also taken into account, with regard to price stability and exchange rate fluctuations. Also, relations with foreign countries, i.e. payments and trade balances must be taken into account when discussing about economic policy. On the other side, a responsible economic policy needs to achieve certain goals and economic development. For indicators of economic development were used indicators of economic growth, changes in GDP and GDP per capita, unemployment rate and the Human Development Index as a wider measure of sustainable development. Using the multivariate linear regression, the effect of economic policy on the indicators of economic development is determined. In this way, the relationship between the indicators of economic policy and economic development in the Republic of Serbia in the period 2008-2016 is examined, with special emphasis on the economic crisis and the economic policy after it. The paper also presents the importance of conducting a responsible economic policy in order to bring the observed indicators to acceptable reference values. The aim of the research is to demonstrate the effect of economic policy on overcoming the negative impact of the global economic crisis in Serbia and creating economic development, where key elements of fiscal and monetary policy measures taken as well as foreign operations and their direct linkage and activity to indicators of economic development. Unlike the indicators in which a positive change is observed from year to year in the observed period, such as a fall in inflation and an increase in the trade and balance of payments, public debt has recorded growth, which rightfully this period is also characterized as a crisis of public debt. Bearing in mind that unemployment and inflation in the observed period were not related and that inflation recorded a positive trend, it was necessary to reduce unemployment to the natural one, but also to achieve appropriate GDP growth rates so that unemployment would not increase. In addition to all indicators that do not lag behind much on benchmarks or show improvement from year to year, the effects of economic policy are omitted on economic activity and employment, which is why the choice between rules and discretion is the current one.*

Keywords: *economic policy, economic development, global economic crisis*

JEL Classification: *E63, O11*

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INTRODUCTION

Different schools of economic thinking were also changed in the course of various crises. Thus, in the 1930s, active role was given to the state in managing aggregate demand, up to the seventies, and the emergence of stagflation, when market mechanisms again gained significance. While with the onset of the global economic crisis in 2007 again the state enters the scene and its regulatory role.

The global economic crisis (2007-2009), triggered by the financial crisis and economic recession in the US, officially in december 2007, as a single economic event that can not be attributed to a standard cyclical decline in economic activity, has led to significant changes in the goals and instruments of economic policy (Praščević, 2012: 626). The financial crisis has spread very rapidly to the real sector, but also created the current crisis of public finances today.

After decennial domination of the rules governing economic policy and the primary goal of price stability, relying on monetary policy, the need to mitigate and rapidly overcome the economic crisis imposed discretion in the conduct of economic policy, and in particular fiscal policy (Spilimbergo et al. 2008).

State interventionism, imposed even in traditionally highly neoliberal economies as an instrument that was supposed to solve the problems that had arisen, took on various forms and was practiced on a different scale (Claessens et al. 2013, Allen et al. 2015, Caprio et al. 2014, Taylor, 2009).

In a modern economy that is burdened with a number of problems, starting from high unemployment that has been singled out as a key economic problem to inflationary pressures, public debt, budget deficits and others, which has an impact on economic growth and development and the growing spread and increase of social inequality, great attention is paid to the interaction of monetary and fiscal policy. Also, business with foreign countries as part of economic policy takes a significant place in solving the problems of today, which are particularly pronounced in Serbia and where responsible economic policy takes great care.

Bearing in mind this relation, *the subject of work* is the identification of the relationship between the indicators of economic policy and economic development in the Republic of Serbia in the period 2008-2016. In this context, *the main goal of the work* will be focused on the effects of economic policy in order to overcome the negative impact of the global economic crisis (2007-2009) in Serbia and the creation of economic development. This paper examines the key elements of the measures undertaken for fiscal and monetary policy as well as foreign operations.

In accordance with the subject and purpose of the research, the basic assumption from which the work begins is:

X1: Effects of economic policy in the Republic of Serbia taken to overcome the global economic crisis affect the overall economic development.

LITERATURE REVIEW

Different factors are encountered in economic literature as the causes of disagreement among economists. However, all the causes can be reduced to different perceptions:

a) *characteristics and method of functioning of the economy*, and on the basis of this different b) *recommendations of economic policy* (Stanković, 2006: 9).

The idea that monetary and fiscal policy measures can be used to control aggregate demand in the economy and should even be used is due to the experience of the great depression of the thirties of the twentieth century (Kuper&Kuper, 2009: 741).

Inadequate implementation of economic policy and coordination of fiscal and monetary policy led to imbalances in public finances, external indebtedness, as well as high unemployment and insufficient economic growth as burning problems in Serbia.

The effectiveness of the market is very difficult to achieve because of asymmetric and insider information, as well as due to errors in forecasts and unanticipated policies (Stiglic, 2013), and, on the other hand, due to the activities of foreign companies that reduce their state intervention by their influence (Poynter, 1982). In addition, there is a growing influence of large multinational companies and banks on government policy in the fiscal and monetary sphere (Lazonick, 2014, Hamilton & Hepburn, 2017). That is why a state is needed, which will take care of all citizens with its economic policy measures (Bryne & Ruane, 2017, Mishra, 2014).

Numerous authors deal with their analysis by connecting economic growth with fiscal policy, but also with measures that should mitigate specific economic difficulties such as unemployment, retirement, insurance in the event of an accident or illness (Moreno-Dodson, 2013, Rimlninger, 1971). The connect between macroeconomic indicators and economic growth was then explored (Fischer, 1993), which came to the conclusion that growth is negatively connected to inflation and is positively related to good fiscal performance and secured foreign exchange markets.

Authors who have dealt with modern economic growth theories explore a variety of opportunities and goals in the context of a growing economy (Barro & Sala-Martin, 2004, Acemoglu, 2006, Solow, 1956, Harrison, 1996, Howitt&Aghion, 2009, Jones,1990, Yifu Lin, 2012, Lucas, 1990). Economic growth implies higher value of production and services in the observed time interval compared to any other earlier period, while economic development does not only mean the growth of the real value of production, which can be achieved by increased use of inputs or by the greater efficiency of their use, but also by numerous structural, and technological changes as well as raising the standard of living of the population, i.e. improving the quality of people's lives (Rosić et al. 1998: 122).

Economic development should provide new opportunities for the production and distribution of goods that meet the needs of the population, to increase the standard of living, including high incomes, low unemployment, increasing the level of education, and providing economic and social opportunities for individuals and national economies further improve and build a stable basis for future economic growth and development. However, in meeting the needs of the population and adapting to new circumstances, the concept of sustainability comes to the forefront (Đorđević, 2009: 34).

The state does not intervene in the economy only through monetary policy, through the central bank, but primarily by fiscal policy, through the government or the ministry of finance. Today these two institutions are mutually independent, but they are directed to cooperation and coordination of their policies. However, each of these institutions has its own independent goals. The central bank is responsible for the absence of inflation on the market, and the government to does not have unemployment and falling living standards. As these goals are difficult to achieve at the same time, there are frequent situations in which there is no complete harmonization of monetary and fiscal policy (Vukadin&Labus, 2012: 160-161).

That is why coordination of fiscal and monetary policy is of great importance in order to create macroeconomic stability, and hence economic and sustainable development.

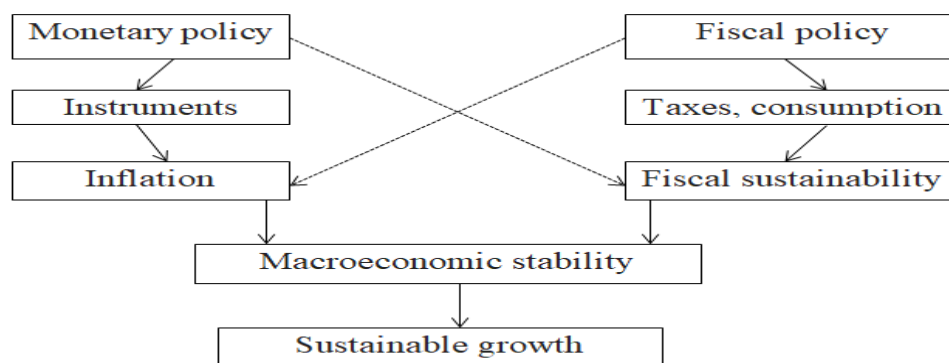


Figure 1: Interaction of policies and impact on sustainable growth

Source: Kvrđić, G., Čolić, Z., Vujović, T. (2011), Importance of coordination of the monetary and fiscal policies measures, *Bankarstvo*, 3-4: 41, UBS, (08.06.2018.), http://www.ubs-asb.com/Portals/0/Casopis/2011/3_4/B03-04-2011-Kvrđic-Colic-Vujovic.pdf

When talking about economic policy, in addition to all this, we must also observe international business. New growth theories do not predict that trade will undoubtedly increase economic growth. (Harrison, 1996: 420). Therefore, we must observe the economic policy both within the country and in the business outside the national borders, because one can not achieve satisfactory results without another.

From this we conclude that exclusively fiscal and monetary policy, without reviving economic growth and improving foreign trade, which will lead to employment growth, we can not talk about economic development, especially in view of the global economic crisis, which significantly influenced the economy of Serbia. The slowdown in the global economy, the problems of the financial sector and the functioning of the financial system, which significantly hampered global lending and reduced liquidity, have had negative effects on the economies of emerging markets and transition economies, including the Serbian economy. The beginning of the crisis in Serbia began in the last quarter of 2008. A significant slowdown in economic activity was recorded in the second half of 2008, but the strongest impact of the crisis on Serbia's economy was recorded in 2009 (Praščević, 2013: 18).

Although the first signs of the recovery of the world economy were registered at the end of 2009, this still does not mean that the world has escaped the crisis. And even when the world economy returns to a rally, the key question remains whether there is a risk of the emergence of a new crisis (Kovačević, 2010: 626).

METHODOLOGY

To examine the functioning of economic policy and its indicators (budget deficit, public debt, inflation, exchange rate, payment and trade balance) on the economic development indicators (GDP, GDP per capita, unemployment and HDI) was used univariate and multivariate linear regression. Regarding the indicators of sustainable development in addition to GDP per capita and unemployment, we need a measure that will express sustainability of development. The United Nations Development Program (UNDP) has designed a broader measure that includes education, health and income (Stiglic: 2013), it's Human Development Index.

Secondary sources of data were used as data source: Trading Economics, World Bank, UnctadStat and UNDP. On the basis of the collected data from the mentioned databases, research was carried out on the territory of the Republic of Serbia in the period 2008-2016. years. These data are further observed in relation to their optimal values and criteria of convergence in the European Union, as a benchmark for the development of the economy.

In order to examine the relationship between economic policy and economic development, this study used linear regression. The univariate regression was aimed at determining whether there is individual effect of each of the selected economic policy indicators on the indicators of economic development, while the multivariate linear regression determines the cooperation of all selected economic policy indicators on the indicators of economic development. The goal of regression analysis is to determine the regression model that best describes the relationship between appearance and that based on this model estimates and predicted values of the dependent variable Y for selected values of explanatory variables X (Lovrić, 2009: 335). In this paper, economic development indicators are regarded as dependent variables, and economic policy indicators are regarded as values of explanatory variables (independent variables). The selected analysis techniques were conditioned by the numerical nature of the independent and dependent variables, that is, the fact that all the analyzed variables are time series which can be defined as a series of consecutive observations arranged according to the time parameter (Granger & Newbold, 1986: 1).

When researching interconnections of two variables, simple regression and correlation analysis are applied, and in the case of observing multiple variables, multiple regression and correlation methods (Lovrić, 2009: 335). "If the dependence of one phenomenon of two or more independent phenomena is examined, then it is a multiple regression" (Stojković, 2001: 823). Multiple regression analysis is more amenable to *ceteris paribus* analysis because it allows us to explicitly control for many other factors that simultaneously affect the dependent variable. This is important both for testing economic theories and for evaluating policy effects when we must rely on nonexperimental data (Wooldridge, 2013: 68), as in this paper. Multivariate statistical analysis has provided powerful techniques that enabled researchers to detect patterns of behavior in the interaction of a large number of variables, patterns that would otherwise be hidden or barely noticeable. In addition, most of the technique is precise enough that with the help of statistical significance test determines whether a certain interdependence really matter or is the result of fluctuations in the sample data (Hanke et al. 2001: 4, Hansen, 2017).

The task of statistics is to find the best level equation, that is, the one that has the least amount of deviation in relation to all empirical data. This level is called the regression level of the cause and its equation is (Lovrić, 2009: 393, Wooldridge, 2013: 73):

$$\hat{Y}_i = b_0 + b_1x_{1i} + b_2x_{2i} + \dots + b_kx_{ki}, \quad (1)$$

Where is: \hat{Y}_i is the adjusted or predicted value of the dependent variable Y_i , and b_0, b_1, b_2 and b_k are estimates of unknown parameters $\beta_0, \beta_1, \beta_2$ и β_k .

The second part of the analysis was to determine the change in the indicators of economic policy and economic development by years, the impact of the economic crisis and its consequences on the mentioned indicators and the observation of the trend of changes in the observed time interval 2008-2016. This would further serve to see how much the observed indicators were affected by the crisis and far from some reference values for which Student's t test and descriptive statistics were used to arrive at valid conclusions. Test statistics are the criteria on the basis of which we are testing (Lovrić, 2009: 215). The student's test by which the arithmetic meanings of two sets are compared is one of the most important and in the practice of the most frequently used tests (Lovrić, 2009: 237).

Finally, knowing that the effects of economic policy were absent on economic activity and employment, based on the inverse relationship between unemployment and inflation according to the Philips curve, Spirman's correlation coefficient (Pallant, 2011) was used to make this relationship, which also examined on the case of Serbia and gave the right conclusions about reducing unemployment and maintaining inflation at the target rates.

RESULTS AND DISCUSSION

The results of the research will be presented within the last segment, the performance of economic policy indicators on the indicators of economic development.

Table 1. Effects of economic policy on economic development

	depen dent	GDP		GDP per capita		Unemployment		HDI	
independent	linear reg.	Uni. reg.	Mul. reg.	Uni. reg.	Mul. reg.	Uni. reg.	Mul. reg.	Uni. reg.	Mul. reg.
Public debt	b	-0.016	-0.0293	-0.015	-0.0299	0.044	0.258	-0.005	0.009
	Std error	0.057	0.102	0.057	0.101	0.077	0.027	0.005	0.019
	Sig.	0.781	0.035	0.795	0.032	0.583	0.003	0.324	0.673
Government budget	b	0.705	0.385	0.705	0.377	-1.394	-0.651	-0.086	- 0.089
	Std error	0.419	0.228	0.426	0.226	0.439	0.121	0.036	0.029
	Sig.	0.136	0.167	0.142	0.171	0.016	0.013	0.051	0.022
Inflation rate	b	0.186	-0.168	0.193	0.233	0.106	1.395	0.028	0.011
	Std error	0.228	0.386	0.230	0.367	0.327	0.135	0.021	0.071
	Sig.	0.442	0.706	0.430	0.590	0.755	0.002	0.214	0.887
Exchange rate	b	0.285	-0.108	0.292	-0.106	-0.317	-0.440	0.001	0.006
	Std error	0.206	0.130	0.208	0.130	0.298	0.059	0.023	0.015
	Sig.	0.208	0.466	0.202	0.473	0.323	0.005	0.962	0.719
Balance of payment	b	-0.269	-0.836	-0.270	-0.851	0.134	0.254	-0.016	0.010
	Std error	0.173	0.173	0.176	0.171	0.273	0.071	0.019	0.027
	Sig.	0.165	0.005	0.169	0.004	0.638	0.037	0.428	0.721
Trade balance	b	-0.014	0.716	-0.012	0.732	0.056	-0.071	-0.011	- 0.012
	Std error	0.089	0.191	0.090	0.189	0.122	0.127	0.008	0.005
	Sig.	0.882	0.013	0.898	0.012	0.657	0.634	0.196	0.066

Source: The author

Univariate linear regression does not show that the annual growth of GDP, GDP per capita and HDI are dependent of any of the six economic policy parameters examined, while it shows that unemployment depends only of the budget deficit ($p = 0.016$).

However, the multivariate linear regression (when examining the simultaneous impact of all parameters, ie their cooperation) shows that the annual GDP growth depends of the public debt ($p = 0.035$), from the balance of payments ($p = 0.005$) and the trade balance ($p = 0.013$), where is $R^2 = 0.830$. Similar situation is with annual growth of GDP per capita, which also depends of public debt ($p = 0.032$), balance of payments ($p = 0.004$) and trade balance ($p = 0.012$), where is $R^2 = 0.838$. A somewhat different situation is with unemployment, which depends from the public debt ($p = 0.003$), budget deficit ($p = 0.013$), inflation rate ($p = 0.002$), real effective exchange rate ($p = 0.005$) and balance of payments ($p = 0.037$), where is $R^2 = 0.991$; as well as HDI, which depends of the budget deficit ($p = 0.022$), and the trade balance ($p = 0.066$) is indicative, with $R^2 = 0.697$.

Equations of regression levels lie between points representing empirical data of samples and of all possible levels having the smallest sum of squares of vertical deviations:

annual GDP growth = - 0.293 • public debt – 0.836 • balance of payments + 0.716 • trade balance+36.508,

GDP growth per capita = - 0.299 • public debt – 0.851 • balance of payments + 0.732 • trade balance+37.770,

unemployment = 0.258 • public debt – 0.651 • government debt + 1.395 • inflation rate – 0.440 • real effective exchange rate + 0.254 • balance of payments + 47.018,

HDI = - 0.089 • government budget – 0.012 • trade balance – 0.073.

This is once again proven that when we talk about economic policy, we can not specifically talk about fiscal, especially monetary, and especially to observe foreign operations, because, on the contrary, when all the indicators are considered together and economic policy as consistent, that can notice the functioning of economic policy and its parameters on economic development, which further means that with the help of parameters of economic policy we can calculate the desired parameters of economic development and thus influence its creation.

In the second part of the analysis were drawn conclusions that the economic crisis has left the greatest impact on the public debt of the Republic of Serbia, which is dependent of the observed years ($p < 0.0005$), ie. it is in the interval from 2008-2016. recorded an average increase of 6.192%. Public debt growth was finally stopped in 2016.

The inflation rate also recorded a trend in the observed period and depended from the observed years ($p = 0.004$). From 2008-2016. the inflation rate drops to an average of -1.282%. Positive changes were also recorded in the balance of payments, which in the observed period grew on average 1.238% ($p = 0.038$), as well as in the trade, which registered an average increase of 3.907% ($p < 0.0005$). Unlike from these parameters, budget deficit, real effective exchange rate, annual GDP growth and GDP per capita, as well as HDI and unemployment are not dependent of observed years and do not record such a trend of change. However, in spite of that, the economic crisis had the biggest impact in the years after the outbreak on the decline in GDP, the rise in unemployment and the budget deficit. Although these parameters have improved in recent years, they are still not on the level before the outbreak of the crisis, except for the budget deficit. Also, payment and trade balances, although recorded significant improvements, are still in deficit.

Non-accelerating inflation rate of unemployment (NAIRU) is somewhat unwieldy acronym stands for the employment rate that keeps inflation constant (non-accelerating) (Nolte, 2015: 289). The NAIRU is approximately a synonym for the natural rate of unemployment (Ball&Mankiw, 2002: 115). The current NAIRU is assumed to be around 6% and the target inflation rate is around 2% (Nolte, 2015: 292). This is also important because of GDP growth, knowing that unemployment would not increase, with a growth in the workforce at a normal rate and productivity growth at a normal rate of 2% to 3%, GDP must grow at a rate of 3% to 4% (Stiglic, 2013: 93). Targeted inflation pathways reflect the intention to achieve price stability without causing macroeconomic disturbances. Targeted inflation in 2017. and 2018. will continue to be above the level of quantitative definition of price stability and the level of targeted inflation in developed countries (2.0% or 2.5%). The targeted inflation supports nominal, realistic and structural convergence towards the European Union (Izvršni odbor NBS, 2015). When it comes to convergence criteria, it is important to mention the Maastricht according to which the budget deficit should not exceed 3% of GDP, and the public debt should not exceed 60% of GDP (Marković&Furtula, 2010: 26).

By comparison with the exposed reference and optimal values based on the criteria of convergence in the European Union, as a benchmark of a developed economy and indicator values as indicators of development in the observed period 2008-2016. we can say that the public debt (average 53.46%) does not deviate statistically significantly from 60% (Marković&Furtula, 2010: 26), $p = 0.288$, as well as the budget deficit (average 3.63%), which does not deviate statistically significantly from 3% (Marković&Furtula, 2010: 26), $p = 0.365$. In contrast, GDP growth (average 0.83%) deviates statistically significantly from 3% (Stiglic, 2013: 93), $p = 0.037$. Also, inflation (average 6.38%) deviates statistically significantly from 2% (Izvršni odbor NBS, 2015), $p = 0.013$, and unemployment (average 18.94%) deviates statistically significantly from 6% (Nolte, 2015: 292), $p = 0.0005$.

Inflation and unemployment are often (but not always) linked by an inverse relationship in which government policy, that seeks to increase employment above its current demand, leads to higher inflation. This relationship is known as the Phillips curve (Nolte, 2015: 289). Inflation forecasts produced by the Phillips curve generally have been more accurate than forecasts based on other macroeconomic variables, including interest rates, money, and commodity prices (Ball&Mankiw, 2002: 121).

Inflation and unemployment in the observed period are far from the required level. Unlike unemployment, inflation has fallen and brought in recent years to the desired levels, while unemployment is still far from the natural level, not even at the pre-crisis level. Therefore, as well as a special place in economic policy that offers the choice between unemployment and inflation (Blanchard & Gali, 2007, Akerlof et al. 2000, Samuelson & Solow, 1960), although there is no reason to be connected with them in the long run (Friedman, 1968, Phelps, 1968), this relationship was investigated in Serbia in the observed period and with the help of Spirman's correlation coefficient drawn the conclusion that they were not connected together ($r = 0.075$, $p = 0.847$). This gives space for greater attention in the future to reduce unemployment, without fear that inflation will change. Likewise, while GDP reached a level of 2.80% in 2016. is still far from pre-crisis level (2008-5.37%), from which we conclude that the effects of economic policy are failed on unemployment and economic activity.

CONCLUSIONS AND RECOMMENDATIONS

The crisis has affected the deterioration of the current account balance, and some of the countries of Central and Eastern Europe have addressed the IMF for assistance in financing the balance of payments. With the deepening of the crisis, the emerging markets have been facing increasing difficulties with financing their debt to abroad (Praščević, 2012: 70). By strengthening the export offer and by reducing the import demand, an improvement in the balance of payments position of the countries in the coming period can be expected and the financing of the current account deficit without further borrowing (Janković&Stanišić, 2013).

It is therefore necessary to find new sources of growth that will represent growth on a stable basis. This growth would be based primarily on stimulation of exports, for which production is necessary, but also of equal importance and structural reform. Serbia needs special attention to focus on strengthening competitiveness, based on innovation and the connection between science and the economy. This would reduce unemployment and increase efficiency. Higher exports of more competitive goods and services lead to higher rates of economic growth and lower unemployment.

It is important to note that by means of regression and correlation we are not able to find out whether there is a cause and effect relationship between the phenomena in the sense that one phenomenon is the cause and the second consequence (Lovrić, 2009: 335), therefore it can serve

as a recommendation for further research, since the interconnection between economic policy and economic development is established.

The crisis of public debts did not bypass Serbia. The economic crisis has led to such a situation not only in our country but also in the whole world, which, from the financial crisis, has spread to the public sector through the real sector. However, in our country, public debt was close to the desired 70% (71.9%) in 2016, in contrast to the economic growth, which is at a lower level of growth and unemployment, which is quite high. Both indicators deviate statistically significantly from the required level. Therefore, special attention should be paid to these parameters of economic development. Bearing in mind that precisely on these two parameters, all selected indicators of economic policy have been operating, it can be concluded that only a consistent economic policy can act on the economic development of the Republic of Serbia.

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**ACCOUNTING AND
BUSINESS FINANCE**

THE (NO)ALIGNMENT OF COSTING AND ENTERPRISE MANAGEMENT CONCEPTS WITH LEAN BUSINESS CONCEPT

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Abstract: Management accounting provides the most important part of the information support for managing a modern company, based on customer requirements, business and financial goals of the company, internal processes and the need for continuous business improvement. In order management accounting to justify the epithet of the most important information source for efficient management, it is necessary to develop new and continuously enhance existing concepts of costing and cost management, to respond to the needs of enterprises wanting to maintain and improve their competitive advantage in the changing business environment. In that regard are developed and enhanced concepts of costing and cost managements and enterprises, such as, among others, activity based costing, target costing, management concept based on the theory of constraints. Most of these concepts have in focus certain phases of the product's life cycle in which it is possible to reduce costs and improve performances.

Full application of lean business concept began in the last decades of the 20th century. However, the earliest examples and postulates of lean business concept date back to 1855. Specifically, a weapons warehouse recorded a single piece flow. Since then, lean business concept has evolved and today represents the leading business paradigm of modern companies. Lean business concept includes a business philosophy and culture that eliminates all forms of waste from the company business flows in order to shorten the lead time. This can be achieved by performing value-added activities in the best possible way and constant business process improvement and employee development. The application of the basic principles of lean business concept brings numerous benefits both at operational and strategic levels. At the beginning of the application of lean business concept, only operational improvement is visible. This is because strategic improvement comes only after changing the way of thinking, business culture, and working methods, of both managers and executives. By guiding managers and executives towards reducing waste in business processes, operational improvement becomes strategic. Lean business concept, as market orientated, integrated and flexible management system, provides increased value for customers, enhances business process and employees within it, and focuses on all phases of product's life cycle, not only few. Advantages and disadvantages of the implementation of some of the above mentioned concepts of costing and cost managements in lean business environment are discussed in this paper.

Key words: lean business environment, ABC, Target costing

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INTRODUCTION

Achieving a better market position, faster responses to customer demands, and products of better quality than competitors', imply continuous monitoring and adjustment to changes in the environment as well as development and implementation of new business concepts. One of the concepts that corresponds to changed market conditions is the lean business concept, which highlights the customer value by eliminating waste and non-value-added activities. Lean concept was initially applied in the production process, and later its application was extended to all processes in the company.

Successful performance of management activities, as evident in balance sheet and income statement, making business decisions and systematic control of business and financial processes in companies applying the lean concept require relevant and reliable accounting information. Existing costing and enterprises management concepts, such as, among others, target costing, activity-based costing, and the theory of constraints, produce information useful for carrying out the management activities in companies performing their activities in the lean business environment. The application of these concepts has greatly improved the company operations.

The aim of this paper is to overview the compatibility of existing costing and enterprise management concepts with the lean business concept, with the purpose of improving enterprise performance. Namely, existing costing and enterprise management concepts appeared in different time periods; they are focused on the different phases of the product's life cycle when reduction and cost management are in question; information that they produce are used for short-term and long-term business decision-making; some of them pay attention on constraints factors; thus questioning their compliance with the managers' requests in enterprises which apply lean business concept.

Methodological procedures and techniques inherent in the social sciences will be applied in the paper. The general conclusions about the considered problem are obtained based on the theoretical analysis of relevant literature. Additionally, the comparative analysis is used to emphasize the basic characteristics and determine the differences of existing costing and enterprise management concepts, and lean business concept.

The paper is divided into two parts. In the first part, the essence of the lean business concept is considered and special attention is given to the benefits arising from it, when lean is viewed as a comprehensive enterprise business strategy. The second part provides comparison of the cost and management concepts with the lean business concept and analyzes the advantages and disadvantages of implementation of individual costing methods in lean business environment.

LEAN BUSINESS CONCEPT

Lean business environment emerged as a combined result of business globalization, rising competition, increasing demand and declining customer loyalty, pervasive technological innovation, application of modern manufacturing and information technology, drastic decline in product life cycles, and other changes that happened in enterprises and their environment. In such conditions, better competitive position implies the acceptance of new business concepts and the change in the way the company's production process is organized. Companies adapt to the changed business environment by applying a lean business concept. Lean business concept is a philosophy and methodology to eliminate waste, reduce costs, and increase organizational efficiency. Lean business concept was originally applied in the production process, with production focus on "value streams". This production process appeared in Henry Ford's company in early 20th century, and later Toyota significantly improved it. The aim of lean production is to minimize waste in the production process and to produce high-quality products in as short a time as possible. Lean production reduces uncertainty and all kinds of waste.

Elimination of waste is done in all business areas, both in human resources, as well as in terms of space, machinery, time, and costs, with the aim of satisfying customer wishes and demands. Companies applying the lean concept manage to reduce operating costs by 20-40% as well as the time cycle by freeing up the capacity to perform production activities.

Managers in most industries focused their attention on reducing costs and increasing value and performance. The focus of significant savings was on the production process, sales, and post-sales services. However, recent research has shown that managers' attention and efforts to achieve savings need to focus on internal activities and services performed between organizational units of the company. Managers have considered the whole business process with special emphasis on what activities and services certain organizational units should do in order that the next organizational part could smoothly perform its function. Research has shown that the costs of these internal activities and services account for 10-30% of the total company costs (Schiemann et al. 2009).

Establishing a lean business concept implies the following steps and is based on five key principles (Hilker, 2011):

- Define value from the standpoint of the end customer;
- Identify all procedures in the business process and eliminate those processes that do not create value, i.e. establish a "value stream";
- Ensure smooth product flow towards customers;
- If the product flow is interrupted, allow customers to help create value (introduce request system);
- Start a process that has a clearly defined value, identified product flow, removed redundancies and waste to create a perfect value for customers.

The first step in establishing the lean business concept is determining value. The value is most often defined as the benefit or difference that stakeholders and customers receive from products or services when they deduct the costs they had to obtain that benefit. The value to be created is determined by the end customer. The customer determines the characteristics of the product that will best meet their needs. Value thinking from the customer's standpoint allows managers to focus on potential opportunities to increase value by understanding customer needs (customer value) and optimizing the use of resources in the company (functional lean). The basic characteristic of functional lean are (Schiemann et al., 2009):

- Focuses on the elimination of non-value-added activities and costs while preserving the key competencies necessary for performing primary activities,
- Guides all internal service processes in one direction,
- Directs demand for activities and services of organizational units,
- Does not require large investment and a long time period to see the benefits, and
- Focuses on drastic improvement, not just on individual segments.

Company managers accept this defined value as the goal they need to achieve in order to meet customer demands and increase their loyalty. With the defined value, all employees in the company, who are involved in its creation and delivery, should be introduced.

Establishing a value stream involves the inclusion of all the activities that are necessary to create value. The value stream includes all the activities that need to be done from the moment of the product idea, through its production, to the moment of delivery to the end customers. First of all, it is necessary to define the mission of performing certain activities. Once the mission is defined, the key activities to be carried out, contributing to the accomplishment of the mission, are identified. The established value stream goes beyond the production process and relates to the overall business process, which clearly indicates the importance of its establishment and its

potential as a measure for revenues, costs, and outcome. Careful selection of value streams and the organization of all activities in a way to maximize value for customers bring significant savings in the business process itself.

In order to ensure a smooth product flow to customers, it is necessary to take care that the product does not go beyond the defined map limits. Once the value is identified and the value streams established, it is necessary to focus on actual objects, i.e. specific design, order, and the product itself. Lean concept involves the removal of all obstacles to the continuous product flow. Finally, the entire product flow process needs to be reviewed again to avoid duplication of activities and eliminate unnecessary business activities. Eliminating obstacles and waste in processes has traditionally been a manager's job, but the hidden waste in the processes has not been given much attention. This hidden waste can sometimes severely disturb the process itself and the product flow. In this sense, lean uses numerous techniques, such as Just in Time, Kaizen, 5 S, Standardization of Work, and the like so that the product goes smoothly through all stages of the process.

Pull system focuses on customer demands, and, it aims to ensure the conditions for starting production when managers receive market requests. The customer is the one who determines when the production of the required value will start and the pull system allows the company to always have the appropriate level of stock.

Applying the lean concept means traveling rather than a destination to be reached. This is because the process of applying the concept does not end with the application of these five principles, but is constantly striving to find ways to improve the processes and minimize all forms of waste both within the company itself, i.e. functions performed in it, and in activities between the company and the environment.

Lean concept has long been seen as an approach to achieve operational efficiency. Later, lean has gained a significant role in the implementation of the corporate strategy. Lean can be the company strategy with focus on customers, allowing it to better understand customers and offer greater value than competitors (Kapanowski, 2016a). By applying the lean concept as a comprehensive strategy, company managers are able to adapt quickly to new circumstances, increase revenue, promote entrepreneurial activity, and achieve synergy.

Companies that apply lean either as a business concept or as a strategy are able to faster adapt to changes in and out of the company. In the lean company it is known exactly how the processes are performed, in what way, and with what resources. In the event that it is necessary to shorten the lead time, processes can be redesigned and directed in order to perform as efficiently as possible.

Lean concept can increase the company revenue while at the same time keeping costs at the same level. As the lean company tracks the time and way of performing an activity from the moment of product order to its delivery, in order to find non-value-added activities that lose a certain amount of money, companies can increase products or service throughput for customers and thus increase the capacity to make additional sales. Normally, lean was viewed as a way to reduce costs and free up capacity, while the ability of the lean strategy to increase revenue was not so much discussed.

Changes and improvements occurring in the lean company are noticeable for all employees, therefore employees are motivated to use and improve their knowledge and skills in order to contribute to the overall process. Lean strategy forms a corporate culture that emphasizes respect and appreciation of employees and values their contribution to business. Every employee applies one of the lean techniques in their workplace and is able to see their contribution to business improvement.

Finally, lean strategy integrates all stages of the business process into one whole. We get one company that functions as a system, rather than separate parts that have their own goals. The involvement of each company employee and making them focus on customers while respecting people and continuously tracking changes helps the company perform only value-added tasks and activities and eliminate waste from all processes. Lean establishes processes in a company that are under control, efficient and effective, not with the goal of achieving absolute control, but to improve them. Lean uses the existing resources to establish these processes.

Lean implies the identification, elimination, and reduction of waste or non-value-added activities in processes that are performed in accordance with the customer demands. Lean concept differs from other improvement methodologies in that it implies respect for employees and elimination of waste, while understanding the fact that nothing is perfect (Kapanowski, 2016b). Lean develops and uses all organizational resources to eliminate waste and continuously improve business according to customer requirements. The idea behind this concept is that everyone in the company, not just managers, strive to add customer value.

POSSIBILITY OF APPLYING CONCEPTS OF COSTING AND COST MANAGEMENT IN LEAN BUSINESS ENVIRONMENT

Lean business concept, aiming to improve quality, delivery, and lead time, applies a number of lean techniques. Changes in business philosophy as a respond to the changing business environment have to be followed by the changes of the most important management information support, i.e. changes in the accounting information system. Accounting information system has an impact on the acceptance of new business philosophies in three ways: technical, formal, and cognitive (Ahlstrom et al. 1996). The application of new business philosophies involves the accounting recording of new data for the needs of managers. Companies already have an accounting information system that needs further improvement. When it comes to the formal impact, it is necessary that the administrative functions, which include both the accounting department and the IT sector, have a control function. These departments must take into account the established control over operational activities, but also must take care of the implementation of the new business philosophy. The cognitive impact relates to how the accounting system is used and what its impact is on the organization. This primarily refers to the opinion and attitude the top managers have in terms of the accounting system. If they seriously understand the need to adapt the accounting information system to new business circumstances, the effect of changes will be greater and more seriously understood in the company.

Companies that have begun their lean transformation process can apply the following concepts of costing and cost management: target costing, activity-based concept, and the theory of constraints. Table 1 summarize the comparative view of these concepts, as well as lean concept, according to the time of occurrence, original and expanded purposes, time orientation, solutions to the problems of optimization, control, cost allocation, inventory level, waste, capacity, quality, flexibility, performance measurement, possibilities for improvement, etc. Table 1 gives a comparative overview of these methods and the lean concept.

The concept of target costing is a proactive and forward-looking approach that encourages fast product development and a fast design, which, on a highly competitive market, can be one of the prerequisites for achieving a leadership position, which is in the essence of the lean business concept. Also, this management concept establishes a direct link between specific customer requirements and product design and costs, which is basically lean business concept (Innes, 2004).

Table 1. Comparative overview of cost and management methods and the lean concept

Concepts	Target costing	ABC/M	Theory of constraints	Lean
Time of occurrence	1980	1910, but popularized in 1980	1980	1950-1960
Original purpose	Cost reduction	As accurate product cost as possible	Business improvement	Reducing waste and increasing efficiency
Expanded purpose	Business improvement in all segments	Activity management	Promotes continuous improvement philosophy	Promotes continuous improvement philosophy
Concept of optimization	Promotes optimization system	Not covered by ABC	Promotes optimization system	Promotes optimization system
Improvement	Cosntant review of the achieved cost level	By introducing activity analysis	5 levels to identify constraints	Kaizen
Time orientation	Long-term improvement	Long-term focus on variable costs	Short-term orientation with long-term implications	Long-term improvement
Control	Value engineering and value analysis	Not pronounced	Drum-buffer-rope	Pull system with the help of kanban
Cost allocation	Cost focus on the desired level	Costs are allocated to activities, and then product	No cost allocation	Linking costs in value stream
Inventory level	Does not take into account inventory	Does not take into account inventory	To overcome constraints	Minimizing to zero level
Waste	Elimination to achieve target cost	Perceived by applying ABM	Reduction at the place of perceived constraint	Elimination
Capacity		By applying TDABC	Takes into account the existing capacity but does not tend to establish balance	Measured using cycle time, establishing balance between capacity and labour
Quality	In pre-production and production phases	Not pronounced	At constraint level	Quality at source
Effects of inventory on profit	Increases profit	Increases profit	Throughput costing reduces profit	Throughput costing reduces profit
Flexibility	Not strictly pronounced, but possible in pre-production phase	Not strictly pronounced, but possible at consumption driver level	Depending on events in a company and constraints	Applied from operational level with the help of statistical process control
Performance measurement	Target profit depends on sale price and target cost	Product costs, activity costs related to profitability	Maximizing throughput, while minimizing inventory and operational costs	Non-financial and financial measurement

Source: James R. Martin, Ph.D. (1996) Comparing Traditional Costing, ABC, JIT, and TOC. Cost Management; Kapanowski, G. (2016) Lean fundamentals for accountants, Cost Management, January/February

The role of designers in terms of ensuring certain quality and functionality of products, and the role of managers, who control and coordinate cost management, is basically the target cost concept. Also, the role of strategic management accountants as managers and experts is significant to achieve the target cost. This management concept does not focus enough attention on employees who are directly involved in product creation, which is contrary to the lean business concept where strengthening the role of employees is a very important success factor, as managers consult them to set up projects for continuous business improvement. Through analysis and cost reduction, one should find the best way to produce products at the lowest price,

and the emphasis of this concept is on determining the target cost and the activities that are being undertaken to achieve it at the pre-production stage. Once it is calculated, the focus is on its detailed elaboration and achievement, with constantly finding new opportunities for additional reductions. Eliminating all types of waste and achieving zero inventory levels cannot be achieved by the target cost concept, as the level of inventory is determined in cooperation with suppliers, where the needs for product components play an important role. Lean business concept tends to optimize and continuously improve all business processes in all phases of the product life cycle using a number of techniques, leading to lower inventory levels. With target costing, the tendency for business optimization is not particularly pronounced as continuous improvement is focused on the product design phase. The orientation of this concept on the product design stage is important for lean business concept, because, at this stage, activities that determine quality, price, cost, functionality, and the like are carried out. Quality with all other product attributes, as well as control using pull system and kanban are requirements within lean business environment. The externally determined value and product quality are good sides of target costing, with the aim to, through the process cost reduction, preserve product quality, rather than ensuring the quality at source, which is the task of the lean business concept. Instead of applying a pull system in a lean business environment, target costing applies a value engineering technique. The application of this technique yields good results, but for long-term operations in a lean business environment it is more appropriate to apply a pull system.

The primary purpose of doing business in a lean business environment is to reduce waste in order to increase business efficiency, with precise costing. Activity-based costing fits into this lean requirement in terms of precise costing and long-term orientation. Activity-based costing does not give precise information on how much the costs actually should be in order to achieve the defined goals. It allows for an understanding of how the costs arise in the company, as well as which products are profitable and which product mix is favorable for the company. However, finding information about product profitability involves the collection of additional data on business processes that are carried out in a company. Gathering this data implies additional efforts and costs. Certainly, the collection of additional information for business decision-making, which results in a decision to achieve the defined goals, should not represent a redundant activity, but it is at high risk. Managers in a lean business environment need information support that will immediately produce the desired information, and not require additional activities and losses. Activity-based management has expanded the field of action of this concept in terms of promoting a culture of continuous improvement. This is because activity-based management encourages the analysis of activities and aims to eliminate non-value-added activities. The shortcoming of activity-based management in a lean business environment is the absence of a tendency to optimize the activity performance. Activity-based costing takes into account the process flow in the company as one of the principles of the lean business concept. However, this accounting system combines costs with activities and individual products, not with the value stream and production cells.

One of the assumptions of the lean concept is finding a direct link between calculating precise operating costs and improving operational performance, on which activity-based costing does not insist. The original activity-based costing model does not respect the existence of unused capacity which the lean business concept specifically takes into account. This disadvantage has been partly eliminated by applying time-driven activity-based costing (Antić et al. 2016), but not entirely. It should be noted that activity-based costing is complex for everyday use, which is in contrast to the simplicity and comprehensibility, on which lean business concept insists.

The concept of the theory of constraints has since its creation sought to find problems in the process functioning and direct its attention to the application of 5 basic steps (Antić et al. 2015). However, this concept, as well as lean, promotes the philosophy of continuous improvement, but

improvements occur only at the point of the observed problem. The theory of constraints strives for simultaneous increase in throughput and the reduction of operating costs and inventory, with much more attention being paid to the opportunities to increase throughput than to reduce operating costs. Reduction of operating costs is carried out to the level at which the product quality will not be compromised, and the reduction in inventories can be made to the extent that the continuity of sales will not be affected. Reduction of operating costs and inventories is a secondary objective of the theory of constraints, while reducing costs occurs only at the place of the constraint. In such a situation, only waste that affects the throughput can be reduced, not real waste that can compromise the entire product flow through the company. The concept of the theory of constraints justifies the formation of inventories in situations where managers' efforts are aimed at overcoming constraints. In such circumstances, it is justified to keep a certain level of safety stock that will protect the company from sudden change in demand. The purpose of keeping the safety stock is to synchronize the product flow. The amount of safety stock or additional time is determined by the production schedule and the time of material flow through the processes. In a lean business environment, inventories are considered waste, and their holding is unjustified. Lean business concept aims to reduce the safety level of stock, regardless of possible changes in demand.

In the case where there are inventories that are not used for the production process, the lean business concept considers that the capacities associated with these inventories are waste. Business processes in the company cannot function perfectly from the start, so improvements need to be planned. In the process of planning better resource utilization, the theory of constraints recognizes both internal and external factors. The priority of the selected factors depends on the amount of contribution to throughput. The theory of constraints seeks to find the weakest link in the company operations as a whole, in order to improve performance. Lean business concept in planning resource utilization starts primarily from internal factors, and later includes factors outside the company.

CONCLUSION

The basic purpose of the lean concept is to reduce all forms of waste and costs (fixed and variable) that occur in business processes in order to increase the efficiency of operations and achieve take time. Later, the purpose of lean concept was extended to promote a culture of continuous improvement in order to achieve significant improvements of operational and strategic significance. For these purposes, lean concept uses a number of techniques that reduce waste in terms of space, employee's workplace, even employees themselves.

Although target costing has significantly improved company operations, its application in the lean business environment shows certain limitations. The basic limitation lies in its focus on cost reduction, designed in the planning and product development phase, which is not in line with the basic principles of the lean concept. Target costing relates to cost reduction in order to achieve a competitive product market price. In this sense, this costing concept does not reduce costs and unnecessary activities in the company to the lowest possible level, which is basically a lean business concept. The costs are reduced only to the target amount, not to the level at which all types of waste are eliminated. Target costing also requires the cooperation of all partners in order to achieve value for the customers through value engineering.

The application/implementation of activity-based costing in a lean business concept has shown some weaknesses. One of the weaknesses is its complexity for everyday use. Activity-based costing explains how costs arise in a company, but, to determine product profitability, involves the collection of additional data and information about business processes that are carried out in a company. Performing redundant activities to collect business process data causes additional costs and excessive waste. Undoubtedly, this costing method more accurately calculates the

product cost, but it does not provide information on how much the costs actually should be. Combined with activity-based management and time-driven activity-based costing, activity-based costing acts towards the expanded purpose of the lean business concept, i.e. aims at continuous business improvement. Also, this concept allows unused capacities to be monitored to a certain level.

The theory of constraints fits into the demands of the lean business environment in terms of defining value by customers. The value is reflected in the production of high-quality products, without defects, with the minimal investment of capital and employee efforts in a shorter period of time. Customer value is considered differently in both concepts. The advocates of the theory of constraints consider that the value is a factor that determines whether the company will increase throughput. Lean business concept demands that it is necessary to identify and eliminate unnecessary resource spending in order to achieve value. The key to the company success in a lean business environment is product quality, which the theory of constraints also supports. In order to ensure product quality, all business processes must be monitored through value stream. For the successful implementation of the theory of constraints in the lean environment, there is a need for a continuous product flow in small batches. Continuous product flow is achieved with the pull system. These constraints arise from the pull system through the schedule of overall company activities and the provision of conditions for their execution, while lean companies use kanban. In this way, both concepts considerably reduce inventories arising from work-in-progress and finished products and thus create free capacities. Inventories of work-in-progress and finished products are considered to be one of the limiting factors for achieving company goals in both concepts.

Because of the great informative power and suitability of the concepts described above, implementation is possible in the short term. At the beginning of transformation into lean, companies can choose one of these concepts to monitor business improvement. In practice, there have been cases of implementation of these concepts, and the companies that applied them made it easier for them to transform into a lean company. In the later stages of company transformation into lean, all of the stated shortcomings of these costing methods come to the fore.

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ZERO-BASED BUDGETING AND ROLLING BUDGETING: APPLICATION POSSIBILITIES

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Abstract: *The traditional approach to budgeting is based on the assumption that the environment and business conditions will remain the same for the entire budgeting period. This is a key limitation of the traditional approach to budgeting. The unsustainability of the assumption of the invariability of environmental conditions, including economic conditions, competition, customer preferences, etc., implies that after a certain lapse of time and unavoidable changes in environmental conditions budget which was created will lose actuality and relevance. On the criticism of the traditional budgeting techniques were created alternative budgeting techniques. Some of the alternative budgeting techniques are activity-based budgeting, kaizen budgeting, zero-based budgeting, rolling budgets and forecasts, program budgeting, etc. The subject of this paper are two alternative budgeting techniques, namely zero-based budgeting and rolling budgets. The main goal of this paper is to point to the essence, process and effects of zero-based budgeting and rolling budgets, i.e. to identify the possibilities and limitations of their application. Paper will contribute to better understanding and more efficient implementation of these budgeting techniques. Zero budgeting is a bottom-up approach which leads to thinking whether things need to be done the same way as before or need to be changed. The key point in ZBB is to find alternative ways to achieve defined goals. Rolling budgets represent a very dynamic approach to budgeting which eliminates the limitation related to the budgeting period. The essence is that the budget is compiled in such a way that after the expiration of a period (month or quarter), the next period is added to the original budget for the previous period. It has found that both techniques are applicable in conditions of a dynamic environment, and that their application can improve the implementation of management functions. Zero budgeting contributes to cost efficiency, increases effectiveness and accountability of management structures. Rolling budgeting enables companies to achieve business efficiency and flexibility at the same time. Research in the paper will be conducted using methodological procedures and techniques inherent in social sciences, i.e. qualitative methodology based on the descriptive analysis of the research objective.*

Keywords: *budgeting, budgeting techniques, zero-based budgeting, rolling budgets and forecasts*

JEL Classification: *M 41, M49, H 72*

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INTRODUCTION

Budget, as a formal quantitative expression of the planned future activities, is an important management tool (Novičević and Antić, 2013, 215, Stevanović, 1991, 197). Budgeting, as a process of data preparation to guide the future company activities, by nature is an expression of management *planning* activities. Budget plays a role of a *communication tool*, which transforms the defined long-term and strategic objectives into specific operational activities through the process of formal delegation of management authority, powers and responsibilities at all levels. At the same time, budget is a tool for the implementation of *coordination activities*, since it harmonizes the objectives of company departments and the entire company objectives. Budgeting allows for efficient *leadership*, i.e. managing interpersonal relationships, and contributes to the construction of an adequate *motivation system*. Budget determines performance standards. At the same time, budget is a motivation tool to achieve these standards, but it also allows measuring performance. Thus, budget also enables the implementation of *control*.

Budget is not fixed and robust allocation of funds to carry out some activity and does not give an accurate forecast of future flows. Nevertheless, it allows managers to, based on the budgeting starting points and assumed authority and responsibilities, and when changes in business conditions occur, manage changes and implement budget adjustment. Hence, budgeting is a continuous and dynamic process that forces managers to think ahead, allowing business problems to be avoided or their negative effects mitigated. Managers that do not use budgeting work by the principle “from day to day” and do not think about future problems. Such managers never have completely clear objectives, and without clear objectives there is no adequate action.

The usefulness of the budget is determined by a number of factors, ranging from the quality of the underlying information system, to the approach, i.e. techniques used to produce it. Literature and practice mention and apply several different budgeting techniques. Contrary to traditional budgeting and its limitations, innovative budgeting techniques are listed. Developed as an expression of altered business conditions and the need to eliminate traditional budgeting limitations, the most common techniques in literature are activity-based budgeting, kaizen budgeting, zero-based budgeting, rolling budgets, program budgeting, and the like.

The research subject in this paper are two budgeting techniques, namely zero-based budgeting and rolling budgets. Both budgeting techniques are applied in conditions of a dynamic and uncertain environment. While zero-based budgeting focuses on cost efficiency and increased management efficiency, rolling budgeting allows for simultaneous business flexibility and efficiency. Hence, the main goal of the paper is to point out the essence, process, and effects of zero-based budgeting and rolling budgets, i.e. to identify the possibilities and limitations of their application. The paper, in addition to the introduction and conclusion, consists of three parts. The first part points to the essence and process of zero-based budgeting, and the second to rolling budgets. The third part analyzes the application possibilities and limitations of these two budgeting techniques.

ZERO-BASED BUDGETING

Why do they do what they do and can resources be used differently are questions set by Peter Phyrre at Texax Instruments during the 1960s, which led to the creation of zero-budgeting, (Morgan et al., 2015; Bandy, 2015). The crucial problem in this company was how to develop an adequate decision-making mechanism that will make the company competitive and sustainable in a rapidly changing environment. The moment when this budgeting technique appeared was characterized by radical changes in the economic, social, and political environment, unemployment, recession, and energy crisis. There was a need to strengthen

business control mechanisms, which zero-based budgeting was tending to achieve. In addition to cost control, the focus shifted to result control and achieving the best outcomes. This led to the application of zero-based budgeting in the US state administration in 1971, on the grounds that it can be a very useful tool for countries characterized by economic decline or underdevelopment.

Zero budgeting is a short-term management tool aimed at achieving the goals set in a cost-efficient way. This is a bottom-up approach that requires participation of managers at all levels. This approach leads to thinking whether things need to be done the same way as before or need to be changed. Hence, the key point in ZBB is to find alternative ways to achieve defined goals. Potential, existing, or new programs are systematically valued in order to allow budget reduction or expansion and ensure resource reallocation from lower-priority programs to higher-priority programs (Leininger and Wong, 1976, 2). The managers are expected to “start from scratch”, assuming that any activity whose implementation is being considered has not existed before, as opposed to the traditional budgeting approach (Table 1). The entire budget is viewed as a series of “replaceable” proposals, where each proposal must be analyzed and justified in order to be financed (Budgeting Manual, 1979, 84). The precondition for resource allocation is precisely evaluating and ranking each proposal.

Table 1. Comparison of traditional budgeting and ZBB

Traditional budgeting	ZBB
Operational budget is estimated.	Operational budget develops through the evaluation of existing activities and alternatives.
The current database is accepted and the costs of new activities are estimated.	It starts at the zero level and estimates all costs associated with the activities.
The costs and benefits of new activities are estimated.	The costs and benefits of all activities, including alternative activities, are identified and evaluated.
The emphasis is on available money, the main issue in the preparation of a detailed budget.	The emphasis is on purpose and activities in accordance with priorities.
No alternative ways of implementing activities are considered.	New approaches are explicitly considered.
The result is reflected in the “take or leave the budget”.	The result is reflected in the compromise between different options, given the different levels of services and costs.

Source: McKinney, 2015, 446.

Although it emphasizes cost-effectiveness, the goal of ZBB is not to reduce the scope of effects, but to reduce money spending. At the heart of this approach is the belief that more products and services can be delivered to users with the same or lower costs. At the same time, it encourages innovative thinking, with the aim of improving productivity and economic performance.

The ZBB process is relatively complex and includes four steps. The first step is the development of planning assumptions and defining objectives, which is the responsibility of the top management. These are the key inputs that should enable the budget preparation (as in the case of traditional budgeting, it is necessary to know the projected inflation rate, salary growth, and the level of services to be provided). The second step is to define the decision-making unit, which is within the competence of the middle management. It is about the center of responsibility for which the manager is responsible and for which the budget should be prepared. The most common decision-making unit is the program or organizational unit with recognizable and measurable goals for which the budget is prepared and for which individual or specific responsibility is defined. The third step involves the preparation of a package of decisions and is

the responsibility of the lowest level of management. For each decision-making unit, at least three or more decision packages should be defined, except in some specific cases where the program or activity costs are mandatory (or for other reasons). Each decision package is prepared for the lowest operational level, for which the cost-benefit analysis can be carried out. Information contained in the decision package should allow ranking in relation to competing packages. The fourth phase is ranking. Ranking should be done in such a way that it is clear who is responsible for the decision and which criterion is used for ranking. The ranking system and criteria are different and vary, and should be determined in accordance with the specific circumstances. This process can spend a lot of time and money, so the decision-making process should not be made more important than the outcome (Morgan et al., 2015).

ROLLING BUDGETS

The idea of rolling budgets is not new (Owens, 1949, 598), but in recent times many organizations are returning to this technique (Ekholm and Wallin, 2000; Serven, 2002). Rolling budgets represent a very dynamic approach to budgeting. Unlike traditional, fixed, and static budgets, this approach eliminates the limitation related to the budgeting period. The essence is that the budget is compiled in such a way that after the expiration of a period (month or quarter), the next period is added to the original budget for the previous period (Gowthorpe, 2009). Thus, the end of the budgeting period is constantly shifted forward, i.e. the next period (month or quarter) is added, and the earliest period is eliminated. There is no fixed end date for the budget period, and the budgeting period is usually 12 or 18 months. In this way, the company has a budget and a forecast for the next period at any time at its disposal. So, it is a budget that is constantly updated, through a constant and strategic review of business and the environment, and by incorporating changes in the budget. Hence, its unequivocal focus is on the future.

Rolling budgeting allows one to consider priorities, review the plan if needed, and reallocate resources to achieve the company's strategic goals. This means that it ensures flexibility, but it also insists on accountability, in order to ensure management's commitment to achieving the goals of the department and the company as a whole (Sumedera and Costin, 2014). The rolling budgets concept is characterized by flexibility, i.e. continual changes over shorter periods of time predict activities and resources that will meet the newly emerging circumstances. It is a particularly popular technique because it is less detailed than traditional budgeting. A lower level of detail allows for a clearer view of the relevant budget elements.

Rolling budgeting improves forecast and changes the forecast function (Serven, 2002). This is a process of continuous planning and forecasting. Forecasts eliminate the gap between forecasts made at the beginning of the period and the new changes and circumstances in the environment. Rolling budgets enable effective integration of operational and strategic goals. Continuous changes allow the operational budget to constantly contribute to the strategic goals (Malinić, 2011).

Rolling budgets improve the operational planning process and at the same time involve greater participation of operational management. However, a large number of iterations and the creation of a rolling budget reduce the ability to use a budget to evaluate performance. This is especially because this approach introduces a sense of insecurity among managers and makes it difficult to build a performance measurement system (Hansen and Van der Stede, 2004; Gurton, 1999). Also, the process of making daily decisions, controlling, and managing cash flows is being improved.

Rolling budgets do not change anything essentially in the budgeting process, except that this process is not carried out only once a year. It also does not imply a too simple understanding that, instead of one, the budgeting process takes place four or twelve times a year. Management

must collect and process information much faster. The scope of the required data is far greater, as well as the overall organization's outputs applying it.

The rolling budgets implementation involves evaluating, understanding, and using the cause of change as a forecast base. Since it is a complex process, IT tools and business intelligence tools are essential (De Leon et al., 2012).

THE APPLICATION OF THESE ALTERNATIVE BUDGETING TECHNIQUES

Can zero-based budgeting and rolling budgets replace traditional budgeting or be used as complementary alternatives? Under what conditions is their application adequate and what are the key application limitations? Table 2 summarizes the advantages and limitations of these two budgeting techniques, and the following analysis aims to provide answers to the above questions.

Zero-based budgeting can be applied in any organization or department in which a cost-benefit analysis can be carried out and that do not apply a standard cost system. Most state and non-profit organizations fall into this category. Also, most of the services and areas of general expenses, such as personnel, counseling, accounting, legal sector, management and research, fall into this category. This technique is particularly applicable in areas that are dominantly based on human work, where productivity standards are difficult to determine and applied with cost projections. It is a useful tool in all organizations that focus on quickly achieving favorable financial results and improving the management effectiveness. It is applicable in organizations where there is a need for resource reallocation in order to achieve new or changed priorities, where productivity and cost efficiency need to be improved. Bearing in mind the effects, the decision to implement zero-based budgeting should be based on good arguments and a more detailed analysis of the organizational environment. There is a view that it may be better to use zero budgeting for certain services, functions, or organizational units, rather than as a tool for total annual budgeting (Bandy, 2015). Special application problems can occur in the state administration, since there are state programs and projects that are introduced by legal acts and which cannot be changed in the short term without changing the law.

Table 2. Advantages and disadvantages of zero budgeting and rolling budgets

	Advantages	Disadvantages
Zero budgeting	<ul style="list-style-type: none"> • Focus on priorities, rather than inputs • Motivates managers • Increases the management effectiveness • Enables the development of innovative scenarios 	<ul style="list-style-type: none"> • Complexity • Time-consuming process • Demotivates managers (losers and winners) and creates conflicts • Ignores knowledge and experience of existing employees • Increases the cost of employee training
Rolling budgets	<ul style="list-style-type: none"> • Lower level of detail • Easy to implement • More precise • More flexible • Ensures a more flexible allocation of resources • Less manipulative because it does not have a fixed target • Eliminates short-sightedness of management 	<ul style="list-style-type: none"> • Increased time consumption • Demotivating for employees due to continuous budget revision • Creates uncertainty • Creates management dissatisfaction • Difficulties in designing a motivational system • Difficulties in designing a compensation system

Source: McMillan, 2010; Gurton, 1999; Morgan et al., 2015; Bandy, 2015, McKinney, 2015.

Note: Analysis of advantages and disadvantages is given in relation to traditional budgeting.

On the other hand, rolling budgeting is a technique that can be used by companies of all sizes, especially by fast-growing companies (McMillan, 2010). However, one should keep in mind that, with these companies, due to the lack of a clear organizational structure, rolling budgeting can lead to confusion regarding the roles and responsibilities of management. Rolling budgeting is a solution for those companies that want to be flexible and efficient at the same time (Sumedera and Costin, 2014). The prerequisite for rolling budgeting are well-trained and qualified staff and the existence of modern information and communication technology. The decision on the implementation of this budgeting technique should be made taking into account the cost/benefit ratio.

Finally, it should be pointed out that both budgeting techniques are applied in conditions of a dynamic and uncertain environment, that they were created as a result of changed business conditions and as a step forward in relation to the weaknesses of traditional budgeting. The zero budgeting process is more complex, and rolling budgeting is more demanding in terms of time, as it is a continuous activity, especially if it is updated on a monthly basis. Zero budgeting refers to a period of 12 months, which is usually the case with traditional budgeting, while in the case of rolling budgeting there is actually no fixed end date of the budgeting period. Hence, rolling budgeting is more focused on the future. In terms of effects, zero budgeting focuses on cost efficiency and increasing the management effectiveness, while rolling budgeting allows for simultaneous realization of business flexibility and efficiency. The achievement of both goals is based on adequate forecasting of sales and budget based on this information (Sumedera & Costin, 2014). In both cases, intensive management participation is necessary at all hierarchical levels, in particular the engagement of operational management, with zero budgeting based more on bottom-up approach. The negative side of both budgeting approaches is that they can potentially influence impaired management motivation and uncertainty. Zero budgeting stimulates competitive relations between managers, since winners and losers are announced in some way every year, in a way that leads to conflicts. On the other hand, rolling budgeting makes it difficult to measure performance and control, and there are problems with building an adequate system of management motivation and rewarding.

CONCLUSION

Changed business conditions in the past decades have challenged the for a long time almost unquestioned fact that budgeting, as a process, and budget, as the outcome of this process, are treated as a management tool, with an irreplaceable role in the realization of management activities. This situation is largely influenced by the characteristics of the dominantly used traditional budgeting, whose performance in the newly created economic environment is not at a satisfactory level. Traditional budgeting is characterized by goals set at the annual level and, in this regard, the defined management responsibilities. The key negative effects of the budget defined in this way are that it appears as a key deterrent factor to more flexible business, teamwork within and between departments, which prevents innovative solutions in unforeseen situations and dampens innovation and learning processes (Neely, Sutcliffe, Heyns, 2001).

However, practice shows that budget is an organizational imperative if the company wants to control costs and forecast financial performance, while the budgeting process is highlighted as the most important coordination mechanism in most companies (Otley, 1999, 371). Hence, the question arises as to how to use the budget as a management tool to make the future more certain and how to achieve the company goals in an intensely competitive and dynamic environment.

Numerous studies indicate that the use of new budgeting approaches with specific characteristics gives an additional use value to the budget (Hansen and Van der Stede, 2004). Hence, one of the key factors of quality, expediency, and usefulness of the budget is the applied technique, i.e. its methodology.

There are numerous innovative techniques in literature and practice. Different budgeting techniques have a different impact on budget performance (Hansen, 2011), finding application in special circumstances and giving different effects. The analysis carried out in this paper has aimed to indicate the possibilities and limitations of applying zero budgeting and rolling budgeting. It has found that both techniques are applicable in conditions of a dynamic environment, and that their application can improve the implementation of management functions. Zero budgeting contributes to cost efficiency, increases effectiveness and accountability of management structures. Rolling budgeting enables companies to achieve business efficiency and flexibility at the same time.

However, one of the key questions regarding the application of these techniques is whether they can completely replace traditional budgeting. There is no unique attitude regarding this issue, although the term complementarity may often be encountered. When it comes to zero budgeting, it is often emphasized that it has better performance if it is used only for certain services, functions, or organizational units, rather than as a tool for total annual budgeting (Bandy, 2015). When it comes to rolling budgeting, the benefits of integrating it with other techniques, such as activity-based budgeting, are highlighted (Hansen and Torok, 2004). In fact, combined use of different budgeting techniques is often advocated. It is hardly possible, and it is not a goal, to make the final conclusion about the use value of these two techniques. What is certain is that without an adequate and studious analysis of a specific internal and external organizational environment, with the necessary cost-benefit analysis, it is difficult to make the right decision about the application of a particular technique.

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COMPARATIVE ANALYSIS OF THE CAUSE OF MODIFICATION IN AUDITOR'S OPINION IN FINANCIAL SECTOR AND REAL SECTOR COMPANIES

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Abstract: *The purpose of engaging an external auditor is financial statements quality assurance by presenting an opinion in an auditor's report. For the client, the most favourable opinion is unmodified opinion, in which an auditor assures the beneficiaries that the financial statements are true and fair view. Modifications in auditor's opinion imply presenting adverse auditor's opinion, qualified opinion, and disclaimer of opinion. Comparative analysis of the reasons for presenting modifications in auditor's opinion in companies of different activities is carried out in the paper. The research includes audit reports of all insurance companies and banks in the Republic of Serbia as the most important organization of the financial sector, while in the real sector, opinions on reports of food manufacturing companies in the period between 2011 and 2017 are analysed. Within the sector, all companies are stratified according to the form of opinion they received in auditor's report. The aim of the research is to overview the types and frequencies of certain reasons for modifications in auditor's reports, to draw conclusions about the consistency of the application of audit firms' professional scepticism. Moreover, the frequency of certain audit firms in verifying companies' financial statements was analysed. The analysis showed that more than 96% of banks received unmodified opinion and unmodified opinion with an emphasis of matter. Most of them operated with profit. Modified auditor's opinion in this sector is most often in the form of qualified opinion, which is not correlated with stated periodic result. Disclaimer of opinion and adverse opinion were always issued to banks that operated with loss, mostly due to a breach of going concern principle. The analysis found that, of modified opinions, insurance companies received only qualified opinion, mostly due to higher costs for operating expenses than expense loading and problems with receivables. The largest number of modified auditors' opinions was recorded in manufacturing companies. Almost half of the sampled manufacturing companies received completely unmodified opinion without an emphasis of matter. There is a wide variety of reasons for issuing qualifications in auditor's report, and the largest percentage is related to the overstatement of fixed and current assets. The concentration of audit firms is lower in the real sector. Modified opinions – disclaimer of opinion and adverse opinion are more frequent in the real sector and issued to non-profit companies.*

Keywords: *audit report, financial statements, qualified opinion, disclaimer of opinion*

JEL Classification: *M 42*

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INTRODUCTION

The basic function of the audit is to increase the credibility of financial statements, submitted by managers, which state the earning capacity and financial position of the company in the previous period. Whether the reports are true and objective, the auditor states by issuing opinion, which can be unmodified, in the form of unmodified opinion or unmodified opinion with an emphasis of matter. If there are discrepancies regarding the accounting coverage, the auditor issues modified opinion in the form of qualified opinion. If the auditor does not collect enough evidence to issue an opinion, due to inadequate co-operation with the management during the audit, the auditor will issue disclaimer of opinion, which is a type of modified opinion. When the extent of disagreement over the accounting treatment of certain positions of a fundamental nature is to that degree that users of disclosed financial statements cannot rely on their content, the auditor issues adverse opinion (Eilifsen et al., 2014). This is the most undesirable form of opinion, since it explicitly states that financial statements are not true and objective. Stated opinion is the key information in the audit report and the most important product of the entire audit process. The very form of this report has been amended with the aim to increase transparency. The most important novelty in the current form of auditor's report is that auditor's opinion is moved to the very beginning of the report. Also, in the new form of the report, the "basis for opinion" paragraph is included in unmodified opinion as well (Vučković Milutinović, 2018).

Modified auditors' opinions, if subject of user's consideration and analysis, can be of great benefit for taking the right business decisions timely in order to protect own interests and assets. An attempt to analyze auditors' opinions in financial and real sector reports has been made in the paper, in order to examine the frequency of the reasons for certain modifications to the auditor's opinion.

LITERATURE REVIEW

The analysis of the causes of modifications to the auditor's opinion in audit reports is not very present in the work of authors who deal with the audit of financial statements. The contents of the audit report and changes during the previous period were the subject of the analysis of the reports of most important accounting and auditing conferences in RS Symposium AAAS (Vučković Milutinović, 2018). The author emphasizes the change in auditor's report content form in order to better meet the interests of audit report users. Content improvements reduce the asymmetry of information held by managers and report users. The authors Lopez-Corrales&Fiestras empirically analyzed Spanish companies in order to see whether auditors make errors in writing reports. The authors concluded that reports with modified opinion contained a number of errors detected by the auditors, which they consider to be worth the attention of readers (Lopez-Corrales & Fiestras, 2015). The reasons why auditors make mistakes in issued audit reports were analyzed on the example of the auditors of Bosnia and Herzegovina (Šapina, H., Ibrahimagić, S., 2011). It has been found that there are numerous deviations from the requirements of International Standards on Auditing 700 and 701, from the aspect of formal content of the report's text, as well as from the aspect of essence.

METHODOLOGY

In order to test the hypotheses, opinions stated by auditors in financial sector and real sector companies between 2011 and 2017 in the Republic of Serbia have been analyzed. Financial and audit reports were downloaded from the database of the Business Registers Agency - BRA (www.apr.rs). The list of all banks and insurance companies was downloaded from the database of the National Bank of Serbia (www.nbs.rs). The banking system in 2011 encompassed 31 banks, while the number decreased to 29 in 2017. A total of 209 auditor's reports were analyzed. In 2011, there were 27 companies dealing with insurance in the RS and the number of companies

changed to 21 in 2017. A total of 177 auditor's reports were analyzed. By applying non-statistical selection of the sample, using the method of hazard selection, a sample of 46 large manufacturing companies belonging to the food industry was selected. All companies are obliged to audit their financial statements (Law, Article 2) and their audit reports (322 reports) were downloaded from the BRA's database. All companies are stratified depending on whether they received modified auditor's opinion, at least once during the analysis period, on: companies which always received unmodified opinion during the analysis period and companies that received at least one modified auditor's opinion during the analysis period.

Within the first group, companies that received only unmodified opinion and companies that received unmodified opinion with an emphasis of matter were analyzed individually. Within the second group, the companies were analyzed individually depending on which type of modification was stated in the audit report: qualified opinion, disclaimer of opinion or adverse opinion. For the purpose of drawing conclusions on the hypotheses, a comparative analysis and the method of auditor's report content analysis were applied. By comparatively analyzing the cause of auditors' modifications to certain forms of opinion and by taking into account the characteristics of companies' operations, an attempt has been made to consider the frequency of certain modifications in the analyzed sectors in order to draw conclusions on professional skepticism and consistency of auditors. The following hypotheses were tested in this paper:

- H1: Modified auditor's opinions are more frequent in the real sector due to the absence of institutional supervision function.
- H2: Modified auditor's opinion is not conditioned by company's periodic results.
- H3: The reasons for modifications to the auditor's opinion in the manufacturing sector are more diverse in relation to the financial sector controlled by the NBS.

RESULTS AND DISCUSSION

By analyzing audit reports in the banking sector, data on the structure of stated opinions were obtained, as given in the following Table.

Table 1: Overview of auditor's opinion in reports (bank)

AUDITOR'S OPINION	2011.	2012.	2013.	2014.	2015.	2016.	2017.
Unmodified opinion	24	24	23	23	23	25	26
Unmodified opinion with emphasis of matter	4	3	2	5	3	3	2
Qualified opinion	3	3	3	1	4	2	1
Disclaimer of opinion	0	0	1	0	0	0	0
Adverse opinion	0	0	1	0	0	0	0
Σ Bank	31	30	30	29	30	30	29

Source: Authors' calculation based on disclosed audit reports (www.apr.rs), August 2018.

Most banks received unmodified opinion in the previous period, which is 76.67% in 2013 and 2015 expressed in percentages (the lowest share of unmodified opinions) and 89.66% in 2017, when the share of these opinions was the highest. Unmodified opinion with an emphasis of matter, with a percentage share of 17.24%, was the highest in 2014 and the lowest in 2013 (6.67%). The share of modified qualified opinion was the highest in 2015 with a percentage of 13.33% and the lowest in 2014 and 2017 (3.45%). Auditors issued modified opinions (disclaimer of opinion and adverse opinion) only in 2013 and their relative share was 3.33%. Audit firms, which were engaged in the audit of banks' financial statements, are listed in Table no. 2.

Table 2: Audit firms engaged by the banks

AUDITOR	2011.	2012.	2013.	2014.	2015.	2016.	2017.
KPMG	9	7	8	9	8	5	3
Deloitte	6	8	8	7	9	6	8
E&Y	6	5	7	6	3	4	5
PWC	6	6	3	3	2	6	5
BDO	2	2	1	2	4	4	5
Moore Stephens	2	2	3	2	3	2	2
MGI	0	0	0	0	0	0	0
PKF					1	3	1
Σ for Bank	31	30	30	29	30	30	29

Source: Authors' calculation based on disclosed audit reports (www.apr.rs), August 2018.

The audit of banks' financial statements was mostly entrusted to the members of the "Big Four", whose share in the total issued opinions was dominant, but there was a downward trend in the movement. In 2011, the "Big Four" recorded a share of 87.10%, while in 2016 this indicator was only 70%. In the last analyzed year, Deloitte had the largest share. KPMG recorded a declining share in the audit of banks so that in 2017 it was 10.34%, while in 2014 it was 31.03%. Auditor's opinions issued to insurance companies, are listed in Table no. 3.

Table 3: Overview of auditor's opinion in reports (insurance companies)

AUDITOR'S OPINION	2011.	2012.	2013.	2014.	2015.	2016.	2017.
Unmodified opinion	20	22	20	21	20	17	18
Unmodified opinion with emphasis of matter	6	4	6	4	4	4	3
Qualified opinion	1	2	2	1	0	2	0
Σ Insurance companies	27	28	28	26	24	23	21

Source: Authors' calculation based on disclosed audit reports (www.apr.rs), August 2018.

In the overall opinions in the insurance sector, unmodified auditor's opinion recorded the highest share of 85.71% last year, while the lowest share of 71.43% was in 2013. Unmodified opinion with an emphasis of matter recorded a share of 14.29% in 2012 and 2017 to 22.22% in 2011. The only form of modified opinion in the insurance sector is qualified opinion, which was not recorded in 2015 and last year, while in 2016 the largest share was 8.7%. The audit of insurance companies' financial statements has been entrusted to the auditing firms as provided in Table no. 4.

Table 4: Audit firms engaged by insurance companies

AUDITOR	2011.	2012.	2013.	2014.	2015.	2016.	2017.
PWC	6	5	7	8	8	8	5
KPMG	12	11	6	6	5	4	6
E&Y	1	5	7	5	5	5	4
DELOITTE	2	1	2	3	3	3	3
MOORE STEPHENS	2	2	1	2	2	2	2
VINČIĆ	3	3	3	2	1	0	0
The others	1	1	2	0	0	1	1
Σ Insurance companies	27	28	28	26	24	23	21

Source: Authors' calculation based on disclosed audit reports (www.apr.rs), August 2018.

Insurance companies mostly engaged KPMG (28.57%) and PWC (23.81%) in the last year of the analysis. The "Big Four" had the highest share in 2015 (87.5%) and the lowest in 2011 (77.78%). Sampled manufacturing companies received auditor's opinions as displayed in Table no. 5.

Table 5: Overview of auditor's opinion in reports (manufacturing companies)

AUDITOR'S OPINION	2011.	2012.	2013.	2014.	2015.	2016.	2017.
Unmodified opinion	26	30	25	27	27	23	26
Unmodified opinion with emphasis of matter	14	8	14	10	12	12	9
Qualified opinion	6	7	6	8	4	10	9
Disclaimer of opinion		1	1	1	1	0	0
Adverse opinion					2	1	2
Σ manufacturing companies	46	46	46	46	46	46	46

Source: Authors' calculation based on disclosed audit reports (www.apr.rs), August 2018.

By analyzing previous data, it can be concluded that unmodified opinions were issued to slightly more than half of the manufacturing companies. This indicator was the lowest in 2015 and the highest in 2012. A large number of companies received unmodified opinion with an emphasis of matter, mostly in 2011 and 2013. Manufacturing companies received all three forms of modified opinion: qualified opinions had the highest share in 2016, 21.74%, disclaimer of opinion was present between 2012 and 2015, and adverse opinion appears in the last three years of the analysis. Audit firms engaged by these companies are listed in Table no. 6.

Table 6: Audit firms engaged by manufacturing companies

AUDITOR	2011.	2012.	2013.	2014.	2015.	2016.	2017.
KPMG	14	13	12	18	18	18	15
Deloitte	3	3	4	4	3	6	6
PWC	5	6	4	4	4	4	5
E&Y	1	1	1	1	2	2	3
Baker Tilly WB revizija	2	3	5	5	4	3	1
MOORE STEPHENS	2	2	2	4	3	3	3
BDO	0	0	0	0	1	2	4
The others	19	18	18	10	11	8	9
Σ manufacturing companies	46	46	46	46	46	46	46

Source: Authors' calculation based on disclosed audit reports (www.apr.rs), August 2018.

In 2011, 41% of engaged audit firms recorded one to two engagements. Manufacturing companies most often entrusted audit to KPMG audit firm, with a share of 26% to 39%. The least engaged of the members of the "Big Four" was E&Y, whose largest share was 7% in 2017. The "Big Four" covered only half of this audit market in the first two years of the analysis, while in 2016 the share was 71.43%. Such indicators point to the conclusion that the concentration of audit firms engaged in auditing is lower in the real sector than in the financial sector.

The most desirable form of unmodified auditor's opinion is a purely unmodified opinion. More than half of the total number of banks in the RS always received this opinion in all years of the analysis. The frequency of banks with unmodified auditor's opinion, according to the achieved periodic result, is shown in Table no. 7.

Table 7: Banks which received unmodified auditor's opinion according to the achieved result

NET RESULT	2011.	2012.	2013.	2014.	2015.	2016.	2017.
Loss	4	3	4	5	6	2	3
Profit	12	13	12	11	11	15	15
Σ	16	16	16	16	17	17	18

Source: Authors' calculation based on disclosed audit reports (www.apr.rs), August 2018.

Banks that have always received unmodified auditor's opinion mostly operated with profit (88.24% in 2016, 64.71% in 2015). Audit firms that issued unmodified opinions in the last year of the analysis were dominantly Deloitte and PWC, while in 2015 it was KPMG with a share of

37.5%. How the banks, which received unmodified opinion with an emphasis of matter in at least one year of the analysis, operated is given in Table no. 8.

Table 8: Banks – auditor’s unmodified opinion with an emphasis of matter/according to the achieved result

	AUDITOR’S OPINION	2011.	2012.	2013.	2014.	2015.	2016.	2017.
Loss	Unmodified opinion	1	3	5	2	3	3	2
	Unmodified opinion with emphasis of matter	2	1	0	0	0	0	0
	Σ	3	4	5	2	3	3	2
Profit	Unmodified opinion	3	2	1	4	2	2	2
	Unmodified opinion with emphasis of matter	0	1	0	0	1	1	0
	Σ	3	3	1	4	3	3	2

Source: Authors’ calculation based on disclosed audit reports (www.apr.rs), August 2018.

It can be noticed that the number of banks, which received unmodified opinion with an emphasis of matter, is small and their classification according to the achieved result is uniform. Table no. 9 provides an overview of the reasons for writing an emphasis of matter paragraph in issued auditor’s reports.

Table 9: Banks - structure of reasons for the emphasis of matter paragraph in audit reports

OVERVIEW OF REASONS	% SHARE	OVERVIEW OF REASONS	% SHARE
Volume and structure of non-performing loans	15.91%	Exposure to 1 person	5.68%
Regulatory capital	15.91%	Exposure to foreign exchange risk	4.55%
Going concern	12.50%	Investments in fixed assets and investment property	4.55%
Absence of title deed	10.23%	Capital adequacy	4.55%
Performance according to the resolution 1244	6.82%	Exposure to 2 or more persons	3.41%
Investments in non-financial entities	5.68%	Events after the balance sheet date	2.27%
		Other	7.95%

Source: Authors’ calculation based on disclosed audit reports (www.apr.rs), August 2018.

Most of the auditors wrote an emphasis of matter paragraph to the users of unmodified opinion of the audit report regarding inadequate volume and structure of non-performing loans, insufficient regulatory capital amounting to less than 10 million euros in dinar counter value on the balance sheet date and the questioning of bank’s going concern principle.

Similarly to banks, insurance companies record a high share of companies, which always received unmodified auditor’s opinion. An overview of the achieved periodic result is displayed in Table no. 10.

Table 10: Insurance companies which received unmodified auditor’s opinion/according to the achieved result.

NET RESULT	2011.	2012.	2013.	2014.	2015.	2016.	2017.
Loss	3	3	2	1	1	1	1
Profit	6	7	8	9	9	9	9
Σ	9	10	10	10	10	10	10

Source: Authors’ calculation based on disclosed audit reports (www.apr.rs), August 2018.

Insurance companies, which always received unmodified auditor's opinion, have predominantly operated with profit. Most often, this form of opinion was issued by KPMG audit firm and then by E&Y. Insurance companies which received at least one unmodified opinion with an emphasis of matter are listed in the following table.

Table 11: Insurance companies which received at least one unmodified opinion with an emphasis of matter/according to the achieved result

NET RESULT	AUDITOR'S OPINION	2011.	2012.	2013.	2014.	2015.	2016.	2017.
Loss	Unmodified opinion	4	2	2	3	3	1	2
	Unmodified opinion with emphasis of matter	1	0	4	1	0	0	0
Profit	Unmodified opinion	3	7	4	4	4	6	5
	Unmodified opinion with emphasis of matter	3	2	1	1	1	1	1
	Σ	11	11	11	9	8	8	8

Source: Authors' calculation based on disclosed audit reports (www.apr.rs), August 2018.

It can be noticed that insurance companies which operated with profit received unmodified opinion with an emphasis of matter more often than loss-making companies. Deloitte audit firm was the one that most often noticed the reason for writing an emphasis of matter paragraph in unmodified opinion. The main reasons for writing an emphasis of matter paragraph in unmodified opinion of insurance companies are listed in Table no. 12.

Table 12: Structure of the reasons for writing an emphasis of matter paragraph in insurance companies' audit reports

REASONS	% SHARE	REASONS	% SHARE
Problem with accounts receivable	5.36%	Going concern	7.14%
Problem with fixed assets	14.29%	Problems with technical reserves	8.93%
Effects of transfer prices and financial crisis	12.50%	Problems with previous financial statements	5.36%
costs of conducting insurance/ overtime supplement	39.29%	Lack of the NBS solution	3.57%
guarantee fund < capital stock	7.14%	Correction /non-existence of provisions	7.14%
Negative relevant technical result	3.57%	Inadequate information system	1.79%

Source: Authors' calculation based on disclosed audit reports (www.apr.rs), August 2018.

As regards the real sector, in sampled companies' audit reports, more than a third of them always received unmodified opinion (15/46). Table no. 13 shows how the companies operated.

Table 13: Manufacturing companies which received unmodified auditor's opinion/according to the achieved result

NET RESULT	2011.	2012.	2013.	2014.	2015.	2016.	2017.
Profit	13	13	15	13	13	12	13
Loss	2	2	0	2	2	3	2

Source: Authors' calculation based on disclosed audit reports (www.apr.rs), August 2018.

Manufacturing companies which always received unmodified auditor's opinion in all analyzed years, have operated with profit in more than 85 % of cases. KPMG audit firm was the one which most often issued unmodified opinion. In the real sector, out of 46 companies from the sample, 13 of them received at least one unmodified opinion with an emphasis of matter and they mostly operated with profit (Table 14).

Table 14: Manufacturing companies which received unmodified auditor's opinion with an emphasis of matter/according to the achieved result

	AUDITOR'S OPINION	2011.	2012.	2013.	2014.	2015.	2016.	2017.
	Loss	Unmodified opinion	1	1	2	2	4	0
Unmodified opinion with emphasis of matter		2	4	3	2	1	1	0
Σ		3	5	5	4	5	1	1
Profit	Unmodified opinion	3	5	3	3	3	7	6
	Unmodified opinion with emphasis of matter	7	3	5	6	5	5	6
	Σ	10	8	8	9	8	12	12

Source: Authors' calculation based on disclosed audit reports (www.apr.rs), August 2018.

In all years of the analysis, Deloitte audit firm was the one which most often noticed the reason for writing an emphasis of matter paragraph in auditor's report (in the last three years as much as 50%). The reasons for an emphasis of matter paragraph, which occupy the first 10 places according to their frequency, are listed in Table no. 15.

Table 15: Structure of reasons for writing an emphasis of matter paragraph in manufacturing companies

OVERVIEW OF REASONS	% SHARE	OVERVIEW OF REASONS	% SHARE
Formed mortgages	13.08%	Initiated litigation	6.15%
Given sureties	11.54%	Interpretation of tax regulations	5.38%
Overstated basic capital and non-compliance with central registry	10.00%	Need for the preparation of consolidated reports	4.62%
Accumulated loss	10.00%	Impact of financial crisis	3.85%
Short-term liabilities > Short-term receivables	10.00%	Changes in parent company	3.08%

Source: Authors' calculation based on disclosed audit reports (www.apr.rs), August 2018.

Qualified opinion is the most common form of modified auditor's opinion in banks. In addition to this form, the auditors issued disclaimer of opinion to *Srpska banka* and adverse opinion to *Univerzal banka* in 2013. An overview of modified opinions according to the achieved result is given in Table no 16.

Table 16: Banks which received qualified opinion/according to the achieved result

	AUDITOR'S OPINION	2011.	2012.	2013.	2014.	2015.	2016.	2017.
	Loss	Unmodified opinion			1	1	1	3
Unmodified opinion with emphasis of matter		2	1	2	3	1	1	1
Qualified opinion		1		1	1	2	2	1
Disclaimer of opinion				1				
Adverse opinion				1				
Σ		3	1	6	5	4	6	2
Profit	Unmodified opinion	4	3					4
	Unmodified opinion with emphasis of matter		1		2	1	1	1
	Qualified opinion	2	3	2		2		
	Disclaimer of opinion							
	Adverse opinion							
	Σ	6	7	2	2	3	1	5

Source: Authors' calculation based on disclosed audit reports (www.apr.rs), August 2018.

Qualified opinions were more often issued to banks that operated with profit compared to non-profit banks. Audit firms KPMG, Deloitte and Moore Stephens were the ones that most often stated reasons for qualified opinion, which can be systematized as follows in Table no. 17.

Table 17: Structure of reasons for qualified auditor's opinion in banks' reports

OVERVIEW OF REASONS	% SHARE	OVERVIEW OF REASONS	% SHARE
Understatement of provisions for receivables to companies in bankruptcy	32.69%	Valuation of fixed assets held for sale	7.69%
Valuation of the investments in capital	15.38%	Management of buildings (overstatement)	3.85%
Understatement of provisions for reserves	11.54%	Valuation of investment property	3.85%
Non-accounting for provisions for severance packages to employees	11.54%	Overstatement of investments	1.92%
Regulatory capital	7.69%	Cash deficit	1.92%

Source: Authors' calculation based on disclosed audit reports (www.apr.rs), August 2018.

More than one third of all reasons for writing an emphasis of matter paragraph in auditor's report relates to the understatement of provisions for receivables to companies in bankruptcy. The main risk to which banks are exposed in their business is credit risk, that is, that they will not be able to reclaim approved funds to customers. The illiquidity of bank clients and the consequences of the domino effect are the main reasons for auditors' modifications. Second important reason is the incorrect valuation of company's investment in capital, or its overstatement. Understatement of provisions for reserves and their absence when it comes to severance packages to employees are also with a two-digit relative share in the total reasons for issuing qualified opinion.

When it comes to modified opinion – disclaimer of opinion, the most common reasons are: assessment of goods received by collection of receivables, understatement of provisions for reserves, valuation of fixed assets held for sale and going concern principle. Due to the lack of adequate evidence to clarify these issues, Deloitte audit firm issued disclaimer of opinion. The most undesirable form of opinion in audit report is an adverse opinion. The reasons for issuing an adverse opinion to *Univerzal banka* in 2013 by Moore Stephens audit firm are: going concern principle and capital adequacy. The bank had an investment in capital of less than 8%, although the statutory minimum was 12%. Due to accumulated and high losses, the bank's viability was at stake, and therefore the regularity of balancing in line with going concern principle. At the beginning of 2014, the bank had lost its operating license by the NBS. Both banks operated with loss.

The only form of modified opinion in insurance companies is qualified opinion. Table no. 18 shows how the companies, which at least once received qualified opinion in the analyzed period, operated.

Table 18: Insurance companies which received qualified opinion/according to the achieved result

	AUDITOR'S OPINION	2011.	2012.	2013.	2014.	2015.	2016.	2017.
Loss	Unmodified opinion				1			
	Unmodified opinion with emphasis of matter	1	2	1	1	1		
	Qualified opinion	0	1	1	1			2
Profit	Unmodified opinion	1		1				
	Unmodified opinion with emphasis of matter	1			1	2	2	
	Qualified opinion	1	1	1				
	Σ	4	4	4	4	3	2	2

Source: Authors' calculation based on disclosed audit reports (www.apr.rs), August 2018.

Insurance companies mostly operated with loss, i.e. a smaller number of companies which operated with profit received qualified opinion. The audit companies which issued these modifications are KPMG and PWC from the “*Big Four*” and a domestic firm “*Vinčić*”. The companies which received qualified opinion have disappeared from the insurance market: they were taken over (“*AXA*” was taken over by “*Uniq*” and received this opinion in 2017), their operating license was revoked (“*Takovo*” in 2014) or they entered into the voluntary liquidation procedure (“*Metlife*” in 2016). The relative share of certain reasons for these modifications is listed in Table no. 19.

Table 19: Structure of reasons for qualified auditor’s opinion in insurance companies’ reports

REASONS	% SHARE	REASONS	% SHARE
Problem with accounts receivable	35.71%	Inadequate information system	14.29%
Problem with fixed assets	3.57%	Going concern	0.00%
Effects of transfer prices and financial crisis	0.00%	Problems with technical reserves	14.29%
costs of conducting insurance/ overtime supplement	21.43%	Problems with previous financial statements	3.57%
guarantee fund < capital stock	0.00%	Lack of the NBS solution	0.00%
Negative relevant technical result	0.00%	Correction /non-existence of provisions	0.00%
		Underestimation profit and taxes	7.14%

Source: Authors’ calculation based on disclosed audit reports (www.apr.rs), August 2018.

Inadequate treatment of receivables is the most common reason for issuing qualified auditor’s opinion, while the second most important is the lack of expense loading to cover for operating expenses in insurance. Inadequate information system in the accounting coverage of premiums and claims is the third important reason. Furthermore, the placement and structure of technical reserves is also significant reason for issuing auditor’s qualified opinion.

Modified auditors’ opinions are more frequent in sampled companies than in the financial sector (Table 20). Qualified opinion was more often issued to profit-making companies, while disclaimer of opinion to loss-making companies. Adverse auditor’s opinion was issued only to non-profit companies.

Table 20: Manufacturing companies which received modified auditor’s opinion/according to the achieved results

	AUDITOR’S OPINION	2011.	2012.	2013.	2014.	2015.	2016.	2017.
Loss	Unmodified opinion	1			3	1		
	Unmodified opinion with emphasis of matter			2	2	4	1	1
	Qualified opinion	1	1		3		3	4
	Disclaimer of opinion			1	1	1	1	
	Adverse opinion					2		2
	Σ	2	1	3	9	8	5	7
Profit	Unmodified opinion	6	9	5	4	4	1	4
	Unmodified opinion with emphasis of matter	4	1	4		2	5	2
	Qualified opinion	6	6	6	5	4	7	5
	Disclaimer of opinion		1					
	Σ	16	17	15	9	10	13	11

Source: Authors’ calculation based on disclosed audit reports (www.apr.rs), August 2018.

Overstatement of current (29.29%) and fixed assets (20%) positions are the most common reasons for the issuance of qualified auditor's opinion on manufacturing companies' financial statements. The understatement of the provision for litigation and the overstatement of sales revenue lead to the overstatement of profit or understatement of loss of the period, and account for almost 10% in the overall reasons for the issuance of qualified auditor's opinion. The first ten reasons for the issuance of the opinion, according to their frequency, are given in Table no. 21.

Table 21: Structure of reasons for auditor's qualified opinion in manufacturing companies

OVERVIEW OF REASONS	% SHARE	OVERVIEW OF REASONS	% SHARE
Overstatement of receivables	15.71%	Misstated deferred tax assets and liabilities	3.57%
Overstatement of long-term investments	8.57%	Overstatement of advances	3.57%
Overstatement of buildings	6.43%	Overstatement of inventories	4.29%
Understatement of provisions for litigation	5.00%	Overstatement of equipment	3.57%
Overstatement of sales revenues	4.29%	Absence of land title deed	3.57%

Source: Authors' calculation based on disclosed audit reports (www.apr.rs), August 2018

The reasons for issuing qualified auditor's opinion are far more diverse in manufacturing companies than in financial sector companies. Inadequate organization of costing department, overstated basic capital and non-compliance with central registry, incomplete disclosures, incorrect classification of long-term and short-term liabilities are just some of them. KPMG audit firm was the one that most often issued qualified opinion, and when it comes to domestic audit firms, those were Confida and Privredni savetnik.

Manufacturing company "Mlekara Šabac" received disclaimer of opinion for 2014 and 2015, both times by Finodit audit firm. The most common reasons for this modification are: auditor's absence during inventory listing (15.38%), overstatement of advances (11.54%), overstatement of receivables (11.54%), going concern (11.54%), activation of given sureties (7.69) and loss above the equity value (7.69%).

Adverse opinions were recorded twice in 2015 and 2017 and once in 2016. In all cases, companies operated with loss. In 2015, the companies "TeTo" Senta and "Banini", in 2016 "Victorial" and in 2017 "Victorial" and "Soja protein" received adverse opinions. In 60% of cases, going concern principle was the reason for adverse opinion, while in 40% it was overstatement of assets. Audit firms that issued adverse opinion are KPMG, Moore Stephens and in 2017 both opinions were issued by BDO.

CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis of audit reports in the financial and real sector, the following conclusions can be drawn:

1. Unmodified opinions were the least present in the real sector, i.e. modified opinions were more dominant in the real sector (24%) in relation to the financial sector (banks 3.45% in 2017, insurance companies 0% in 2017). This confirms the first hypothesis and is mostly due to the non-existence of manufacturing companies' institutional supervision.
2. The concentration of audit firms in the audit services market is higher in the financial sector than in the real sector. This is due to the necessity of the NBS's approval of the choice of auditors in the financial sector and the necessity of human resources in large audit firms.

3. The second hypothesis is partly proven. In unmodified auditor's opinions, achieved result is in correlation with periodic result. Unmodified opinions were mostly issued to profitable companies: banks (84%), insurance companies (90%) and manufacturing companies (87%) in 2017. Modified qualified opinion is not in correlation with the achieved result, since the number of companies that operated with profit and the ones that operated with loss is the same. Disclaimer of opinion and adverse opinion were always issued to non-profit companies, as accumulated losses threaten the going concern principle.
4. By analyzing the reasons for modified opinion by sectors, it is concluded that reasons are more diverse in the manufacturing sector than in the financial sector. In banks' financial sector these are: understatement of provisions for receivables to companies in bankruptcy and the valuation of investments in capital, and in insurance companies: problems with receivables and higher costs for operating expenses than expense loading. In manufacturing companies these are: the overstatement of receivables, long-term investments, buildings, sales revenues, understatement of provisions for litigations, etc., which confirms the third hypothesis.

Such conclusions, as indicated by the results of the analysis, are the outcome of the nature of operations of the companies belonging to the financial sector, where the NBS supervises the operations and imposes the need to establish and maintain a quality system of internal control. Manufacturing companies are more exposed to the risks of incorrect accounting interpretations, whose operations are not controlled by this institution. External audit of these companies, due to the lack of adequate control mechanisms – internal and external, is able to identify many irregularities that are reflected in the form of issued opinion. The future research of the authors would go towards a deeper analysis of the causes of modifications to the auditor's opinion that arise over a longer period of time.

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PERFORMANCE OF HISTORICAL VOLATILITY MODELS IN FORECASTING VOLATILITY OF SERBIAN DINAR EXCHANGE RATE

Milan Čupić¹

Abstract: Various time series volatility models that use historical information to produce volatility forecasts of exchange rates have been developed in financial literature. These are usually not based on theoretical foundations, but allow exchange rate volatility forecasting by using actual changes in historical exchange rates. The most notable of these models are historical average model, moving average model, the exponential weighted moving average (EWMA) model, autoregressive conditional heteroskedasticity (ARCH) model and generalized autoregressive conditional heteroskedasticity (GARCH) model. The paper is aimed at testing the performance of these historical time-series models in forecasting volatility of exchange rates of Serbian dinar (RSD) to euro (EUR), US dollar (USD) and Japanese yen (JPY). Forecasting performance is tested using root mean square error, where the significance of the differences in performance of alternative forecasting models is tested using Diebold-Mariano-West test. Forecasting performance is also tested by regressing the actual on the forecasted volatility series plus a constant.

Rolling window estimation methodology is employed to obtain time series of volatility forecasts. Volatility forecasts of daily changes in the foreign exchange rates are calculated using 509 daily observations on a rolling basis; i.e. the first 509 observations over the period 5 January 2009 to 31 December 2010 are used to compute an estimate for the day 510 (4 January 2011). The calculation is then rolled forward one day for 252 times using the fixed window of 509 days to forecast volatility over the period 5 January 2011 to 30 December 2011. The historical average forecasts are the only estimated using the growing window methodology; i.e. the whole sample over 5 January 2009 to period $t - 1$ is used to estimate forecast in the period t . Root mean square error model shows that the EWMA model has the smallest error in forecasting EUR/RSD, historical average model in forecasting USD/RSD, and ARCH in forecasting JPY/RSD. The results of the regression volatility forecasting methodology show that the forecast with the highest R^2 is EWMA for EUR/RSD, GARCH for USD/RSD, and ARCH for JPY/RSD. In other words, RMSE and regression test identify the same forecasting models as the best performing when it comes to EUR/RSD and JPY/RSD.

Keywords: forecasting performance, historical volatility models, Serbian dinar, exchange rate volatility.

JEL Classification: C53, F31, F37

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INTRODUCTION

Two classes of models are usually used for volatility forecasting in financial markets – time series volatility models based on the use of historical information and implied volatility models based on the use of observed option prices. Based on the survey of 66 studies (including those on currency markets) comparing different volatility forecasting models, Poon and Granger (2003) show that most studies find that implied volatility models provide better forecasts than time series models. Some authors of more recent empirical studies, on the other hand, find that time series models can offer more relevant forecasts (Ederington and Guan, 2005; Martens and Zein, 2004; Pong et al. 2004). Figlewski (1997) explains that the implied volatility forecasts may be biased representation of market expectations when arbitrage trade is hard, risky or costly to execute. He also shows that implied volatility forecasts can be affected by the bid-ask spread and discrete tick size.

The subject of research in the present paper are various historical time-series models for forecasting exchange rate volatility. The paper is aimed at testing performance of historical volatility models in forecasting volatility of exchange rates of Serbian dinar (RSD) to euro (EUR), US dollar (USD) and Japanese yen (JPY). Forecasting performance is tested using root mean square error (RMSE), where the significance of the differences in performance of alternative forecasting models is tested using Diebold-Mariano-West test. Forecasting performance is also tested by regressing the actual on the forecasted volatility series plus a constant.

Rolling window estimation methodology is employed to obtain time series of volatility forecasts. Volatility forecasts of daily changes in the foreign exchange rates are calculated using 509 daily observations on a rolling basis; i.e. the first 509 observations over the period 5 January 2009 to 31 December 2010 are used to compute an estimate for the day 510 (4 January 2011). The calculation is then rolled forward one day for 252 times using the fixed window of 509 days to forecast volatility over the period 5 January 2011 to 30 December 2011. The historical average forecasts are the only estimated using the growing window methodology; i.e. the whole sample over 5 January 2009 to period $t - 1$ is used to estimate forecast in the period t .

The results of the RMSE estimation show that EWMA is the most accurate in forecasting EUR/RSD, historical average model in forecasting USD/RSD and ARCH in forecasting JPY/RSD. Results of the Diebold-Mariano's test are, however, inconclusive and show that the differences in forecasting accuracy are rarely statistically significant. The results of the regression test of forecasting performance show that the forecasting model with the highest R^2 is EWMA for EUR/RSD, GARCH for USD/RSD, and ARCH for JPY/RSD. It can be concluded that RMSE and regression test identify the same forecasting models as the best performing when it comes to EUR/RSD and JPY/RSD.

The methodology of volatility forecasting and evaluating volatility forecasting methods could be of interest for financial managers using or generating volatility forecasts to choose and deploy techniques to hedge financial, and more specifically currency risks. The methodology could also be of interest for financial analysts and managers developing short-term financial plans relying on volatility forecasts. Finally, the results of the conducted empirical research, providing some indication of the models to be used for forecasting specific foreign exchange rates, could be of interest for investors present at or considering to enter developing financial markets like the one in Serbia.

The rest of the paper is structured as follows. Section 2 presents models for forecasting exchange rate volatility using historical time-series. Methodology employed in the paper to evaluate forecasting performance of various models is presented in section 3. Results of the study are presented in section 4. Concluding remarks follow in section 5.

VOLATILITY FORECASTING METHODOLOGY

Simplest way to forecast exchange rate volatility is to estimate variance $\sigma_t^2(\dot{s})$ (or standard deviation $\sigma_t(\dot{s})$) from historical changes in exchange rates, i.e. to use historical average or growing window model that uses the full sample data:

$$\sigma_t^2(\dot{s}) = \frac{1}{n-1} \sum_{i=1}^n (\dot{s}_{t-i} - \bar{\dot{s}})^2 \quad (1)$$

where \dot{s}_t is continuously compounded change in the exchange rate during time t ($\dot{s}_t = \ln(s_t/s_{t-1})$, where s_t is exchange rate at time t), $\bar{\dot{s}} = 1/n (\sum_{i=1}^n \dot{s}_{t-i})$ is average change in exchange rate, and n is number of historical observations (\dot{s}_t) taken into consideration for estimating $\sigma_t^2(\dot{s})$. Given that $\bar{\dot{s}}$ is relatively small when compared with $\sigma_t(\dot{s})$, especially for high frequency time series (daily or weekly) (Hull, 2000, p. 369), $\bar{\dot{s}}$ is often assumed to be equal to zero, while formula for $\sigma_t^2(\dot{s})$ becomes:

$$\sigma_t^2(\dot{s}) = \frac{1}{n} \sum_{i=1}^n (\dot{s}_{t-i})^2 \quad (2)$$

Figlewski (1997) argue that sample mean is very inaccurate estimate of the true mean, especially for small samples, so the use of formula (2) can increase volatility forecast accuracy. On the other hand, Andersen and Bollerslev (1998) argue that formula (2) provides very noisy proxy for true daily volatility, and propose the use of daily variance calculated from intra-daily data (e.g. sum of squared hourly changes in exchange rates).

Model presented in formula (2) views volatility as constant over time (the homoskedasticity assumption) and, therefore, puts constant weights on all past observations. If volatility clusters and depends upon its history (the heteroskedasticity assumption), more recent observations provide more information about current volatility and should be given more weight. This leads to the moving average or rolling window model:

$$\sigma_t^2(\dot{s}) = \sum_{i=1}^n w_i \dot{s}_{t-i}^2 \quad (3)$$

where w_i is weight given to the observation i days ago. Weights are positive ($w_i > 0$), sum to unity ($\sum_{i=1}^n w_i = 1$), and are greater for more recent observations. Special case of this model is the exponentially weighted moving average (EWMA) model, where exponentially declining weights are given to past observations. More precisely, $w_{i+1} = \lambda w_i$, where λ is decay factor which takes value between zero and one. EWMA can be written as follows:

$$\sigma_t^2(\dot{s}) = (1 - \lambda) \sum_{i=1}^n \lambda^{i-1} \dot{s}_{t-i}^2 + \lambda^n \sigma_{t-n}^2 \quad (4)$$

When n is very large, the term $\lambda^n \sigma_{t-n}^2$ becomes very small and can be ignored. The value of λ determines how sensitive $\sigma_t^2(\dot{s})$ is to the most recent observations - high value of λ results in $\sigma_t^2(\dot{s})$ that slowly responds to the most recent observations. J.P. Morgan/Reuters (1996) produces its RiskMetrics volatility forecasts by using two optimal decay factors; one for the daily data with value of 0.94, and one for the monthly data with value of 0.97. These values are found to be optimal because they minimize root mean square error (RMSE) of volatility forecasts.

Engle (1982) developed the autoregressive conditional heteroskedasticity (ARCH) model for estimating and forecasting variance as a time-varying function of current information (at time $t - 1$). Exchange rate changes \dot{s}_t can be broken up into two parts: 1) predictable part represented

by conditional mean of \hat{s}_t , $E(\hat{s}_t) = \mu_t$, where E reflects conditioning on the information available at time $t - 1$; and 2) unpredictable part represented by residual term, ε_t .

$$\hat{s}_t = \mu_t + \varepsilon_t \quad (5)$$

It is usually assumed that ε_t is independently distributed with unconditional (constant) variance $V(\varepsilon_t) = \sigma^2$ and unconditional mean $E(\varepsilon_t) = 0$. ARCH assumes that variance of the residual term is not constant, but conditional on past data. Under the usual assumption that ε_t is normally distributed with zero mean, conditional variance h_t is function of a distributed lag on the squared residual terms from previous periods. Specifically, ARCH(q) specification involves q lagged residual terms:

$$h_t = w_0 + \sum_{j=1}^q w_j \varepsilon_{t-j}^2 \quad (6)$$

where $w_0 \geq 0$ and $w_j \geq 0$. Conditional mean equation is necessary for the full ARCH(q), and can take any form, but usually $\hat{s}_t = \alpha + \beta'X_t + \varepsilon_t$, where β is a vector of coefficients, X_t is a vector of explanatory variables, and $\varepsilon_t | \Omega_t \sim (0, h_t)$.

Brooks (2014, p. 428) notes that ARCH have been rarely used in last decade because of the difficulties with estimating the value of q and problems that may arise when q is very large. According to Engle (1995, p. XII) one of the drawbacks of ARCH specification is that it looks more like a moving-average specification than an autoregression because h_t is a moving average of squared residuals. A model which includes autoregressive term (lagged conditional variances) is generalised ARCH (GARCH) developed by Bollerslev (1986). It explains variance by two distributed lags: 1) past squared residuals to capture high frequency effects, and 2) lagged values of the variance, to capture longer term influences (Figlewski, 1997). The general GARCH(p, q) has the following form:

$$h_t = w_0 + \sum_{i=1}^p \theta_i h_{t-i} + \sum_{j=1}^q w_j \varepsilon_{t-j}^2 \quad (7)$$

where $w_0 > 0$, $\theta_i \geq 0$ and $w_j \geq 0$. Unconditional variance (long-term average value of the conditional variance) of ε_t is constant and given by:

$$V(\varepsilon_t) = \frac{w_0}{1 - \sum_{i=1}^p \theta_i - \sum_{j=1}^q w_j} \quad (8)$$

as long as $\sum_{j=1}^q w_j + \sum_{i=1}^p \theta_i < 1$. It follows that conditional variance converges upon the unconditional variance as the forecast horizon increases, i.e. conditional variance exhibits mean reversion with a reversion level $V(\varepsilon_t)$ and a reversion rate $1 - \sum_{i=1}^p \theta_i - \sum_{j=1}^q w_j$ (Hull, 2000, pp. 379-380). When $\sum_{j=1}^q w_j + \sum_{i=1}^p \theta_i \geq 1$ variance $V(\varepsilon_t)$ is not defined, i.e. coefficients imply non-stationarity in variance. The most commonly used GARCH model is GARCH(1, 1) model which can be written as follows:

$$h_t = w_0 + \theta_1 h_{t-1} + w_1 \varepsilon_{t-1}^2 \quad (9)$$

When $\theta_1 + w_1 = 1$ and $w_0 = 0$, GARCH(1, 1) reduces to EWMA, where θ_1 corresponds to λ . It follows that EWMA is non-stationary version of GARCH(1, 1) where the unconditional variance of the variance process is undefined (there is no finite fourth moment).

Boudoukh et al. (1997) find that EWMA provides more accurate U.S. short-term interest rate volatility forecasts than simple standard deviation, while GARCH(1, 1) forecasts are the least

accurate. Ederington and Guan (2005), on the other hand, across nine markets, find that GARCH(1, 1) generally provides better volatility forecasts than EWMA and simple standard deviation, while EWMA usually performs the worst, especially at the longer horizon forecasts. Yu (2002) finds that 1) GARCH(3, 2) model is the best in ARCH family and provides accurate forecasts, 2) simple historical average model is less accurate, but generally provides better forecasts than GARCH(1, 1), and 3) EWMA and ARCH do not perform well in the New Zealand stock market. Hansen and Lunde (2005) find that GARCH(1, 1) is superior to other models in ARCH family in forecasting exchange rates volatility, but inferior in forecasting IBM returns.

FORECAST EVALUATION

Volatility forecasting accuracy is often estimated using simple measures like Mean square error (MSE), Root Mean Square Error (RMSE) and Mean absolute error (MAE). Average forecast error of forecasting methods analyzed in this paper is determined using RMSE, which is calculated as follows:

$$RMSE = \sqrt{\frac{1}{n} \sum_{t=1}^n (\sigma_t^2 - \hat{\sigma}_t^2)^2} \quad (10)$$

where σ_t^2 and $\hat{\sigma}_t^2$ are, respectively, actual (realized) and forecasted volatility at time t , and n is total number of forecasts. The method providing smallest RMSE is considered to be the most accurate. To compare the statistical significance of the RMSEs Diebold-Mariano-West test is used (Diebold, Mariano, 1995; West, 1996).

Forecast error can also be estimated using the following regression test:

$$\sigma_t^2 = \beta_0 + \beta_1 \hat{\sigma}_t^2 + \varepsilon_t \quad (11)$$

Pagan and Schwert (1990) note that the volatility forecasts are unbiased if β_0 is approximately 0 and β_1 is close to 1. Boudoukh et al. (1997) add that β_1 is downward biased if the forecast contains estimation error, while deviations of β_1 from 1 reflect a combination of estimation error and systematic over- or underestimation. Poon and Granger (2003) argue that biased forecast can have predictive power if the bias can be corrected, while unbiased forecast is useless if forecast errors are large. For $\hat{\sigma}_t^2$ to be considered as a good forecast R^2 for the regression should tend to 100 percent.

Subject to evaluation in this paper are volatility forecasts of the euro (EUR), US dollar (USD) and Japanese yen (YEN) exchange rates against Serbian dinar (RSD). Actual volatility in period t is estimated as a squared daily exchange rate change in period t . Volatility forecasts of daily changes in the exchange rates are calculated using historical average, moving average, EWMA, ARCH(1) and GARCH(1,1) model.

Rolling window estimation methodology is employed to obtain time series of volatility forecasts. Volatility forecasts of daily changes in the foreign exchange rates are calculated using 509 daily observations (trading days) on a rolling basis; i.e. the first 509 observations over the period 5 January 2009 to 31 December 2010 are used to compute an estimate for the day 510 (4 January 2011). The calculation is then rolled forward one day for 252 times using the fixed window of 509 days to forecast volatility over the period 5 January 2011 to 30 December 2011. The historical average forecasts are the only estimated using the growing window methodology; i.e. the whole sample over 5 January 2009 to period $t - 1$ is used to estimate forecast in the period t .

ARCH tests proposed by Engle (1982) were conducted to examine if the series under study have ARCH effects. The tests show that ARCH effects are present in daily percentage changes of analyzed foreign exchange rates. Focus in the paper is restricted to commonly used ARCH-type forecasting models. These are ARCH(1) and GARCH(1,1), which are estimated daily given each day's previous 509-day history.

EVALUATION OF VOLATILITY FORECASTING METHODS

Table 1 presents the results of evaluation and comparison of alternative volatility forecasting models using RMSE methodology presented in formula 10, as well as Diebold-Mariano-West test.

Table 1. Comparison of volatility forecasting methods using the RMSE

EUR/RSD	RMSE	DMV
Historical average	0,0000421	-1,3177
Moving average	0,0000431	-1,7025
EWMA	0,0000404	-
ARCH	0,0000505	-2,3311*
GARCH	0,0000416	-1,2212
USD/RSD		
Historical average	0,0001082	-
Moving average	0,0001087	-0,5371
EWMA	0,0001093	-1,0908
ARCH	0,0005148	-1,1343
GARCH	0,0001726	-2,6980**
JPY/RSD		
Historical average	0,0001846	-1,7461
Moving average	0,0001842	-1,3702
EWMA	0,0001864	-2,0231*
ARCH	0,0001805	-
GARCH	0,0001814	-0,6385

Notes: RMSE stands for root mean square error; column DMV contains t statistics of the Diebold-Mariano-West test; empty fields in the column DMV are for volatility forecasting models chosen to be benchmark models; statistically significant at 1% (**) and 5% (*).

Source: Author

Table 1 is divided into three panels presenting the results for three exchange rates – EUR/RSD, USD/RSD and JPY/RSD. Diebold-Mariano-West test reveals only three statistically significant differences in predictive power of volatility forecasting models as measured by RMSE. This makes the choice of the model with the largest predictive power very hard. Generally, EWMA has the lowest error of forecasting EUR/RSD, but is significantly more accurate only when compared to ARCH. Historical average model is the best performing when it comes to forecasting USD/RSD, but is only significantly more accurate than GARCH. Finally, ARCH has the lowest error of forecasting JPY/RSD, but is significantly more accurate only when compared to EWMA. The smallest differences in the RMSE of forecasting models are reported for JPY/RSD.

Table 2 presents the results of evaluation and comparison of alternative volatility forecasting models using regression methodology presented in formula 11. Table is divided into three panels presenting the results for three exchange rates – EUR/RSD, USD/RSD and JPY/RSD. The R^2 s of the regression model are low but not very different from the R^2 s reported in some previous studies (e.g. Pagan and Schwert, 1990; Day and Lewis, 1992). The forecast with the highest R^2 is EWMA for EUR/RSD, GARCH for USD/RSD, and ARCH for JPY/RSD. It can be concluded

that RMSE and regression test identify the same forecasting models as the best performing when it comes to EUR/RSD and JPY/RSD.

Table 2. Comparison of volatility forecasting methods using the regression model

EUR/RSD	β_0	β_1	R^2
Historical average	0.0000 (0.1951)	1.0164 (0.4840)	0.0009
Moving average	0.0000 (2.2234)	-0.3571 (-0.328)	0.0004
EWMA	0.0000 (1.1574)	0.7613 (4.2026)	0.0657
ARCH	0.0000 (5.5075)	0.1963 (2.7730)	0.0297
GARCH	0.0000 (2.9068)	0.5141 (3.9175)	0.0576
USD/RSD			
Historical average	0.0010 (1.7995)	-12.0384 (-1.6672)	0.0110
Moving average	0.0001 (1.1375)	-0.5215 (-0.3525)	0.0005
EWMA	0.0001 (2.3485)	0.2073 (0.6483)	0.0017
ARCH	0.0001 (10.4630)	-0.0079 (-0.5782)	0.0013
GARCH	0.0001 (6.5078)	0.1053 (2.1746)	0.0185
JPY/RSD			
Historical average	0.0017 (2.0208)	-13.2961 (-1.8996)	0.0142
Moving average	0.0003 (1.9743)	-2.4319 (-1.3898)	0.0076
EWMA	0.0003 (1.9743)	-0.0360 (-0.0989)	0.0000
ARCH	0.0000 (0.0501)	1.0123 (2.9452)	0.0334
GARCH	0.0000 (0.3373)	0.9223 (2.4960)	0.0242

Notes: β_0 and β_1 are parameters of the regression model for estimating forecast error presented in formula 11; R^2 is coefficient of determination of the model presented in formula 11; t-statistics are in the brackets.

Source: Author

CONCLUSION

The subject of research in the present paper are various historical time-series models for forecasting exchange rate volatility. These are historical average method, moving average model, the Exponential weighted moving average (EWMA) model, autoregressive conditional heteroskedasticity (ARCH) model and generalized autoregressive conditional heteroskedasticity (GARCH) model. The paper is aimed at testing performance of these models in forecasting volatility of exchange rates of Serbian dinar (RSD) to euro (EUR), US dollar (USD) and Japanese yen (JPY).

The results of the RMSE estimation show that EWMA is the most accurate in forecasting EUR/RSD, historical average model in forecasting USD/RSD and ARCH in forecasting JPY/RSD. Results of the Diebold-Mariano-West test are, however, inconclusive and show that the differences in forecasting accuracy are rarely statistically significant. The results of the regression test of forecasting performance show that the forecasting model with the highest R^2 is EWMA for EUR/RSD, GARCH for USD/RSD, and ARCH for JPY/RSD. It can be concluded that RMSE and regression test identify the same forecasting models as the best performing when it comes to EUR/RSD and JPY/RSD.

The paper contributes to finance literature by providing short summary on the standard historical time-series models used for volatility forecasting. It indicates some of their advantages and disadvantages, and makes the choice of appropriate forecasting model more straightforward. Methodologically, it presents simple procedure and rules for evaluating performance of volatility forecasting models. Empirically, paper gives some indications on the most accurate models for forecasting foreign exchange rates changes in Serbian financial markets.

There are some limitations to the research conducted in the paper. Actual volatility in the research is defined as the squared daily change in foreign exchange rates. This can be problematic given that such an estimate can be very noisy. Future research could investigate squared weekly changes in foreign exchange rates, or estimate daily changes as average intraday changes in foreign exchange rates. In addition, the results could have been affected by the global financial crisis. Therefore, future research of volatility forecasting models could take this influence into consideration by dividing the time series of data in several subsamples or use of models such as Markov-Switching.

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THE ASSESSMENT OF ENTREPRENEURS' FINANCIAL PERFORMANCE IN THE REPUBLIC OF SERBIA

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Abstract: *In a transition economy, small business and entrepreneurial firms are generally regarded as a driving force of economic development, employment improvement and for poverty reduction, as well. Thus, measuring the performance of the entrepreneurial firms has become the very important issue in the area of business economics and management. This is especially the case in order to achieve their sustainability in the long term. In that sense, it is very important to select the reliable measures of performance, financial or non-financial or both taking into consideration all the advantages and disadvantages of objective traditional financial and subjective, non-financial performance measures. The main objective of the paper is to assess the entrepreneurship performance in the Republic of Serbia considering, above all, the financial ones. After a long-term decline in economic activities and non-profitable operation, the Serbian economy left the recession road in 2015 and moved into a profitable business zone. This conclusion can be argued by the fact that the largest number of business entities in the Republic of Serbia achieved a profit in 2016 and 2017. These positive economic flows at the macro level also reflected on the business of entrepreneurs in that period. The increased level of entrepreneurial ventures profitability was conditioned by increased volume of their activities. Although the level of losses of entrepreneurs reduces from year to year, more than 20 percent of these business entities still face the problem of unprofitable operation. While a large number of entrepreneurs operate profitable, most of them face the problem of timely liabilities settlement. The total liabilities of entrepreneurs are not only high, but they are also characterized by a very bad maturity structure. Namely, in the structure of the entrepreneurs' liabilities dominate short-term liabilities that have to be settled in a year. In order to timely identify these problems, it is necessary to conduct an analysis of their financial position and performance. Timely identified problems, based on accounting information, will enable entrepreneurs to overcome them in the following period. Hence, the paper discusses about the financial performance of entrepreneurs in the Republic of Serbia, the role of bookkeeping and financial reporting data in their achievements evaluation, as well as specific regulation of these business entities.*

Keywords: *Entrepreneurship, Performance measurement, Financial measures, Regulation*

JEL Classification: *D13, M13, M21, M41*

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INTRODUCTION

Entrepreneurship and entrepreneurship are one of the important factors that influence the economic development of a country and which, due to the light adaptability to market changes, represent the most important part of its economy (Dostić, 2003). Entrepreneurs are an important segment both for the creators of European economic policy, as well as for the domestic economic legal system. As a factor of stability of economy, they are also the most important part of transitional economies (Knežević, 2010, 2009).

Entrepreneurship, viewed as the organization of market-oriented business activities whose ultimate aim is to achieve profit, is an interdisciplinary scientific field that deals with the laws of private equity investment (Knežević, 2011). The term *entrepreneurship* also refers to an individual who independently or in a group performs economic activities, either through the establishment of a new entity or the development of an existing business entity. An entrepreneur is a business-capable physical person who performs economic activity in order to obtain profit (Hisrich, Peters and Shepherd, 2011). The obligations incurred in this business correspond to the total of their own assets (Vasiljević, 2011). Previously, the private entrepreneurship played an important role in the domestic economic environment due to the importance of private ownership in relation to other forms of ownership (Knežević, 2012). By moving to a market economy, an individual trader from a comparative right called "private entrepreneur" or "entrepreneur" is returned to the economic legal system of the Republic of Serbia. The Constitution of the RS in 2006, as the highest legal act of a country, guarantees private, cooperative and public property, so that the entrepreneur, after a long period of time, returns to the economic legal system of the Republic of Serbia as an important economic entity.

In order to eliminate the difficulties of entrepreneurs' business arising from unfair competition and grey economy, the domestic legislator has resorted to a different arrangement of the subject area, compared to the earlier one. Although the updated legislative regulation, which has many advantages over the previous one, the adoption of a special Law on Entrepreneurs for the Republic of Serbia would be a step forward in the direction of strengthening the market economy, through better regulation of the position of entrepreneurs and entrepreneurial activity. With the new mechanisms, it should be possible for an individual to more effectively deal with business activity. An entrepreneur is not a legal entity, but an individual who has a license to perform certain economic activity.

The essence of entrepreneurship research is to examine why some individuals start a venture, whereas others do not (Baron and Markman, 2003; Shane and Venkataraman, 2000). Numerous studies were mostly static and neglected the process nature of new venture formation (Kessler and Frank, 2009). There is still not enough knowledge about all possible outcomes of entrepreneurial process as well as the mere its context. Starting a business depends on circumstances and experiences during the entrepreneurial process (Zapkau *et al.* 2017; Katz, 1992). Zapkau *et al.* (2017) examine the way prior literature considered the influence of prior entrepreneurial exposure on the entrepreneurial process by different characteristics of the process (the theoretical mechanism underlying the entrepreneurial process), the individual (characteristics of the person involved in the entrepreneurial process), the environment (situational factors influencing the entrepreneurial process), and the organization (characteristics of the new venture).

Since in a transition economy, small business and entrepreneurial firms are generally regarded as a driving force of economic development, employment improvement and for poverty reduction, as well, hence the subject of the research is the assessment of the entrepreneurs' financial performance in the Republic of Serbia. The main objective of the paper is to assess the entrepreneurship performance in the Republic of Serbia considering, above all, the financial

ones. The paper is structured into several sections. After the introduction, there is the second section, which is devoted to the assessment of the performance of any entity in a modern business environment. The third one describes the legislative framework of business of entrepreneurs in the Republic of Serbia. The fourth section analyses the profitability and liquidity of entrepreneurs in the Republic of Serbia. Finally, there are some specific conclusions and recommendation for further entrepreneurial development in the Republic of Serbia.

ASSESSMENT OF THE PERFORMANCE OF THE ENTITIES IN A MODERN BUSINESS ENVIRONMENT

In a modern business environment, managers are increasingly developing and implementing a performance measurement system for the entity's overall sustainability in order to plan, control and report, so that their commitment to all stakeholders would be increased. The goal of each business entity is to achieve as much financial performance as possible (which includes the best possible value for its owners). Often, this implies the inclusion of non-financial performance (value for other interest groups, for example, employees, customers and society). Non-financial performances (and value for stakeholders) are mainly focused because they include strong predictors of future financial performance (and value for shareholders). Good integration of financial and non-financial performance leads to so-called business excellence. The most widely used model in Europe for achieving business excellence is the EFQM model of excellence (Kristensen and Westlund, 2004). The significant alternative approaches include the Baldrige Model (commonly used in the United States) and the Kanji business excellence model (for example, Kanji & Wallace, 2000; Kanji, 1998). The degree of business excellence could be manifested by different indicators. EFQM business excellence, for example, is measured by the evaluation criteria for the European Quality Award (EQA). Many empirical studies have shown that non-financial criteria in business excellence affect financial performance (Kristensen and Westlund, 2004; Anderson *et al.* 1994). However, regardless of the benefits of business excellence, many organizations do not apply its postulates in a systematic way, as there is no sustainable business excellence. This is due to insufficient evidence that benefits (better financial performance) outweigh shortcomings (bureaucracy, costs, inflexibility, etc.). Kristensen and Westlund (2004) point out that there is a significant untapped potential for the impact of business excellence on financial performance due to suboptimal implementation of the idea of business excellence. This means that managers should implement a responsible business performance measurement, which implies responsibility for data and information quality, setting target values (standards) and verification of the obtained results. In addition, the measurement of non-financial processes should be designed as part of a structural context, a causal and consequential measurement model that links the main causes and consequences, which is rarely achieved in practice.

As to the performance reporting, generally, there could be distinguished financial and non-financial benchmarks, as well as leading and lagging indicators. Kotane (2012) discusses the role of the analysis of financial and non-financial indicators in performance assessment of the entity and concludes that the analysis of financial indicators is carried out more on a regular basis, unlike the analysis of non-financial indicators. In general, Kotane (2012) concludes that the analysis of financial and non-financial indicators is not significant or it is very difficult to answer this question. Šobota and Peljhan (2012) examine the significance of different perspectives in integrated performance measurement systems. The results of their study confirm that non-financial criteria can be grouped according to the proposed nonfinancial perspective (in line with the BSC model). The significance of some perspectives varies among entities that implement integrated performance measurement models and entities that do not use such systems, although this difference is statistically significant only for the financial perspective and perspective of learning and growth. Moreover, the results indicate that different perspectives are not weighted

equally, and the weighing bias is greater for entities that implement integrated performance measurement models in relation to entities that do not apply such models.

Taylor and Taylor (2013) examine how the six organizational factors influence the effectiveness of the implementation of the performance measurement system, namely: the process of strategy formulation, the process of strategy implementation, the support of the information system, the leadership of higher management, the orientation of organizational learning, the quality of managerial culture. The conclusion is that the factor with the greatest influence on the effective implementation of the performance measurement model is the process of implementation of the strategy. The leadership potential of senior management, the orientation of organizational learning and the quality of managerial culture have a smaller, but still significant, impact. Kloviene (2013) points out that improving the performance measurement system is in line with the business environment, that is, it is very important to adjust the system of performance measurement to the business environment and to make improvements to the model in accordance with the requirements of the business environment.

Stančić, Čupić and Stančić (2012) speak about the choice of performance measurement system in a value-oriented entity for shareholders. They conclude that entities need to rely on a performance measurement system in order to meet different information requirements, to allow the assessment of the efficiency of the use of limited resources and to assess the contribution of employees, managers and individual organizational units to the implementation of the overall objective of the entities.

Domanović (2010) points out that the traditional assessment of the entity's performance dominates in the Republic of Serbia, i.e. the financial performance measures calculated according to the official financial statements. A few entities make the integrated performance measurement model, such as Balanced Scorecard model. The managers of big companies, not to mention the small business and entrepreneurs, are still not aware of the significance of the non-financial measures in the process of entity's efficiency evaluation.

LEGISLATIVE FRAMEWORK OF BUSINESS OF ENTREPRENEURS IN THE REPUBLIC OF SERBIA

In the Republic of Serbia, earlier legal solutions, the matter of private entrepreneurs was regulated by a special law, by which the entrepreneur was designated as a natural person registered in the Register of Economic Entities and who, in the form of a profession for the purpose of gaining profit, performs legally permissible activities, including artistic and old crafts and domestic work (*Zakon o privatnim preduzetnicima* - Law on Private Entrepreneurs, 35/2002). The legal position of the entrepreneur was previously regulated by laws such as: Law on Private Entrepreneurs, Law on Enterprises (*Zakon o privatnim preduzetnicima, Zakon o preduzećima*, 35/2002; 29/1996 and 54/1989). The entrepreneur is partially regulated in the Law on Obligations (*Zakon o obligacionim odnosima*, 35/2002, 29/1996).

Domestic regulations for the first time regulate the matter of companies and entrepreneurs with a single legal text. The Companies Act of 2011 (*Zakon o privrednim društvima* – Company Law, 5/2015, 83/2014, 36/2011 and 99/2011) defines the legal concept of a company and an entrepreneur. An economic entity is defined as a legal entity performing economic activity for the purpose of gaining profit, and an entrepreneur as a business-capable natural person performing activity for the purpose of generating income and registered as such (*Zakon o privrednim društvima* - Company Law, Article 83). According to the Law, the entrepreneur is a physical person registered in a special register, which performs the activity of a free profession, regulated by a special regulation, if that is prescribed by that regulation. Under the previous law, the entrepreneur is designated as a natural person who, in the interests of acquiring the profits,

performs all economic activities permitted by law, including old crafts and domestic work (Knežević, 2011, 140).

An entrepreneur is registered indefinitely or for a limited time, and the entrepreneur may be only the person with business capacity. Special regulations may specify the conditions that must be fulfilled by the person who wishes to engage in entrepreneurship (conditions in terms of professional qualifications, health status and age, business premises, equipment, etc.). An entrepreneur performs business activity under a business name. For the obligations arising from the performance of the activity, the entrepreneur responds with all his property, and therefore, the property he did not enter into the entity (Vasiljević, 2011).

The entrepreneur will cease performing the activity by withdrawal or by force of law due to death or permanent loss of business ability; by the expiration of time, if the activity is registered for a specified time; if his business account has been blocked for more than two years, on the basis of a request for deletion of entrepreneurs from the register submitted by the National Bank of Serbia or the Tax Administration; if the legally valid decision establishes the nullity of registration of an entrepreneur; if by a final decision of the competent authority or court of honour of the chamber in which the imposed measure of prohibition of performing activity is imposed; in the case of termination of validity of approval, approval or other act of the competent authority, which is prescribed by a special law as a condition for registration; in other cases prescribed by law.

An entrepreneur may make a decision to continue performing business activity in the form of a company, whereby the provisions of the law on the establishment of the company's date are applied accordingly. On the basis of this decision, there is carried out simultaneous deletion of entrepreneurs from the register of economic entities and registration of the establishment of a company that takes over all the rights and obligations of the entrepreneur arising from business until the moment of establishment of that company. In order to facilitate the business of entrepreneurs, the existing legislation still does not provide the sufficient guarantees for successful development of entrepreneurial activity in the Republic of Serbia, because there is still unfair competition, insufficient control by the competent institutions, illegal business flows, high taxes and duties and so forth. A separate law that would regulate exclusively the subject matter of entrepreneurs should provide mechanisms that enable the individual to successfully pursue business activities with tax and procedural relief.

PROFITABILITY AND LIQUIDITY OF ENTREPRENEURS IN THE REPUBLIC OF SERBIA

In the literature on accounting, the financial performance syntax is not interpreted in the same way. In the narrower sense financial performance refers to the profitability of a business entity (Peterson-Drake and Fabozzi, 2012). According to a broader interpretation, other indicators such as liquidity, solvency and activity (Cotter, 2012) are used also to assess the achievements of entities. Due to the spatial limitations, our intention is not to consider all relevant financial indicators for the assessment of the entrepreneurs' business. Therefore, in this part of the paper, emphasis will be placed on profitability and liquidity as two key financial performances.

Dynamic analysis of the entrepreneurs' key financial performance in the Republic of Serbia has been carried out for 2016 and 2017. Liquidity and profitability of these business actors were identified on the basis of the analysis of aggregated data from their financial statements. Relevant available data on the official website of Serbian Business Registers Agency (www.apr.gov.rs) has been used to obtain a complete picture of key financial performances of these entities in the country. The Financial Statements Annual Bulletin for 2017 was available to the public on the above-mentioned internet site, at the time of data collection for the analysis. The financial data

for 2016, also shown in the same Bulletin, has also been used for the purpose of dynamic analysis. However, for the purposes of the analysis of global profitability indicators, some data from 2015 was also used.

Due to the impossibility of presenting an integral information base from these Bulletins for the purpose of profitability analysis, the structure of income, expenses, operating result, results from financing, as well as the amount of net result were presented separately for 2017 and 2016.

Table 1: Entrepreneurs' income and expense for 2017 and 2016. - amounts in RSD 000 -

ITEMS	2017.	2016.	Index
Total income	242.482.515	226.836.207	106,9
Total expenses	231.368.730	216.943.870	106,6
Operating income	236.873.401	222.001.364	106,7
Operating expenses	226.596.275	212.376.437	106,7
Operating profit	13.482.803	12.477.810	108,1
Operating loss	3.205.677	2.852.883	112,4
Financial income	2.203.372	1.806.634	122
Financial expenses	1.610.027	1.568.546	102,6
Profit from financing	1.290.701	1.131.205	114,1
Loss from financing	697.356	893.117	78,1
Net profit	9.165.138	8.439.550	108,6
Net loss	1.296.391	1.144.774	113,2
Positive net result	7.868.747	7.294.776	107,93

Source: Authors' calculations

The economic recovery of the Serbian economy, which was marked in 2016 and 2017, is especially evident in the business of entrepreneurs. Based on the presented absolute amounts of different levels of results, it can be concluded that most of the entrepreneurs have been successful in doing their business. The positive net result of this category in 2017, compared to the previous year, was increased by approximately 8%.

By creating a positive net result of RSD 7,869 million, the entrepreneurs continued their profitable operation in 2017. The majority of entrepreneurs (13,778) were positively doing their business in 2017. Their total net profit of RSD 9,165 million was recorded annual growth of 8.6%. In 2016 only 5.084 entrepreneurs were doing business positively. On the other hand, a great number of entrepreneurs showed net loss in 2017, which is 13,2% higher than the previous year. The largest number of entrepreneurs recorded not only a positive net result, but also achieved a positive operating result (the difference between revenues and operating expenses). However, one should bear in mind the fact that 5.160 entrepreneurs reported net loss, out of which 3.313 showed losses above equity. At the end of 2017, total loss of entrepreneurs, was in the amount of RSD 1.296 million and it has been increased by 6.4% in comparison with the previous year.

In addition to the absolute indicators of successful business, relative indicators (partial and global) are used to monitor profitability. Partial indicators (operating profit margin and net profit margin) are determined on the basis of the income statement. Global profitability indicators are determined on the basis of both the income statement and the balance sheet. The relevant data for their identification and the profitability ratios are shown in Table 2.

Table 2: Profitability ratios and items for their computing - amounts in RSD 000 -

ITEMS	2017.	2016.
Operating income	236.873.401	222.001.364
Operating expenses	226.596.275	212.376.437
Operating result	10.277.126	9.624.027
Net profit	9.165.138	8.439.550
Net loss	1.296.391	1.144.774
Net result	7.868.747	7.294.776
Sales (Revenue)	234.747.671	220.167.492
Operating profit margin	4,38%	4,37%
Net profit margin	3,35%	3,31%
Average assets	112.901.920	101.501.643
ROA	9,10%	9,48%
Average equity	35.266.026	31.976.098
ROE	22,31%	22,8%

Source: Authors' calculations

The relevant balance sheet items for identifying the entrepreneurs' liquidity are shown in Table 3. Key liquidity indicators are also shown in the same table.

Table 3: Entrepreneurs' liquidity - amounts in RSD 000 -

ITEMS	2017	2016	Index
Current assets	83.912.668	77.123.305	112,1
Inventories	39.845.167	36.495.516	110,9
Cash	11.960.089	10.454.796	123,2
Short-term liabilities	74.044.434	69.428.900	104
Liquidity indicators			
Net working capital	9.868.229	7.694.405	128,2
Current Ratio	1,13	1,11	
Quick or Acid-Test Ratio	0,56	0,72	

Source: Authors' calculations

Both relative indicators of liquidity are not its adequate barometers. The numerator of the first indicator contains inventory which may not be truly liquid. The numerator of Quick Ratio may contain inferior quality accounts receivable. On the basis of identified coefficients of both general and reduced liquidity, obtained by putting in relation to relevant balance sheet aggregates, a satisfactory liquidity situation was not determined in the observed period. In this

period financial structure of entrepreneurs was extremely unfavourable. Moreover, the amount of total liabilities increased. While short-term liabilities were increased by 4%, long-term liabilities increased by 23%. In both observed years, the share of liabilities in the financial structure was around 69 percent. This fact points to the high indebtedness of the entrepreneurs. The total liabilities of entrepreneurs were not only high, but they were also characterized by a very bad maturity structure. Namely, in the structure of the entrepreneurs' liabilities dominated short-term liabilities that have to be settled in a year. The largest part (88.0%) of total debt consisted of short-term liabilities in the amount of RSD 74.044 million, and more than half (RSD 38.602 million) refers to liabilities from operation. In 2017, significant short-term financial liabilities amounted to RSD 21.539 million and were by 12.5% higher than in the previous year.

In 2017, entrepreneurs had positive net working capital, which was increased by more than a quarter over a period of one year and amounted to RSD 9,868 million. Despite the continuous growth in positive net working capital, entrepreneurs continued to have insufficient long-term capital to carry out their business activities.

CONCLUSIONS AND RECOMMENDATIONS

In a transition countries entrepreneurs are generally represent a driving force of economic development. Hence, measuring the performance of these business actors has become the very important issue in the transition economy. The assessment of entrepreneurs' performance is primarily based on the financial information in the Republic of Serbia.

The largest number of entrepreneurs in the Republic of Serbia achieved a profit in 2016 and 2017. Although the number of entrepreneurs who made losses decreased in the observed period, more than 20 percent of these business entities still face the problem of unprofitable operation. A large number of entrepreneurs face the problem of timely liabilities settlement. Their total liabilities are not only high, but they are also characterized by a very bad maturity structure. In the structure of the entrepreneurs' liabilities dominate short-term liabilities.

The above data show that a large number of entrepreneurs in the Republic of Serbia face certain problems, which call into question the achievement of their primary goal. Since the main goal of the entrepreneur is to achieve maximum profitability with optimal liquidity (financial equilibrium), in order to timely perceive these problems it is necessary to conduct an analysis of their financial position and profitability. Timely identified problems based on accounting information will enable entrepreneurs to easily overcome them in the following period.

Thus, the entrepreneurs should be educated and make them possible to properly use accounting information in decision making. Since the key problem of the entrepreneurs is the illiquidity, they should pay the special attention to the information of cash flows, which is not included in the Financial Statements Annual Bulletin.

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DOMAIN AND RESTRICTIONS OF THE STATE AUDIT INSTITUTION OF THE REPUBLIC OF SERBIA

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Abstract: *At the end of each year, companies prepare financial statements in which they display the results of their operations. Companies, as well as budget users, such as: hospitals, schools, local self-governments, public companies, compulsory social security organizations, and others, are obliged to prepare a set of financial statements within prescribed deadlines. Since the statements of both private and public companies are susceptible to various manipulations and frauds, they need to be subject to an independent audit that will examine whether the reports are prepared in accordance with generally accepted principles and standards. The state audit includes all audits by government agencies and organizations. As for the state audit, it includes audit of financial statements, compliance audit and performance audit. As such, they continuously contribute to the stability of financial management system and to the overall responsibility of all users of funds within the overall public spending. If auditors detect fraud or suspect its existence, they should inform the competent management of budget users. It is often emphasized that state auditors have greater competence than auditors in the private sector, since state auditors have a duty to file a criminal complaint against the perpetrator if it is established that a criminal act had occurred. In doing so, the collected audit evidence indicating a criminal act is insufficient to be accepted by the court, which complicates the whole process and becomes time consuming. In the Republic of Serbia, this role has been given to the State Audit Institution. The institution was established in 2005 as an independent authority and is accountable to the National Assembly for the conduct of activities. The main task of the State Audit Institution (SAI) is to examine the transactions reported in state institutions' financial statements and to verify them, i.e. to state an opinion on whether they have been carried out in accordance with legal regulations, authorizations and principles. However, SAI encounters many irregularities in its work, which must be examined completely in order to check if there is an unintentional procedure behind them, which is usually the result of inexperience and ignorance, or the intent that results in deceit. Therefore, the subject of the paper is the analysis of the work of SAI in the Republic of Serbia through the review of state institutions' audit reports for 2014 and 2015. The objective of the analysis is to indicate the significance, restrictions and problems that SAI encounters during the audit, as well as to draw attention to transactions where most irregularities are observed.*

Keywords: *audit, state audit institution, irregularities, financial statements*

JEL Classification: *M42, H83*

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INTRODUCTION

The audit was created within the accounting profession, firstly as an internal audit. For many years, the accounting profession has dominated the audit function. For that reason, they are often used today as synonymous terms “auditing profession” and “public accounting profession” or “certified public accountant” (Ljubisavljević, 2000, p. 13). One of the many definitions of the audit was given by the American Institute of Certified Public Accountants (AICPA), which defines the audit as “the system process of objective acquisition and evaluation of evidence on statements, economic actions, and events in order to determine the level of compatibility between the statements and established criteria, as well as announcement of results to the interested users” (Ricchinte, 1989, p. 215). Given that the audit is said to constitute a subsequent control or the control of control, one of the definitions is: “Audit is a subsequent verification of business events conducted on the basis of existing documentation” (Martić, 1987, p. 2.)

The main objective of the audit of financial statements is to state auditor’s opinion whether the statements are properly prepared in all material respects, i.e. whether they are true and objective. In order for the auditor to state an opinion on the truthfulness of financial statements, it is necessary to verify the truth of all balance sheet items in financial statements and disclosure of other relevant information by the management (Jovković, 2014, p. 49). Executive directors are responsible for guaranteeing the accuracy of financial statements, with their signature. Auditors are the ones who need to collect sufficient evidence to issue an adequate opinion. It is important to point out that auditors cannot issue the opinion that financial statements are absolutely accurate, since in that case they would have to check the entire documentation and all transactions. Therefore, auditors state an opinion based on tested transactions on the basis of selected sample. Opinion can be unmodified (unmodified opinion and unmodified opinion with an emphasis of matter) or modified (qualified opinion, adverse opinion and disclaimer of opinion). (Ljubisavljević and Jovković, 2016, p. 414).

External auditors are not required to disclose fraud in companies. If they detect errors or frauds, they have the right to require the management to correct them before issuing their financial statements. If the observed shortcomings fail to be corrected, auditors are obliged to issue qualified or adverse opinion. Auditors are qualified persons who will provide the client with services with due professional attention and with respect to basic ethical principles. They will be prosecuted in case they consciously issue unmodified opinion, despite the fact they have collected enough evidence to indicate the existence of fraud. The auditor is not responsible for preventing fraud. One of the reasons for such an attitude is the existence of inherent restrictions of the audit, which are reflected in the following:

1. The audit does not guarantee the disclosure of all material misstatements due to factors such as judgment, use of samples in checking, inherent restrictions of internal control, as well as the fact that a large portion of the available evidence is convincing but not definitive in nature;
2. Criminal act often involves sophisticated and carefully organized concealment schemes, and in this regard the risk of not revealing material misstatement due to criminal activity is greater than the risk of not revealing material misstatement due to an error;
3. The risk of not revealing material misstatement due to embezzlement by management is greater than due to the embezzlement by employees;
4. Subsequent disclosure of material misstatements in financial statements due to criminal acts or errors, as itself, does not indicate: a. failure to gain assurance in a reasonable degree; b. inadequate planning, performance or judgment, c. lack of professional competence and necessary attention, or d. failure to comply with ISA (Todorović and Čupić, 2007, p. 53).

In addition to the restrictions regarding working with samples, there is also a problem of well-designed frauds. In order to commit a fraud, knowledge of defects in internal controls and agreement between two or more people is needed. In these cases, auditors may receive forged

documents or may be denied access to individual records. There are a number of factors that can make the work of external auditors difficult. Important factors of the restrictions of external audit are: errors in judgment, restrictions related to the selection and use of samples, poorly organized internal control, restrictions on the materiality and relevance of collected evidence, agreement between individuals in order to achieve their hidden goals and restrictions due to the application of the costs/benefit principle (Stančić et al., 2013, pp. 1888).

As for the state audit, it conducts financial statement audit, compliance audit and performance audit of state institutions. State audits continuously contribute to the stability of financial management system and the overall responsibility of all fund users within the overall public consumption (Šnjegota, 2015, p. 318). State auditors need to comply with the International Standards on Auditing (ISA), as well as the International Standards of Supreme Audit Institutions (ISSAI) in their work. The mission of the state audit is to permanently report, through timely and high quality audit reports prepared on the basis of financial audit, performance audit, compliance audit, legislative and executive authorities and their bodies, authorities and institutions, other competent institutions and the public, on the manner of public funds management, i.e. whether public funds are managed in a regular, cost-effective, efficient and effective manner. (Šnjegota, 2015, page 330).

If auditors disclose fraud or suspect its existence, they should inform the competent management of budget users. It is often emphasized that state auditors have greater competence than auditors in the private sector, since state auditors have a duty to file a criminal complaint against the perpetrator of a criminal act if it is established that it had occurred. In doing so, the collected audit evidence indicating a criminal act is insufficient to be accepted by the court, which complicates the whole process and becomes time consuming.

STATE AUDIT INSTITUTION IN THE REPUBLIC OF SERBIA

State Audit in the Republic of Serbia is performed by the State Audit Institution (SAI) founded in 2005, by virtue of the Law on the State Audit Institution. (Official Gazette of the Republic of Serbia, No. 101/2005, 54/2007, 36/2010). The State Audit Institution is an individual and independent state authority. The Institution is accountable to the National Assembly of the Republic of Serbia for the conduct of activities stemming from its competence. The State Audit Institution performs an audit, prepares reports on the basis of the conducted audit, issues bylaws, and provides advice to users of budget funds, provides recommendations for amending existing laws, adopts auditing standards, and cooperates with international accounting and auditing organizations. Audit entities are all direct and indirect users of budget funds, i.e. compulsory social insurance organizations, budget funds, the National Bank of Serbia, public companies, companies established by direct or indirect user of budget funds or by the one who has a stake in the capital of that company. Audit may include giving grants and guarantees, political parties, beneficiaries of European Union funds and beneficiaries of other donations and assistance from international organizations.

The State Audit Institution performs the following types of audit:

1. **Audit of financial statements** - includes reviewing documents and reports for the purposes of acquiring sufficient evidence for stating opinion as to whether financial statements of the audited entity truthfully and objectively reflect its financial condition, operating results and cash flows, and whether they are in compliance with accepted accounting principles and standards.
2. **Compliance audit** - reviewing financial transactions and decision regarding income and expenses, in order to determine whether transactions in question have been executed in

compliance with the law, other regulations and issued authorizations and for planned purposes.

3. **Performance audit** - reviewing the manner in which budget funds and other public funds are spent, for the purposes of acquiring sufficient, adequate and reliable evidence for reporting whether the assets of the audited entity have been used in compliance with the principles of economy, efficiency and effectiveness, and in compliance with the planned goals (<https://www.dri.rs/o-nama/nadleznosti.341.html>, downloaded on October 2, 2017).

When it comes to compliance audit, the audit reports indicate whether the funds were used in compliance with the law and for planned purposes. The Republic of Serbia loses nearly 400 million euros annually as a consequence of numerous irregularities in public procurement. Namely, the public procurement system is such that the number of bidders is rapidly decreasing, while, on the other hand, the number of those appearing in urgent procedures is doubled. For the above reasons, at the end of 2012, the Public Procurement Law was adopted with the aim to prevent corruption in the state administration more efficiently, as well as to enable a more favorable business environment for foreign investors (Vidaković and Petrović, 2013, p. 2). It is often the case that public procurement complies with all legal regulations, all procedures, that the most favorable supplier is selected, but frauds still happen. Primarily, this is in reference to unrealistically higher price in the offer of selected supplier than the current market prices. The public procurement procedure itself is carried out respecting the Public Procurement Law, (Official Gazette RS No. 124/2012, 14/2015, 68/2015). The law implies respect for the principles of publicity, transparency and equality of bidders. Contracting authority may not impose conditions that would constitute national, territorial, subject-matter or personal discrimination among bidders, or discrimination arising from the classification of the business activity performed by the bidder. (Public Procurement Law, Official Gazette RS No. 124/2012, 14/2015, 68/2015). The procedure itself means respecting deadlines and the manner of submitting bids by bidders. The criteria for the selection of most favorable bid are precisely defined: economically most advantageous bid or the lowest offered price. (Law on Public Procurement, Official Gazette RS No. 124/2012, 14/2015, 68/2015). Economically most advantageous bid includes, in addition to the offered price, other criteria related to the date and method of delivery, offered discounts, payment deadlines, post-sales services and the like. It often happens in practice that even though all the above conditions are met, the selected supplier's prices are higher than the current market prices. This is a common case in the Republic of Serbia and there are almost no audit reports that do not mention the problem of public procurement. Very often, the outcome of public procurements is known in advance. In fact, there are several suppliers offering high prices in offer, and only one with the most favorable price who concludes the contract. Auditors often reveal these frauds and write the emphasis of matter in their reports. Many sources of information on current market prices are available today, as a result, auditors can detect frauds more easily in public procurement.

In 2014, SAI issued 135 audit reports, out of which 128 opinions were stated on financial statements and the same number on regularity of operations. When it comes to the Sector for Audit of Public Companies and Sector for Audit of the National Bank of Serbia, auditors issued disclaimer of opinion on the truthfulness and objectivity of financial statements, as well as on regularity of operations, while 3 adverse opinions on the regularity of operations were issued to the Sector for Audit of Local Authorities. The overview of the reports is provided in Tables 1 and 2.

Table 1 - Issued opinions on financial statements in 2014

Type of opinion	Number	Sector
Unmodified opinion	9	Sector for Audit of Budget and Budget Funds
	2	Sector for Audit of Local Authorities' Budgets
	4	Sector for Audit of Compulsory Social Insurance Organization
	2	Sector for Audit of Public Companies
	2	Sector for Audit of the National Bank of Serbia
Qualified opinion	10	Sector for Audit of Budget and Budget Funds
	70	Sector for Audit of Local Authorities' Budgets
	9	Sector for Audit of Compulsory Social Insurance Organization
	17	Sector for Audit of Public Companies
	1	Sector for Audit of the National Bank of Serbia
Disclaimer of opinion	1	Sector for Audit of Public Companies
	1	Sector for Audit of the National Bank of Serbia

Source: <https://www.dri.rs/php/document/download/427/2>, Work Report State Audit Institutions for 2014, downloaded on October 27, 2017.

Table 2 - Issued opinions on the regularity of business operations in 2014

Type of opinion	Number	Sector
Unmodified opinion	2	Sector for Audit of Budget and Budget Funds
	1	Sector for Audit of the National Bank of Serbia
Qualified opinion	17	Sector for Audit of Budget and Budget Funds
	69	Sector for Audit of Local Authorities' Budgets
	13	Sector for Audit of Compulsory Social Insurance Organization
	19	Sector for Audit of Public Companies
	2	Sector for Audit of the National Bank of Serbia
Adverse opinion	3	Sector for Audit of Local Authorities' Budgets
Disclaimer of opinion	1	Sector for Audit of Public Companies
	1	Sector for Audit of the National Bank of Serbia

Source: <https://www.dri.rs/php/document/download/427/2>, Work Report State Audit Institutions for 2014, downloaded on October 27, 2017

Budget fund users have an obligation to establish an adequate internal control system that will act preventively in stopping irregularities in operations. Auditing 135 users of budget funds, auditors found that most of the entities did not establish an adequate internal control system. Regardless of the increased use of contemporary data-processing systems, many transactions are still being recorded manually, which increases the risk of discrepancy between the postings in the books of account of budget fund users and the general ledger of the Treasury of the National Bank of Serbia. Out of 72 audited entities, only 3 entities had the internal audit that worked efficiently. Even 71.43% of entities did not have an internal audit. Furthermore, one of the existing problems is related to the inadequacy of the inventory of assets and liabilities. Namely, in case of numerous users, the inventory is done only formally without the existence of a column in the inventory lists relating to the book value and actual value, their difference, and the reasons for deviation. Also, analytical records do not comply with synthetic records and there are no decisions on the manner of liquidation of established surpluses, as well as the procedures for dealing with deficiencies.

In 2015, SAI issued 156 opinions on financial statements and 158 opinions on the regularity of operations, as shown in Tables 3 and 4.

Table 3 – Issued opinions on financial statements in 2015

Type of opinion	Number	Sector
Unmodified opinion	5	Sector for Audit of Budget and Budget Funds
	3	Sector for Audit of Local Authorities' Budgets
	9	Sector for Audit of Compulsory Social Insurance Organization
	4	Sector for Audit of Public Companies
	1	Sector for Audit of the National Bank of Serbia
	1	Political parties
Qualified opinion	12	Sector for Audit of Budget and Budget Funds
	91	Sector for Audit of Local Authorities' Budgets
	3	Sector for Audit of Compulsory Social Insurance Organization
	20	Sector for Audit of Public Companies
	2	Other users of public funds
	2	Political parties
Disclaimer of opinion	1	Sector for Audit of Public Companies
Adverse opinion	1	Users of funds of compulsory social insurance organizations
	1	Public companies

Source: <https://www.dri.rs/php/document/download/724/1>, Work Report State Audit Institutions for 2015, downloaded on October 27, 2017

Table 4 - Issued opinions on the regularity of operations in 2015

Type of opinion	Number	Sector
Unqualified opinion	7	Sector for Audit of Budget and Budget Funds
	1	Sector for Audit of the National Bank of Serbia
	1	Political parties
Qualified opinion	12	Sector for Audit of Budget and Budget Funds
	94	Sector for Audit of Local Authorities' Budgets
	12	Sector for Audit of Compulsory Social Insurance Organization
	25	Sector for Audit of Public Companies
	2	Other users of public funds
	2	Political parties
Adverse opinion	1	Sector for Audit of Compulsory Social Insurance Organization
Disclaimer of opinion	1	Sector for Audit of Public Companies

Source: <https://www.dri.rs/php/document/download/724/1>, Work Report State Audit Institutions for 2015, downloaded on October 27, 2017

As in the previous year, in 2015 there were also problems with the establishment of an effective internal control system. With most budget users, the internal control system did not provide the

preparation of real financial statements. Regarding the establishment and functioning of internal audit, there was a slight improvement compared to 2014. About 65% of budget users did not establish an internal audit, although they were obliged to do so, while the percentage was 71.43% in 2014. During 2015, SAI filed a total of 230 charges for the existence of a reasonable suspicion that a misdemeanor/criminal act was committed. Out of the total number of filed charges, 207 refer to requests for initiating a misdemeanor procedure, 9 pertaining to economic offense and 14 to criminal charges. Figure 1 shows a comparison of the audit reports in 2014 and 2015.

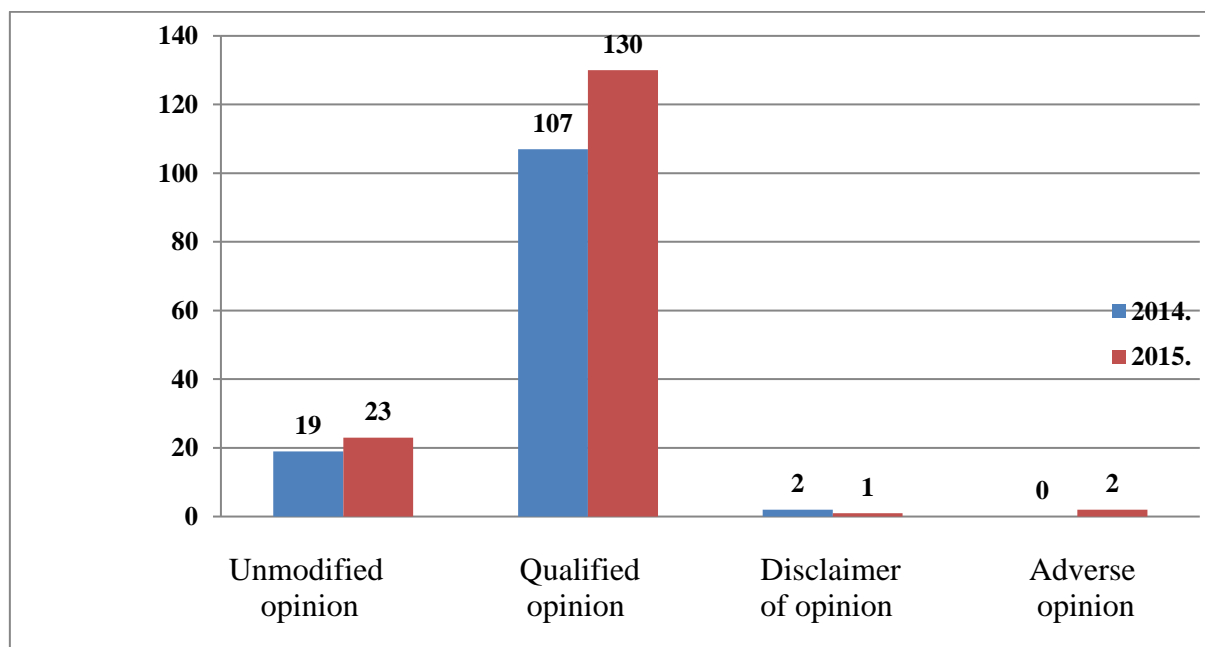


Figure 1 – Issued opinions on financial statements in 2014 and 2015

Source: Authors' design

RESULTS OF THE ANALYSIS OF THE STATE AUDIT INSTITUTION'S REPORT

SAI's reports, created during the audit of the Sector of Local Authorities' Budgets, Compulsory Social Insurance Organization and public companies, were analyzed below, in order to identify the most common problems that SAI faces in its work.

By analyzing the data from SAI website, it can be seen that the auditors most often stated qualified opinion on financial statements and regularity of **local authorities' operations**. Some of the remarks most commonly reported in SAI's report will be considered on the example of the municipality of Aleksinac report on local authorities' work. In the work of the state audit, it was established that numerous positions related to non-financial assets, such as fixed assets, inventories, long-term financial assets and short-term receivables, were not recorded in the balance sheet (<https://www.dri.rs/php/document/download/38/2>, Report on the Audit of Consolidated Financial Statements of the Budget Trial Balance and Regularity of Operations of the Municipality of Aleksinac for 2013, page 3, downloaded on October 27, 2017). Numerous fixed assets were not recorded in books of account of the entity in whose ownership they were. Some of the budget fund users have posted fixed assets without proof of ownership. The municipal administration had 214 apartments in its ownership out of which 3 apartments were not recorded in subsidiary ledger, hence there was a deviation in the books. Also, 16 apartments were sold, and they were not removed from the records (<https://www.dri.rs/php/document/download/38/2>, Report on the Audit of Consolidated Financial Statements of the Budget Trial Balance and Regularity of Operations of the Municipality of Aleksinac for 2013, page 157, downloaded on October 27, 2017). Due to all observed irregularities, the state audit

recommended acting according to the law, complete recording of assets, and providing evidence of ownership right and regular calculation of depreciation.

The receivables of this budget user were in most cases understated, at the Municipal Administration in the amount of 36,771,000 dinars, and at Public Agency for Urban Planning and Construction, in the amount of 286,000 dinars. Therefore, there was a difference in stated receivables of 745,000 dinars due to the existence of an error in the initial state from 2011, which was downloaded on January 1, 2012. (<https://www.dri.rs/php/document/download/38/2>, Report on the Audit of Consolidated Financial Statements of the Budget Trial Balance and Regularity of Operations of the Municipality of Aleksinac for 2013, page 167, downloaded on October 27, 2017). The auditors emphasized that during the audit process they were not able to confirm this claim by the competent persons of this budget user. One of the key problems and reasons for stating adverse opinion on the regularity of operations are the liabilities that the municipality created fictitiously. Adverse opinions were stated to the Heritage Museum, the Public Library and the Center for Culture and Art. At the Heritage Museum, there was an illegal transfer of funds from the museum's current account to the personal account of the employed bookkeeper. This money was paid in parts to the private account of the employee in the total amount of 179,000 dinars. The Heritage Museum transferred funds to the Center for Culture and Art in the amount of 3,000 dinars, without any evidence to support the existence of this liability. On the other hand, the Center for Culture and Art transferred to the Museum the amount of 33,000 dinars, also without the existence of adequate documentation that would support the existence of this liability. The remainder of the liabilities were posted without the existence of adequate documentation, and the liabilities were taken over through the approved appropriation. The public library also transferred funds illegally to the personal account of bookkeepers in the amount of at least 595,000 dinars. The rest was spent outside the planned purpose in the amount of 20,000 dinars. There has been an unauthorized transfer of funds to the Center for Culture and Art without the existence of valid documentation (<https://www.dri.rs/php/document/download/38/2>, Report on the Audit of Consolidated Financial Statements of the Budget Trial Balance and Regularity of Operations of the Municipality of Aleksinac for 2013, pages 12 and 13, downloaded on October 27, 2017). The largest amount of disputable postings refers to the operations of the Center for Culture and Art in the amount of 5,007,000 dinars. As with the previous two institutions, there has also been an illegal appropriation of the funds by the chief of accounting of at least 992,000 dinars, while the rest relates to spending of funds for purposes that are neither approved nor in accordance with legal regulations (<https://www.dri.rs/php/document/download/40/2>, Report on the Audit of the Presentation of Expenditures, Expenses and Liabilities and regularity of operations of the Center for Culture and Art Aleksinac for 2013, page 7, downloaded on October 27, 2017). All these institutions were issued auditor's adverse opinion on the regularity of operations. It should be kept in mind that auditors base their opinion on samples, and if they were to conduct more detailed research on these malversations, the amounts would probably be much higher. The key problem that led to these oversights is the failure to establish an efficient and effective internal control system that would prevent malversations. Due to numerous oversights in the demarcation of duties, there has been a rather large amount of illegal appropriation of funds. In addition, employees did not record assets, receivables and liabilities adequately, i.e. they did not comply with the principle of completeness. There have been numerous violations of the the Budget System Law, primarily regarding inadequate posting of numerous transactions.

Sector for Audit of **Compulsory Social Insurance Organization** includes the National Employment Service, National Health Insurance Fund and National Pension and Disability Insurance Fund. The subject of the analysis are the reports related to 2014. Auditors issued adverse opinion to the Special Rehabilitation Hospital "Termal" on both the financial statements

and the regularity of operations, which is especially interesting because this was not the case in previous audits. There were major deviations and non-compliance with the law during the preparation of financial statements. First of all, there was a misstatement of the financial result due to understatement of deficit by more than 28.5 million dinars. What has led to this is stating of expenditures and, thus, the liabilities which were allegedly to be paid in the amount reduced by the amount of value added tax. Revenues were unlawfully overstated and posted to wrong accounts in the amount of at least 898,000 dinars. In addition, there were numerous changes that were recorded without the existence of adequate accounting documentation that would corroborate the value in books of account. Avoiding the return of funds to the Autonomous Province of Vojvodina was also unlawful. Namely, this hospital receives funds from the Autonomous Province, but has the obligation to return unspent funds. This obligation has not been fulfilled in this case, but this surplus of funds in the next year, ie 2014, was recorded as revenue from other sources, which resulted in overstating the revenues in the amount of over 24 million dinars (<https://www.dri.rs/php/document/download/592/2>, Report on the Audit of the Trial Balance of the Special Hospital for Rehabilitation "Termal", Vrdnik, for 2014 and regularity of operations, pages 9 and 10, downloaded on October 27, 2017). In addition, there was no comparison between the book value and actual value of receivables, and consequently there was no adequate posting. The opposite was the case with the supplier. As a rule, this account has a credit balance, but in this case, due to the understatement of liabilities and given advance payments, the situation is the opposite. Discrepancy between key positions is shown in Table 5.

Table 5 - Comparison of book value and actual value

Position	Actual value	Book value	Difference
Customers	51,932	50,045	1,887
Suppliers	167,376	64,802	102,574
Transfers between budget users at the same level	187,751	134,143	53,608
Current expenditures	216,347	219,444	-3,097

Source: Authors' design

Problems existed in the employment of workers who did not have required professional qualifications, and yet they were employed, which is not in accordance with the regulations. Wages were also miscalculated and paid out. Each doctor was entitled to an increase in earnings due to on-call and overtime work, where accountants calculated the maximum number of overtime hours (<https://www.dri.rs/php/document/download/592/2>, Audit Report on Trial Balance of the Special Hospital for Rehabilitation "Termal", Vrdnik, for 2014 and Regularity of Operations, pages 71-76, downloaded on October 27, 2017). As with all users of budget funds, effective internal control, that will act preventively in stopping, not very small, number of malversations, has not been established.

Public companies perform activities of general interest and can be established by the Republic of Serbia, an autonomous province or a local self-government unit. They are established and operate in accordance with the Company Law. In 2015, 26 public companies were audited, where the auditors most often issued qualified opinion on financial statements and on the regularity of operations, and one adverse opinion on financial statements. By random selection, the subject of the analysis will be the operations of two public companies: Public Utility Company "Paraćin" from Paraćin and Public Utility Company "Čistoća" from Novi Sad. Both companies were issued

qualified opinions on financial statements and regularity of operations for reports relating to 2014.

The key irregularities observed in the Public Utility Company “Paraćin” from Paraćin, according to SAI’s report, are the following:

1. The company did not review the useful life of building constructions and equipment in accordance with the Section 17. IFRS for SMEs – Property, plant and equipment neither in 2014 nor in the previous period, and, therefore, it did not change the accounting estimate in situations where expectations based on new estimates regarding the use of assets significantly differed from the previous ones, nor did it adjust the amortization rates with new circumstances. This resulted in stating significant number of assets in analytical records that were still in use, in purchase value of 65,406 thousand dinars, which did not have current value stated. The auditors specified that it was not possible to determine the impact of this irregularity in the financial statement of the Company for 2014;
2. The company recorded the purchase of marketplace stands from 2011 and 2012, through costs rather than through the fixed assets position, thus, it did not act in accordance with the Section 17. IFRS for SMEs – Property, plant and equipment and presented lower value of fixed assets for 7,630 thousand dinars and non-adjusted earnings in the previous years in the same amount;
3. During the audit process, the auditors could not be convinced of management's estimate objectivity to correct the receivables older than 180 days from the maturity date, in the amount of 56,176 thousand dinars, at the expense of period cost, in the amount of 11,233 thousand dinars, that is, the estimate of recoverability was calculated in accordance with Section 11. IFRS for SMEs - Financial Instruments: Recognition and Measurement. The effect of the specified issue on financial statement for 2014 could not be determined;
4. The company did not calculate deferred tax assets and did not record calculation effects in its books of account in accordance with Section 29. IFRS for SMEs – Income Tax, and in this way presented lower net profit for 2014 and deferred tax assets in the amount of 1,722 thousand dinars. (<https://www.dri.rs/php/document/download/570/2>, Report on the Audit of Financial Statements and Regularity of Operations of the Public Utility Company “Paraćin”, Paraćin, for 2014, page 3, downloaded on October 27, 2017).

The key irregularities observed at Public Utility Company “Čistoća” from Novi Sad, according to SAI’s report, are as follows:

1. The company overstated fixed assets and suppliers for fixed assets in the balance sheet.
2. Company’s share for the purchase of employee’s apartment is recorded within fixed assets rather than as a long-term financial placement.
3. The company spent only 0.82% of the total approved funds for the renovation of the landfill.
4. The company leads a large number of legal disputes, whereby the company is the respondent and, therefore, has large reservations for the costs of disputes.
5. Net profit is stated in the income statement, while the balance sheet shows loss above capital value. The company also had higher liabilities than current assets, which jeopardized the survival of the company.
6. Public procurement was carried out without respect for the law.
7. The company collected receivables and paid liabilities through a special purpose account, which is not in accordance with the Law on Payment Transactions. (<https://www.dri.rs/php/document/download/554/2>, Report on the Audit of Financial

Statements and Regularity of Operations of the Public Utility Company “Čistoća”, Novi Sad, for 2014, pages 4 and 5, downloaded on October 27, 2017).

These two companies perform the same activity, whereby audit findings are partially different in terms of observed irregularities. What is similar, not only for these two companies but also for the users of budget funds, is the lack of an effective internal control system that would prevent malversations? Moreover, internal audit, whose establishment is mandatory, exists in Paraćin, but no person is still performing this function, while in Novi Sad the function is in the process of establishment.

Public procurement is generally a problem for all users of budget funds. In 2014, a person who did not have the professional exam certificate was employed in public procurement. In the Public Utility Company “Čistoća” from Novi Sad, the Sector for Economic Affairs was separated from the Legal Affairs Sector, and public procurement activities were carried out in the Commercial Affairs Department within the Sector for Economic Affairs. There was a change in the structure of procurement in the Public Utility Company “Čistoća” from Novi Sad, and the same was reduced to 503,290,000 dinars (<https://www.dri.rs/php/document/download/554/2>, Report on the Audit of Financial Statements and Regularity of Operations of the Public Utility Company “Čistoća”, Novi Sad, for 2014, page 18, downloaded on October 27, 2017). The key problems that have arisen with the Public Utility Company “Paraćin” refer to purchases without making a public call for bids, as well as fuel purchases from “Miletić Komerc” Ltd. regardless of the fact that the Commission had overthrown this agreement (<https://www.dri.rs/php/document/download/570/2>, Report on the Audit of Financial Statements and Regularity of Operations of the Public Utility Company “Paraćin”, Paraćin, for 2014, page 18, downloaded on October 27, 2017).

Public Utility Company “Čistoća” from Novi Sad committed discrimination against potential suppliers in terms of requesting additional conditions that numerous suppliers could not meet. For example, in the public procurement of insect and bacterial destruction services, the requirement of the company was that the bidder had at least one epidemiologist employed at the time of announcement of call for bids. In this way, the bidders were not given the opportunity to fulfill the requested condition by the time they submitted their bids. For the public procurement of legal services, the Company required that bidder had five graduated lawyers employed, of which at least two must have passed the bar exam at the moment of the announcement of call for bids (<https://www.dri.rs/php/document/download/554/2>, Report on the Audit of Financial Statements and Regularity of Operations of Public Utility Company “Čistoća”, Novi Sad, for 2014, page 20, downloaded on October 27, 2017).

CONCLUSION

How budget users use the money of taxpayers is of great importance for each country. SAI is one of the main forms of control of state institutions in the Republic of Serbia, so the analysis of the most frequent problems that this institution faces in its work has indicated what should be improved and corrected in the work of state institutions in the future. Greater transparency is provided by auditing operations of state institutions, pointing to key problems and irregularities, and publishing all the information. Consequently, there is more confidence in budget fund users' financial reports. The basic requirement and characteristics of SAI is its independence, that is, the requirement and the assumption that its work cannot be influenced. Given that SAI is accountable to the National Assembly of the Republic of Serbia for the conduct of activities, the question of its absolute independence is raised. Therefore, further development and functioning of SAI should go towards greater independence, which would also provide a higher level of confidence in stated auditor's opinions.

Based on the analysis of audit reports, it is noted that the key problems of most budget users are overstatements or understatements of numerous positions in financial statements. Most often, understatement of fixed assets occurs due to the avoidance of posting certain business changes, as well as due to posting in wrong accounts. On the other hand, in order to show a better financial result, many users of budget funds resorted to overstating revenues and understating expenditures. Nevertheless, frauds also existed in cash flows, as in order to reconcile inflows and outflows, users resorted to overstatement and understatement of the same. Regardless of the existence of an obligation to list all assets and liabilities at the end of the year, most budget users did not do so, or did not do it completely. Also, there is often no comparison between the book value and actual value, there are generally no adequate lists of inventory and determination of the actual value of receivables and liabilities is avoided.

Public procurement is a special problem, since most budget users do not comply with the Public Procurement Act, and most often procurements take place without public announcement of call for bids. Some of the users chose the lowest offered price, which is one of the criteria for choosing a supplier. However, there was no confirmation that these prices were not higher than the current market prices. Also, in many public procurements, the suppliers who were chosen had personal acquaintances or family relationships with managers of the budget fund. However, the most common complaint by SAI auditors was related to the establishment and functioning of the internal control system. The fact is that many budget users had certain procedures, but mainly resulted in inadequate demarcation of duties, which most commonly led to the unlawful appropriation of funds. If one person is responsible for posting a transaction from beginning to end, it is logical that this will easily lead to misuses. Budget users must establish internal control, either as a separate department, or as part of the existing booking department. The largest number of users who were subject of the analysis either did not have an established internal audit or it did not function in an adequate manner. In order for a person to be employed in the internal audit department, they must pass the internal auditor exam. Mainly, this condition was met, however, the person in charge of internal audit activities performed other tasks.

All these oversights indicate many problems in the work of state institutions and budget users. Legal solutions exist, certain have to be subject to correction and improvement, but the greater problem is in inadequate application and lack of concrete control. Since it is a direct damage to the state budget, it is necessary to strengthen the control systems, both internal and external, to employ and educate additional staff to work at SAI so that a larger number of budget users could be subject to control every year. Finally, it is necessary that the state, both politically and financially, supports and encourages the work of SAI and all corrective measures taken by this institution.

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FINANCIAL REPORTING OF INVESTMENT PROPERTIES IN SERBIAN MANUFACTURING ENTERPRISES

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Abstract: *Investment properties are a specific category of non-current assets. According to the International Accounting Standard (IAS) 40 – Investment property, this category of assets is defined as property (land or a building, or part of a building or both) held to earn rentals or for capital appreciation or both, rather than for (a) use in the production or supply of goods or services or for administrative purposes or (b) sale in the ordinary course of business. Investment properties may be held by the owner or by the lessee as a right-of-use an asset. The principles of initial and subsequent measurement of investment properties are similar as in the case of other items of properties (and also plant and equipment). The mentioned assets are initially measured at cost. After the initial recognition, financial statement preparers choose between the historical cost model and the model based on fair value. However, the accounting treatment of fair value changes, if financial statement preparers decide to measure these assets using the model based on fair value, is different. Changes in fair values of other properties are included in the equity and presented under other comprehensive income. Changes in fair value of investment properties are included in the profit or loss. Those changes represent unrealised gains or losses and should be carefully treated by financial statements users. If the fair value model is chosen for subsequent measurement, investment properties shall not be depreciated. In this paper, we discuss financial reporting on investment properties on the basis of the random sample of Serbian manufacturing companies. The aim of the paper is to determine whether financial statements preparers prefer the historical cost model or the model based on fair value for the subsequent measurement of investment properties. Practices of the subsequent measurement of investment properties are analysed from the aspects of firm size, legal form and the basis used for financial reporting (full IFRS or IFRS for Small and Medium-Sized Entities – IFRS for SMEs). We also discuss the percentage share of investment properties in the total assets and in the non-current assets in order to evaluate their materiality. We find that companies are more likely to choose the fair value model for the subsequent measurement of investment properties than the historical cost model. We also find that a significant number of companies that recognize investment properties do not disclose the measurement model for this type of tangible assets, although such a disclosure is required by the standards (IAS 40 and IFRS for SMEs).*

Keywords: *Investment properties; Measurement; Fair value; Historical cost; IFRS*

JEL Classification: *M 41, M 48*

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INTRODUCTION

Financial reporting is the branch of accounting that deals with the preparation of financial statements (Melville, 2017, 3). Companies prepare financial statements in order to present the influence of internal and external transactions and other events on financial position, financial performance and cash flows. Information presented in the financial statements is significant segment of the total information about the specific company (Obradović, 2016, 1). Financial statements exist to provide useful information on businesses to people who have, or may have, an economic stake in those businesses. These statements should help investors, bankers, suppliers, customers, tax authorities, trade union representatives, competitors, courts of law, antitrust regulators and employees (Young & Cohen, 2013, 1). Primary users of financial statements are capital providers, i.e. present and potential equity investors, lenders and other creditors. Other mentioned users are not primary, but information that is decision-useful to capital providers may also be useful to other users of financial statements who are not capital providers (Walton, 2011, 38).

A significant part of the information about financial position is information about non-current (fixed, long-term) assets (intangible and tangible). Non-current assets are a very important kind of assets for many companies, because of their significant share in the total assets. Furthermore, users of financial statements are interested in the nature and condition of a company's non-current assets because such assets represent the company's capacity to produce and sell goods and/or services in the future (Pratt, 2011, 385). Non-current assets (a) are used in the manufacturing, merchandising or service to generate revenues and cash flows for more than one period, (b) have expected useful lives extending over more than one period and (c) are intended for use in operating activities and are not acquired for sale in the ordinary course of business (Wild *et al.* 2007, 213-214). Main categories of intangible non-current assets are goodwill, patents, copyrights, trademarks, licenses, customer lists and other rights. Main categories of tangible non-current assets are property, plant, equipment, investment properties and biological assets. All these mentioned non-current assets are subjects of numerous International Financial Reporting Standards (IFRS) and majority of them are strongly influenced by accounting policies choices. Some of the accounting policies will be dictated by a financial reporting standard which permits no choice of treatment (for example, International Accounting Standard (IAS) 38 – Intangible Assets, prevents entities from recognising internally-generated goodwill in their financial statements), but some standards do permit a choice (for example, IAS 16 – Property, plant and equipment, allows items of property, plant and equipment to be measured using either the cost model of the revaluation model) (Melville, 2017, 62). Differences in accounting choices can yield differences in financial statement numbers. One way that financial statement users cope with this challenge is by carefully scrutinizing the notes to financial statements (Young & Cohen, 2013, 14).

Investment properties are a specific category of non-current assets. Accounting treatment of the investment properties is the subject of IAS 40 – Investment property. In this paper, we discuss financial reporting on investment properties on the basis of the random sample of 233 Serbian manufacturing companies. The aim of the paper is to determine whether the financial statements preparers in the subsequent measurement of investment properties prefer the historical cost model or the fair value model. Practices of the subsequent measurement of the investment properties were analysed from the aspects of firm size, legal form and the basis used for financial reporting (full IFRS or IFRS for Small and Medium-Sized Entities – IFRS for SMEs). The research hypothesis is formulated as follows:

H1: Serbian manufacturing companies are more likely to choose the fair value model for the subsequent measurement of investment properties than the historical cost model.

LITERATURE REVIEW

According to IAS 16, property, plant and equipment are acquired for use in a company's operations and are used over the period of its useful life. However, property which is acquired as an investment rather than for use is not consumed in the company's operations and does not have a useful life. This means that IAS 16 is generally inappropriate for accounting treatment of such property. A more suitable financial reporting standard for such property is IAS 40 (Melville, 2017, 92). Investment property is defined as property (land or a building, or part of a building or both) held to earn rentals or for capital appreciation or both, rather than for (a) use in the production or supply of goods or services or for administrative purposes or (b) sale in the ordinary course of business. Investment properties may be held by the owner or by the lessee as a right-of-use asset (IAS 40, paragraph 5). Examples of investment properties, given in the IAS 40, are: land held for a long-term capital appreciation, land held for a currently undetermined future use, a building owned by the company and leased out under one or more operating leases, a building that is vacant but is held to be leased out under one or more operating leases and property that is being constructed or developed for future use as investment property. Investment properties do not include (a) property that is owner-occupied and used or leased for use in the business and (b) property held as inventory (e.g. in case of homebuilder) (Needles & Powers, 2013, 52). If a property is held partly as an investment property and partly for own use, the two parts are treated differently. Main condition for this accounting treatment is that parts could be sold separately. If parts of the property cannot be sold separately, the property is accounted for under IAS 16, except where the own use part is insignificant (Walton, 2011, 89).

At initial recognition, investment property is measured at its cost. The cost of a purchased investment property consists of its purchase price and any directly attributable expenditure, such as professional fees for legal services, property transfer taxes and other transactions costs, because transaction costs shall be included in the cost (IAS 40, paragraphs 20 and 21). If investment property is acquired in exchange for a non-monetary asset or assets or a combination of monetary and non-monetary assets, such property is initially measured at fair value unless the exchange transaction lacks commercial substance or the fair value of neither the asset received nor the asset given up is reliably measurable. If the acquired investment property is not measured at fair value, its cost is measured at the carrying amount of the asset given up (IAS 40, paragraph 27).

After the initial recognition, investment property can be measured at (a) the fair value model or (b) the cost model. The fair value model means that investment property is measured at its fair value at the end of each reporting period. According to the IFRS 13 – Fair value measurement (paragraph 9), fair value is defined as "the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date". If the fair value model is chosen for subsequent measurement, investment properties shall not be depreciated. This model allows companies to reflect unrealised gains and losses on the market value of their investments in the income statement for the period in which it arises (Walton, 2011, 89; Melville, 2017, 93). The cost model means that investment property is measured at cost, less any depreciation and less any accumulated impairment losses. More specifically, company that chooses the cost model shall measure investment property (a) in accordance with IFRS 5 – Non-current Assets Held for Sale and Discontinued Operations, if it meets the criteria to be classified as held for sale or is included in a disposal group that is classified as held for sale, (b) in accordance with IFRS 16 – Leasing, if it is held by a lessee as a right-of-use asset that is not held for sale in accordance with IFRS 5 and (c) in accordance with requirements in IAS 16 for the cost model in all other cases (IAS 40, paragraph 56). If the cost model is used, the company must disclose, inter alia, the fair value of its investment property, when company can measure it reliably. This means that the fair value of investment property has

to be determined whether or not the company has actually adopted the fair value model (Melville, 2017, 93). It is obvious that the principles of initial and subsequent measurement of investment properties are similar as in the case of other items of properties (and also plant and equipment). These assets are initially measured at cost. After the initial recognition, financial statement preparers choose between the historical cost model and the model based on fair value. However, the accounting treatment of the fair value changes, if financial statement preparers decide to measure these assets using the model based on fair value, is different. Changes in fair values of other properties (and also plant and equipment) are included in the equity and presented under other comprehensive income. Changes in the fair value of investment properties are included in the profit or loss.

Cairns *et al.* (2011) have investigated the use of fair value measurements by 228 listed companies in the United Kingdom and Australia around the time of adoption of IFRS from 1 January 2005. The results of their research reveal a conservative approach and/or lack of incentives to use fair value. Exceptions include some financial institutions and companies holding investment properties. About 74% of the companies which had investment properties used the fair value model for their subsequent measurement and about 26% of them used the cost model. Christensen & Nikolaev (2013) examined valuation practices of property, plant and equipment, investment property and intangibles on the sample of 1.539 companies from United Kingdom and Germany that complied with IFRS in either 2005 or 2006. With very few exceptions, they have found that fair value was used exclusively for property (3% of the companies use fair value for owner-occupied property, compared with 47% for investment property). This can be explained by lower costs to reliability measure fair values in the presence of relatively liquid property markets. Mäki *et al.* (2016) investigated the association between the use of fair value for measurement of investment properties and ownership dispersion. Their results show that companies with dispersed ownership are more likely to use the fair value model. Furthermore, about 80% of the observed companies from different European Union countries use the fair value model for subsequent measurement of investment properties. The data is for years 2009 to 2013. Muller *et al.* (2008) have found that approximately the same percentage of companies used the fair value model for subsequent measurement of investment properties. Their sample consisted of 77 continental-European investment property firms. Research of Prewysz-Kwinto & Voss (2016) has encompassed the largest 30 capital groups which were included in WIG 30 (capitalization-weighted stock market index of 30 largest companies on the Warsaw Stock Exchange) on August 1, 2015. The observed companies prepared financial statements by using IFRS and the research included both consolidated and separate financial statements prepared for 2014. More than one third of the observed companies (36.80%) used the fair value model for subsequent measurement of investment properties whereas almost two thirds of the companies (63.20%) measured investment properties at the end of the reporting period by using the cost model. Taplin *et al.* (2014) examined the use of the fair value model for investment properties in 96 randomly selected Chinese listed companies' year-ending 2008 annual reports. They found that one half of the sampled companies used the fair value model while the other half used the cost model. Their additional analyses showed that (a) companies with an international influence, i.e. companies listed on international stock exchanges and/or companies with international business operations and (b) companies with above average volatility in earnings were more likely to use fair value.

RESEARCH SAMPLE AND METHODOLOGY

In order to test our hypothesis, we used a sample of 233 randomly selected Serbian manufacturing companies of different size, legal form and basis used for financial reporting (full IFRS or IFRS for SMEs). The analysis is based on the financial statements for 2014, 2015 and 2016 published on the official website of the Serbian Business Registers Agency. The structure

of the sample by size and legal form is shown in Table 1, whereas the structure of the sample by the basis used for financial reporting is shown in Table 2. Many companies in the Republic of Serbia apply IFRS when preparing and presenting their general-purpose financial statements. Some companies are required or allowed to apply full IFRS, some companies are required or allowed to apply IFRS for SMEs, while some companies (micro entities) have the option to use the Ordinance of the Minister of Finance instead of IFRS (Obradović & Karapavlović, 2016, 224). All sampled companies have used IFRS (full or IFRS for SMEs). Section 16 of the IFRS for SMEs deals with investment properties. Generally, this section corresponds to IAS 40, but there is one difference in subsequent measurement. According to the IFRS for SMEs (Section 16), the fair value model is normally used. However, if the fair value cannot be measured reliably then the cost model may be used (Melville, 2017, 425).

Descriptive statistics, repeated measures ANOVA and Friedman's test are used for data processing. We have used the significance levels of 0.05 and 0.01.

Table 1. Sample structure by size and legal form

	Number	%
<i>SIZE*</i>		
micro	8	3.43
small	67	28.76
medium-sized	101	43.35
large	57	24.46
<i>total</i>	<i>233</i>	<i>100.00</i>
<i>LEGAL FORM</i>		
limited liability company	148	63.52
stock company	85	36.48
<i>total</i>	<i>233</i>	<i>100.00</i>

*Classification is based on the 2013 Accounting Law.

Source: Author's calculation

Table 2. Sample structure by the basis used for financial reporting

Basis for financial reporting	2014.		2015.		2016.	
	No.	%	No.	%	No.	%
full IFRS	193	82.83	190	81.55	188	80.69
IFRS for SMEs	31	13.30	34	15.59	38	16.31
do not clearly disclose	7	3.00	8	3.43	6	2.58
do not disclose	2	0.86	1	0.43	1	0.43
<i>total</i>	<i>233</i>	<i>100.00</i>	<i>233</i>	<i>100.00</i>	<i>233</i>	<i>100.00</i>

Source: Author's calculation

Repeated measures ANOVA (*Wilks' Lambda* = 0.999; $p = 0.940 > \alpha = 0.05$; *Partial Eta Squared* = 0,001) and Friedman's test (*Chi-Square* = 0.609; $df = 2$; $p = 0.738 > \alpha = 0.05$) show that the basis used for financial reporting of the sample companies did not statistically change during the period of the analysis. It is a favourable fact from the aspect of comparability. The sample is also analysed according to the auditor's opinions on financial statements (classified according to Ljubisavljević & Jovković, 2016, 414-421) (see Table 3). Companies' statements with (a) modified adverse opinion and (b) disclaimer of opinion are excluded from the analysis.

Table 3. Auditor's opinions on the sample companies financial statements

Auditor's opinion	2014.		2015.		2016.	
	No.	%	No.	%	No.	%
unmodified (positive)	93	39.91	100	42.92	97	41.63
unmodified (with emphasis of matter)	56	24.03	50	21.46	58	24.89
modified (qualified)	48	20.60	42	18.03	38	16.31
modified (adverse)	1	0.43	-	-	-	-
modified (disclaimer of opinion)	6	2.58	9	3.86	8	3.43
auditing is not mandatory	26	11.16	31	13.30	32	13.73
auditor's statement is missing	3	1.29	1	0.43	-	-
<i>total</i>	<i>233</i>	<i>100.00</i>	<i>233</i>	<i>100.00</i>	<i>233</i>	<i>100.00</i>

Source: Author's calculation

RESULTS AND DISCUSSION

Generally, investment properties are not important items of the statements of financial position (balance sheets) of the manufacturing companies in the Republic of Serbia. The average shares of investment properties in the total assets in the years 2014 to 2016 are 1.98%, 1.81% and 1.76%, respectively. The analysis of the companies which have investment properties in all three observed years shows that the average shares of those properties in the total assets are 6.29%, 5.11% and 5.11%, respectively. According to the company size, the biggest share of investment properties in the total assets is at micro companies (averagely 21.31%) and the smallest share is at large and medium companies (averagely 4.26% and 4.24%). The average share of investment properties in the total assets at limited liability companies and stock companies is similar (about 5.50%).

Practices of subsequent measurement of investment properties are presented in Table 4. Most of the sample companies do not have investment properties. Some companies do not have investment properties but disclose measurement model. It means that they have chosen the accounting policy which will be activated when and if they acquire investment properties. The analysis shows that companies prefer the fair value model for subsequent measurement of investment properties. Considering the companies which have investment properties in all three observed periods, we also conclude that the fair value model is dominant (Table 5). Averagely, about 47% companies used the fair value model whereas about 29% companies used the historical cost model. It cannot be neglected that averagely 23% companies did not disclose measurement basis for investment properties although IAS 40 requires it.

Table 4. Practices of subsequent measurement of investment properties

Subsequent measurement	2014.		2015.		2016.	
	No.	%	No.	%	No.	%
no investment properties	133	57.08	132	56.65	129	55.36
the historical cost model	16	6.87	20	8.58	22	9.44
the fair value model	27	11.59	35	15.02	34	14.59
do not disclose	21	9.01	14	6.01	13	5.58
no investment properties, but disclosed initial and/or subsequent measurement	28	12.02	23	9.87	27	11.59
excluded from the analysis	8	3.43	9	3.86	8	3.43
<i>total</i>	<i>233</i>	<i>100.00</i>	<i>233</i>	<i>100.00</i>	<i>233</i>	<i>100.00</i>

Source: Author's calculation

Table 5. Practices of subsequent measurement of investment properties for companies which have those assets in all three period of analysis

Subsequent measurement	2014.		2015.		2016.	
	No.	%	No.	%	No.	%
the historical cost model	16	26.23	18	29.51	20	32.79
the fair value model	26	42.62	30	49.18	29	47.54
do not disclose	18	29.51	12	19.67	12	19.67
excluded from the analysis	1	1.64	1	1.64	-	-
<i>total</i>	<i>61</i>	<i>100.00</i>	<i>61</i>	<i>100.00</i>	<i>61</i>	<i>100.00</i>

Source: Author's calculation

Repeated measures ANOVA (*Wilks' Lambda* = 0.908; $p = 0.064 > \alpha = 0.05$; *Partial Eta Squared* = 0.09) and Friedman's test (*Chi-Square* = 9.500; $df = 2$; $p = 0.009 < \alpha = 0.05$) show different results regarding statistical change of measurement basis for investment properties for companies which have those assets in all three period of analysis. Taking into account (a) that according to the central limit theorem in all samples $n \geq 30$ empirical schedule approximate to normal (Jovetić & Milanović, 2006, 276; Stojković, 2001, 294-297) and (b) the rest assumptions of parametric tests (Pallant, 2011, 207-208) we accepted result of repeated measures ANOVA. It means that measurement basis for investment properties did not statistically change during the period of the analysis.

Analysis of the companies which have investment properties in all three observed periods from the aspects of company size, legal form and basis used for financial reporting shows that sample companies are more likely to choose the fair value model for the subsequent measurement of investment properties than the historical cost model, from all mentioned aspects (see Tables 6, 7 and 8). Table 8 confirms the requirement contained in IFRS for SMEs (Section 16) that the fair value model is normally used for measurement of investment properties. However, the number of companies which do not disclose measurement base of investment properties is not negligible. It means that the quality of financial reporting on investment properties in Serbian manufacturing companies is not satisfactory and there is room and need for improvement.

Table 6. Practices of subsequent measurement of investment properties from the aspect of company size

Company size	Subsequent measurement	2014.		2015.		2016.	
		No.	%	No.	%	No.	%
micro	the historical cost model	1	100.00	1	100.00	1	100.00
	<i>total</i>	<i>1</i>	<i>100.00</i>	<i>1</i>	<i>100.00</i>	<i>1</i>	<i>100.00</i>
small	the historical cost model	2	16.67	2	16.67	2	16.67
	the fair value model	6	50.00	6	50.00	6	50.00
	do not disclose	4	33.33	4	33.33	4	33.33
	<i>total</i>	<i>12</i>	<i>100.00</i>	<i>12</i>	<i>100.00</i>	<i>12</i>	<i>100.00</i>
medium	the historical cost model	8	29.63	10	37.04	11	40.74
	the fair value model	13	48.15	13	48.15	13	48.15
	do not disclose	5	18.52	3	11.11	3	11.11
	excluded from the analysis	1	3.70	1	3.70	-	-
	<i>total</i>	<i>27</i>	<i>100.00</i>	<i>27</i>	<i>100.00</i>	<i>27</i>	<i>100.00</i>
large	the historical cost model	5	23.81	5	23.81	6	28.57
	the fair value model	7	33.33	11	52.38	10	47.62
	do not disclose	9	42.86	5	23.81	5	23.81
	<i>total</i>	<i>21</i>	<i>100.00</i>	<i>21</i>	<i>100.00</i>	<i>21</i>	<i>100.00</i>

Source: Author's calculation

Table 7. Practices of subsequent measurement of investment properties from the aspect of company legal form

Company legal form	Subsequent measurement	2014.		2015.		2016.	
		No.	%	No.	%	No.	%
limited liability company	the historical cost model	8	24.24	10	30.30	12	36.36
	the fair value model	16	48.48	19	57.58	17	51.52
	do not disclose	8	24.24	4	12.12	4	12.12
	excluded from the analysis	1	3.03	-	-	-	-
	<i>total</i>	<i>33</i>	<i>100.00</i>	<i>33</i>	<i>100.00</i>	<i>33</i>	<i>100.00</i>
stock company	the historical cost model	8	28.57	8	28.57	8	28.57
	the fair value model	10	35.71	11	39.29	12	42.86
	do not disclose	10	35.71	8	28.57	8	28.57
	excluded from the analysis	-	-	1	3.57	-	-
	<i>total</i>	<i>28</i>	<i>100.00</i>	<i>28</i>	<i>100.00</i>	<i>28</i>	<i>100.00</i>

Source: Author's calculation

Table 8. Practices of subsequent measurement of investment properties from the aspect of basis used for financial reporting

Basis used for financial reporting	Subsequent measurement	2014.		2015.		2016.	
		No.	%	No.	%	No.	%
full IFRS	the historical cost model	16	28.57	18	31.03	20	35.71
	the fair value model	23	41.07	27	46.55	24	42.86
	do not disclose	16	28.57	12	20.69	12	21.43
	excluded from the analysis	1	1.79	1	1.72	-	-
	<i>total</i>	<i>56</i>	<i>100.00</i>	<i>58</i>	<i>100.00</i>	<i>56</i>	<i>100.00</i>
IFRS for SMEs	the historical cost model	-	-	-	-	-	-
	the fair value model	3	75.00	3	100.00	5	100.00
	do not disclose	1	25.00	-	-	-	-
	excluded from the analysis	-	-	-	-	-	-
	<i>total</i>	<i>4</i>	<i>100.00</i>	<i>3</i>	<i>100.00</i>	<i>5</i>	<i>100.00</i>

Source: Author's calculation

CONCLUSIONS

We have examined financial reporting on investment properties on the basis of the random sample of 233 Serbian manufacturing companies. The research has shown that more than one half of the sample companies do not have investment properties in their statements of financial position. Companies which have investment properties are more likely to choose the fair value model for the subsequent measurement of investment properties than the historical cost model. It has been observed from the aspects of company size, legal form and basis used for financial reporting. We conclude that the research hypothesis can be accepted. The use of the fair value model for the subsequent measurement of investment properties can be considered justified because (a) fair value measurement gives users of financial statements more useful information than other measures, (b) rental income and changes in fair value are inextricably linked as integral components of the financial performance of an investment property and (c) an investment property generates cash flows largely independently of other assets held by an entity which makes the fair value model more appropriate for investment property than for owner-occupied property (IASB's arguments according to Cairns, 2014, 139). In addition to these arguments, it is important to emphasize that the entities using full IFRS (including IAS 40) have

to determine fair values of their investment properties regardless of the measurement model they choose. This means that entities, in any case, cannot avoid the cost of the fair value estimation. If fair values are already available, it is relatively easy and cheap for entities to use them for measurement in financial statements. However, we find that a significant number of companies did not disclose how they measured investment properties after initial recognition, which means that sample companies did not fully comply with IAS 40. In this regard, the findings in this paper are in line with the findings of some previous research conducted in Serbia dealing with accounting policies disclosures in the notes to financial statements (for example, Obradović & Karapavlović, 2016, 230), which implies that auditors and regulators of financial reporting should pay more attention to the disclosures on accounting policies in the notes to financial statements.

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CAPITAL ASSET PRICING MODEL VERSUS ARBITRAGE PRICING THEORY

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Abstract: *Capital Asset Pricing Model (CAPM) and Arbitrage Pricing Theory (APT) have been a major challenge for economic theorists and practitioners for decades. Unlike the well-documented contribution of these models to understanding the relationship between return and risk and valuing assets on the capital market in developed countries of the world, literature on the topic of the CAPM and APT models is relatively poor in the Republic of Serbia. This creates the need to process this issue in order to at least partially mitigate the insufficiency of domestic literature in this field. In this regard, the subject of research is a comparative analysis of the CAPM and APT models, with the inevitable critical review of these models and emphasizing their positive and negative aspects. The aim of the research is to find answers to the questions which of these models is superior and which corresponds more to reality. By presenting the realistic theoretical and practical range of CAPM and APT models, it was concluded that neither of these models is perfect and we can not talk about the general superiority of one or the other model, as both models contain equally serious imperfections that prevent them to accurately evaluate the assets. Indeed, the APT model achieves preponderance over the CAPM model in a theoretical, but not in a practical view. Practitioners still prefer to use the CAPM model, while the APT model is more useful in academic circles as theoretical construction with insufficient use in practice. The general conclusion and, at the same time, the main result of the research is that the APT model is the theoretical winner, and the CAPM model is the winner in practice. Due to the equal complexity of the problems that these models face, significant efforts have been made in empirical research and theoretical discussions to improve their accuracy and applicability. However, half a century of research was not enough to eliminate the imperfection of the CAPM and APT models, which does not reduce their significance as the starting point for the development of more advanced equilibrium models of asset valuation in the future.*

Keywords: *CAPM model, APT model, Expected return, Systemic risk, Risk factors*

JEL Classification: *G12*

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INTRODUCTION

Two basic directions of the development of Modern Portfolio Theory (MPT) are normative and positive portfolio theory. Normative portfolio theory, with its constituent elements: Markowitz model and index models, sought to determine the rules for making investment decisions and provide a systematic approach in determining a set of efficient portfolios and selecting optimal portfolios. On the other hand, the positive portfolio theory and its main representatives: CAPM and APT models, evaluate financial assets, assuming that all investors respect the rules for making investment decisions contained in the normative portfolio theory.

CAPM and APT models are equilibrium models for determining the prices of securities that imply the existence of a price balance, i.e. absence of undervalued and overvalued securities. As models of capital market equilibrium, the CAPM and APT models provide a significant contribution to understanding the relationship between return and risk and asset valuation in the capital market. Both models indicate the linear dependence of return and risk and the relevance of systemic risk only. However, the key difference lies in the fact that the CAPM model, in its essence, is an one-factor model, while the APT model is a multifactor asset valuation model that emerged as a response of critics to the appearance of the CAPM model (Leković, 2017).

Bearing in mind the above mentioned, the subject of research is a comparative analysis of the CAPM and APT models as the main representatives of the positive portfolio theory. The aim of the research is to better understand the real theoretical and practical range of these models. The intention is to enrich literature in this field in the Republic of Serbia, given the small number of domestic papers on the topic of CAPM and APT models.

In accordance with the defined subject and the set goal of the research, the authors start from the following hypothesis:

H₁: Although the multifactor APT model emerged as a critical response to the appearance of the one-factor CAPM model, the described asset valuation models feature similarity and complementarity.

H₂: We can not talk about the superiority of the CAPM or APT model, as both models contain equally serious imperfections that prevent them to accurately evaluate the assets.

The method of qualitative economic analysis will be used in the research, with the intention to provide valid conclusions about the investigated issues by studying the relevant financial literature and presenting the views of the authors.

Taking into account the defined subject, goal and hypotheses, after the introductory consideration, the differences between the CAPM and APT models will be analysed, with the inevitable presentation of the deficiencies and problems that these models face. After that, a comparative performance analysis of the CAPM or APT models will be done based on the results of relevant research. Finally, in the concluding part of the paper, the views on the confirmation of the hypothesis will be summarized, and open issues for future research will be considered.

COMPARATIVE ANALYSIS OF THE CAPM AND APT MODELS

The value of assets, or its price, according to the CAPM and APT models, is determined at the level that ensures that the expected return corresponds to the systemic risk assumed. The aim of both models is to ensure that all returns are equal at risk weighted basis. However, the key difference is the existence of one systemic risk factor in the CAPM model and multiple systemic risk factors in the case of the APT model. According to the CAPM model, the return of securities is a function of market risk, while according to the APT model, the return of securities is a function of a large number of unknown risk factors. Incorporating additional risk factors, the

APT model went a step further than the CAPM model, but the absence of their specification is a major drawback of this equilibrium model.

The CAPM model can also be seen as a special case of the APT model, which implies that market risk is the only risk factor. With this assumption, the equation of the multifactor APT model (Francis & Kim, 2013):

$$\bar{r}_i = r_f + \lambda_1\beta_{i1} + \lambda_2\beta_{i2} + \dots + \lambda_k\beta_{ik}, \quad (1)$$

where:

\bar{r}_i – the expected rate of return of the security i ,

r_f – the risk-free rate,

λ_k – factor risk premium related with the k -th factor,

β_{ik} – the sensitivity of return of the security i to the value of the factor k ,

is reduced to the equation with one factor:

$$\bar{r}_i = r_f + \lambda\beta_i. \quad (2)$$

Since the factor risk premium (λ) is equal to the ratio between surplus of return and risk $\left(\frac{\bar{r}_m - r_f}{\beta_m}\right)$, further follows:

$$\bar{r}_i = r_f + \beta_i \left(\frac{\bar{r}_m - r_f}{\beta_m}\right), \quad (3)$$

and how the beta coefficient of the market is equal to one ($\beta_m = 1$), an expression which represents the equation of the standard CAPM model is obtained:

$$\bar{r}_i = r_f + \beta_i(\bar{r}_m - r_f). \quad (4)$$

However, viewed from another angle, different variants of the APT model also can be understood as the application of the multifactor CAPM model. Therefore, it is not necessary to make premature judgments about the superiority of one or another model.

Based on the above mentioned, it can be concluded that the CAPM and the APT model are not competitive, but complementary models that complete each other, as evidenced by the common assumptions of these models (Šoškić, 2013, 244):

- investors prefer higher than a smaller amount of wealth,
- investors have risk aversion,
- the financial market is perfect and efficient,
- investor expectations are homogeneous.

The last two assumptions significantly simplify modern business conditions and limit the applicability of these models. Market perfection implies the absence of transaction costs, the lack of information asymmetry, and the inability of individual investors to affect the price of assets. On the other hand, market efficiency means that prices reflect all available information, which implies that there are no undervalued and overvalued securities in the financial market at any moment. In addition to the above described, a common assumption about the homogeneous expectations of investors is questionable, since it implies that all investors have exactly the same estimates of expected returns and risks.

The remaining assumptions on which these equilibrium models are built are much more restrictive and more numerous in the case of the CAPM model, which includes the assumptions originally set by Harry Markowitz. The alternative APT model is based on fewer less restrictive assumptions, so it is considered a more flexible and more liberal model. The APT model, unlike

the CAPM model, does not require a normal probability distribution of the rate of return on the securities, nor the determination of the real market portfolio. While the CAPM model requires the market portfolio to be effective, the APT model does not have specific requirements when the market portfolio is concerned. The APT model is based on the assumption that in the market equilibrium there is no possibility of obtaining a risk-free arbitrage profit. Therefore, the market portfolio has no similar significance in the APT model as in the CAPM model. However, the problem of specifying the risk factors that in general explain the price variability in the APT model, in its complexity, corresponds to the problem of basing the CAPM model on the incomprehensible market portfolio.

Due to the impossibility of exact presenting the economic reality, the CAPM and APT model are subject of critical review. The key drawback of the standard CAPM model is its foundation on unrealistic assumptions that greatly simplify the economic reality and market conditions of the economy. With the relaxation of certain assumptions, such as the assumption of non-existence of taxes, assumption about the absence of transaction costs, assumption about the homogeneous expectations of investors, etc., alternative two-factor and three-factor forms of CAPM model have been developed that correspond more to economic reality. Incorporating additional systemic risk factors, the single-factor CAPM model is transformed into a multifactor CAPM model that more successfully and fully explains the systemic variability of the returns of securities.

The study of the relevant financial literature indicates a continuous succession of the evidence for and against the validity of the standard CAPM model. Early testing of the CAPM model (Black et al., 1972; Sharpe & Cooper, 1972) resulted in the confirmation of its validity, although not complete accuracy, after that, this model was numerous criticized (Roll, 1977; Fama & French, 1992). The first serious criticism concerns the inability to adequately approximate the market portfolio through the selected market index. Also, the contribution of the beta coefficient to forecasting future returns is relativised, while the importance of other factors, such as company size and B/M (book to market) ratio, is emphasized. However, in contrast to critics of the CAPM model that have been tried to minimize the importance of the beta ratio, the followers of this model (Kim, 2002; Levy, 2010; Zhang & Wihlborg, 2010; Brückner et al., 2012) have been trying to minimize the the importance of criticism. It is important to note that the key criticism of the CAPM model that relates to the inability to determine the real market portfolio is, at the same time, an argument that prevents the rejection of its validity. The inability to determine the real market portfolio implies the inability to test the CAPM model, and therefore the impossibility of passing a final judgment on its validity. Therefore, the critical observations made in the financial literature are not proof against the standard CAPM model based on the market portfolio, but the proof against the derived CAPM model based on the selected market index (Leković, 2017). The succession of evidence for and against the validity of the standard CAPM model is also pointed out by Michailidis et al. (2006), Choudhary and Choudhary (2010), Olakoyo and Aide (2010), Alqisie and Alqurran (2016) and others.

On the other hand, the key shortcoming of the multifactor APT model is reflected in the fact that this model does not specify the systemic risk factors, which is why many attempts have been made in financial literature to evaluate them through factor analysis (Roll & Ross, 1980; Dhrymes et al., 1984), specification of macroeconomic factors (Faruque, 2011; Zhu, 2012; Jamaludin et al., 2017) and specification of microeconomic factors (Tudor, 2010; Uwubanmwenda & Obayagbona, 2012; Idris & Bala, 2015). Among macroeconomic risk factors, unexpected changes in inflation, level of economic activity, interest rates, etc., are highlighted, while the characteristics of securities and companies, for which is empirically confirmed that they are related to returns, are chosen as microeconomic risk factors: amount of dividend, size of the enterprise, uncertainty in earnings, P/E (price-earnings) ratio, B/M ratio,

financial leverage, etc. Despite numerous attempts, the aforementioned shortcoming of the APT model has not yet been eliminated, because of no relevant consensus has been reached in the financial literature on the most important systemic risk factors.

COMPARISON OF CAPM AND APT MODEL PERFORMANCES

In the financial literature, as an example of a direct comparison of the CAPM and APT model performances is most often cited the research carried out by Chen (1983). One of the tests applied was based on the following expression:

$$r_i = \alpha \tilde{r}_{i,APT} + (1 - \alpha) \tilde{r}_{i,CAPM} + e_i, \quad (5)$$

where:

$\tilde{r}_{i,APT}$ – the expected rate of return of the security i generated by the APT model,

$\tilde{r}_{i,CAPM}$ – the expected rate of return of the security i generated by the CAPM model.

Based on the previous equation, it is not difficult to conclude that the value of the alpha coefficient approximately equal zero gives priority to the CAPM model in relation to the APT model. On the other hand, the value of the alpha coefficient approximately equal to the unit gives priority to the APT model, in regard to the CAPM model. The results of the research showed that the estimated alpha coefficient had a value greater than 0.9 in the entire observed period from 1963 to 1978, as well as in the four analysed subperiods. Based on the above mentioned, the author concludes that the APT model is superior compared to the CAPM model. Also, the paper points out that the APT model is able to explain the anomalies that were left unclear by the CAPM model, and the best example is the size effect, i.e. small firm effect. The analysis found that the extra return on the shares of small enterprises becomes negligible by controlling the differences in factor sensitivity between the shares of small and the shares of large enterprises.

Proponents of claims that the multifactor APT model succeeds to explain the size effect also are Chan et al. (1985), Connor and Korajczyk (1986) and many others. Chan et al. (1985) researched the size effect in the period 1958-1977 by applying the multifactor APT model. The risk weighted differences between the shares return of 5% of the largest and 5% of the smallest companies listed on the New York Stock Exchange (NYSE) were set at the level between 1% and 2% per year. The fact that the differences between these returns before weighting were 12% annually testifies to the ability of the APT model to explain the size effect. The authors concluded that portfolios composed of shares of companies of different size, after weighting by the risk factors, do not have statistically significant different average returns. Among the involved factors, the unexpected change in industrial production, i.e. at the level of economic activity and the unexpected change in the risk premium, i.e. the difference in returns of low-quality and high-quality bonds explain most of the size effect.

On the other hand, Lehmann and Modest (1988) argue that the size effect is present also after controlling the differences in factor sensitivity between shares of small and large enterprises. They point out that the APT model is able to explain some anomalies such as the dividend effect, but that the size effect even after weighting by factor risks remains unclear. The authors conclude that the APT model still successfully evaluates most of the securities, since the size effect is concentrated in a small percentage of the largest and the smallest enterprises.

The APT model showed particularly clear superiority to the CAPM model in Japan. In contrast to other markets, in Japan, shares of small enterprises³ have a lower beta coefficient than shares

³ Small enterprises include all companies except hundred of the largest enterprises listed on the Tokyo Stock Exchange.

of large companies. According to the CAPM model, the lower beta coefficient should result in a lower expected return. However, shares of small enterprises consistently bring statistically significant higher returns compared to shares of large enterprises. On the other hand, the problem described loses its intensity and significance by applying a multifactor APT model. Therefore, in Japan, the APT model is almost universally used as a replacement for the CAPM model (Elton et al., 2011, 369).

Sun and Zhang (2001), Cagnetti (2002), Dhankar and Singh (2005), Muzir et al. (2010) and others also found evidence of the superiority of the APT model in relation to the CAPM model. Previously cited researches claim that the APT model is able to explain most of the anomalies that have remained unclear by the CAPM model. However, despite numerous advantages, this model did not succeed to replace the CAPM model. Some authors, like Bodie et al. (2009), claim that models such as the Fama-French three-factor model and Chen et al. (1986) model, represent the application of the multifactor CAPM model, rather than rejecting the essential ideas on which the CAPM model is based.

The reason for the absence of wider application of the APT model by the investment community lies in the greatest disadvantage of this model – the unnameability of factors that systematically affect the returns of securities. On the other hand, the CAPM model unequivocally argues that the covariance between the return of securities and the return of the market portfolio is the only systemic source of investment risk. The number of institutional investors who use the APT model when valuing and managing the assets is small. Among them, the most prominent is the *Roll & Ross Asset Management Corporation* (Sharpe et al., 1995, 333).

The APT model is more used in academic circles, than by investors and analysts in practice. Practitioners still prefer to use the CAPM model, primarily because of its simplicity and clearly defining the market risk, expressed by beta coefficient, as a systemic risk factor. However, it is useful to understand the limitations and get to know the realistic range of both models so that they would not be uncritically applied, but also not be *a priori* discarded (Pavlović & Muminović, 2005).

It should be highlighted that neither of these models do not succeed to accurately evaluate the assets and explain the variability in securities prices, but their role in improving the portfolio management function and measuring the realized investment performance is more than precious. The models described are a major challenge for both theoreticians and practitioners. For decades, they have been, and will surely be in the forthcoming period the subject of numerous empirical research and theoretical discussions, but also a useful basis for the development of more advanced, more contemporary and more accurate equilibrium models of asset valuation.

CONCLUSIONS AND RECOMMENDATIONS

The basic idea of the CAPM and APT models is that securities exposed to the same level of systemic risk should have the same level of expected return. The difference is that the CAPM model implies the existence of one, and the APT model the existence of more systemic risk factors. Valuation of securities is carried out in a manner that ensures that the expected return of the security corresponds to the systematic risk assumed, which is expressed by the beta coefficient as a measure of market risk in the CAPM model, and by the sensitivity of the return of securities to a greater number of unknown risk factors in the APT model. Thus, according to the CAPM model, investors require compensation for market risk, while according to the APT model, investors require compensation for more types of systemic risk. Both models include the absence of undervalued and overvalued securities, that is, the presence of entirely properly valued securities, which is in line with the Efficient Market Hypothesis (EMH) as a common starting point for these models.

Despite the fact that the multifactor APT model emerged as critics' response to the appearance of the one-factor CAPM model, the described asset valuation models feature similarity and complementarity. In support of this, not only are the numerous common assumptions of these models and the same conclusion about the linear dependence of the expected return and systemic risk, but also the fact that the CAPM model can be considered as a special case of an APT model that implies the application of market risk as the only risk factor. Similarly, the APT model, as already emphasized, can be understood as the application of the multifactor CAPM model. This confirms the validity of the first set hypothesis H_1 .

Since the problem of determining the market portfolio from the CAPM model is replaced by the equally large problem of selecting the systemic risk factors, the expected superiority of the APT model as a more flexible and more liberal model which avoids many restrictive assumptions of the CAPM model is not achieved. Although more suited to reality, the APT model is not a dominant applied model in practice. Financial analysts give a practical advantage to the CAPM model as a simpler model with a clearly defined systemic risk factor. The general conclusion is that the superiority of one or the other model can not be confirmed, since both models contain defects that prevent them from accurately evaluating the assets and explaining the variability of the price of securities. The models described are not perfect, but they are a useful basis for the development of more advanced asset valuation models. This represents a confirmation of the second set hypothesis H_2 .

The views presented have been developed with the aim of pointing to the real theoretical and practical range of the CAPM and APT models. The key limitation of paper is reflected in the fact that the theoretical, but not the empirical comparative analysis of these models has been carried out. The proposal for future research is the implementation of an adequate empirical analysis, based on the research described in the relevant foreign literature.

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CORPORATE INCOME TAX PLANNING AND FINANCIAL PERFORMANCE: EVIDENCE FROM SERBIA

Stefan Vržina¹

Abstract: *Corporate income tax planning refers to all activities undertaken to legally minimize corporate income tax liabilities. Significant number of companies, especially big and multinational, invest considerable resources in tax planning. This is not surprising given the empirical evidence showing that benefits of tax planning remarkably exceed invested resources. There are many methods to declare lower level of taxable income to national tax authorities, such as the transfer pricing arrangements between subsidiaries of multinational company. It could be expected that legal reduction of income tax expense leaves greater part of pre-tax income available for reinvesting or distribution to the owners, and positively influences company profitability and market value. However, previous research only partially confirm these theoretical assumptions. A lack of the clear line between tax planning and illegal tax evasion, as well as suspicion of rent diversion by managers may lead to negative market reaction to tax planning. Since tax planning can increase private benefits for shareholders and/or managers at the expense of society, tax planning opens some ethical issues. Many types of tax planning efficiency measures have been developed during previous decades. Current effective tax rate, i.e. ratio between current income tax expense and pre-tax income, will be used as a measure of tax planning efficiency in this paper.*

Most of the previous research has been conducted in countries with relatively high corporate income tax burden. On the other hand, with statutory tax rate of 15% and many types of tax incentives, Serbia can be regarded as a country with moderate corporate income tax burden. In this paper is examined whether tax planning influences profitability (measured with ROA and ROE ratios) and market value (measured with Tobin's Q and M/B ratio) of companies in Serbia, by using OLS regression and controlling for some company-specific and macroeconomic variables. Following previous literature findings, it is hypothesized that tax planning positively influences profitability and negatively influences market value of companies. A sample of 23 nonfinancial companies, quoted on the Belgrade Stock Exchange in the period between 2013 and 2016, is used. Initially, sample consists of 92 company-year observations. Research results from this study indicate that tax planning significantly and positively influences profitability and does not influence market value of companies. To author's knowledge, this is the first research of this type in Serbia. Research results can be of interest to company shareholders and managers as well as national tax authorities.

Keywords: *corporate income tax planning, effective tax rate, profitability, market value, Belgrade Stock Exchange.*

JEL Classification: *H26, M21, M41.*

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INTRODUCTION

Tax law flexibility and inconsistent international corporate tax system enable wide variety of methods of tax liabilities legal reduction. Together with value added tax and labor tax, corporate income tax (CIT) represents particularly important type of company taxes. Therefore, it is useful to examine the extent to which companies are efficient in the reduction of CIT liabilities.

Efficient CIT planning should enhance company financial performance. This paper investigates whether CIT planning significantly influences company profitability and market value. Therefore, research subject is the impact of CIT planning on company financial performance. In this context, in the paper is conducted an empirical research based on the sample of public stock companies from Serbia. Research results can be of interest for many groups. Managers and shareholders can be interested in determinants of profitability and market value of their companies. Furtherly, informations about effective CIT burden of Serbian quoted companies can be of interest for national tax authorities.

The structure of the paper is as follows. Section 2 presents theoretical background on CIT planning, while Section 3 presents related literature review and hypotheses development. Data and methodology are described in Section 4, while research results are presented in Section 5. Discussion of obtained results and conclusions are given in Section 6.

THEORETICAL BACKGROUND

In theory, tax planning² refers to legally approved activities, while tax evasion refers to illegal act of tax liabilities reduction. However, it is not possible to draw a clear demarcation line between tax planning and tax evasion in the real world. In other words, there is always a probability that certain tax planning method will be considered illegal by national tax authorities.

Big companies have a wide variety of opportunities to reduce taxable income declared to national tax authorities. Related-party transactions are one of the best-known methods of corporate tax planning. Sikka & Willmott (2010) stress that transfer prices (values of related-party transactions) are dominant tax planning method implying in increase of company wealth at the expense of public sector.

Companies invest considerable resources in tax planning, i.e. in accounting, legal and banking consultation to minimize tax liabilities (Christensen & Murphy, 2004). On the other hand, Mills et al. (1998) point out benefits of tax planning finding that every additional dollar invested in tax planning results in four dollars of reduction in tax liabilities. However, tax planning can be controversial from ethical aspect (Stainer et al., 1997) since the implementation of CIT planning methods requires considerable investment available only to biggest companies.

Value implications of CIT planning have been studied from two competing theoretical views. Khurana & Moser (2013) argue that traditional view, according to which tax planning entails transfer of wealth from government to company owners, should be supplemented with rent diversion effect and managerial opportunism as managers can engage in activities that maximize their wealth instead the wealth of company owners.

Efficient CIT planning should enhance profitability, leaving larger part of pre-tax income available for reinvesting or distribution to the owners. However, impact of CIT planning on company value is still unclear. CIT planning is traditionally viewed as value-enhancing activity (Desai & Dharmapala, 2009). On the other hand, many negative reactions of investors on CIT planning are possible. This should not be surprising given the fact that many CIT planning

² In the literature, there are many simultaneously used labels for legal tax liabilities reduction: tax planning, tax avoidance, tax optimization, tax management, tax minimization etc. In this paper, term “tax planning” is used.

methods, such as related-party transactions with tax haven entities, are based on abusive techniques and managerial malfeasance (Desai, 2005), so investors can be suspicious of legality of such methods despite positive auditor's opinion. In addition, tax audits are conducted ex-post so it is possible to retroactively consider certain CIT planning method as illegal.

Several measures of CIT planning efficiency have been developed in the past decades. Slemrod (2004) summarizes that effective tax rate (ETR) is most widely used measure of tax managers performance in biggest US companies. However, ETR can be calculated in several ways. Hanlon & Heitzman (2010) list three best-known ETRs:

- GAAP ETR – relation between total CIT expense and pre-tax income;
- Current ETR – relation between current CIT expense and pre-tax income and
- Cash ETR – relation between CIT paid and pre-tax income.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Prior research on impact of CIT planning on company financial performance has primarily been conducted in countries with high statutory CIT rate and/or weak tax incentives. Grubert & Mutti (1991) and Hines & Rice (1994) show that subsidiaries of multinational companies have lower profitability in countries with higher statutory CIT rate. These findings indicate that multinational companies are shifting their income to low-tax countries to pay as little tax as possible.

Assidi et al. (2016) find negative impact of GAAP ETR on Return on Assets (ROA) of Tunisian companies. They also find that this impact is more important for listed firms, concluding that listed firms are better able to optimize their tax burden.

Lazar (2011) finds that listed companies in Romania had higher ROA when difference between statutory CIT rate and current ETR was higher. However, this study does not find such link using Return on Equity (ROE) or profit margin instead of ROA. Pitulice et al. (2016) add that impact of ETR on net income and ROA is significantly negative in Romania.

Unlike previous research findings, Al-Jafari & Al Samman (2015) argue there is not significant impact of ETR either on profit margin or ROA of listed companies in Oman, primarily due to low statutory CIT rate.

Hasan et al. (2014) find that US companies with higher book-tax differences (difference between pre-tax income and taxable income) and lower cash ETR have higher cost of bank loans which negatively affects profitability. In such situations, banks anticipate additional tax risk of their clients. Following previous research findings, first hypothesis is defined as follows:

H₁: CIT planning positively influences company profitability.

Inclusion of stock price and market performance measures in analysis of CIT planning effects has been primarily conducted in countries with relatively liquid and efficient stock market. Desai & Dharmapala (2009) argue that global effect of CIT planning on market value (as measured by Tobin's Q) of US companies is insignificant. However, using corporate governance as mediatory variable, they find that CIT planning has positive impact on market value of well-governed companies with high institutional ownership.

Abdul-Wahab & Holland (2012) find negative impact of specially developed CIT planning measure on market value of companies listed on London Stock Exchange. Their finding is not influenced by corporate governance measures.

Brooks et al. (2016) use many CIT planning measures and find no relation between CIT burden and stock return of FTSE All-Share companies. They allow presence of "responsible" investors who care deeply about tax planning, but argue that for the vast majority of others it is not an

important issue. Choy et al. (2017) find significant abnormal negative return of non-financial FTSE 100 companies following the news about their broad tax haven involvement.

Chen et al. (2014) show that CIT planning tends to reduce market value of companies listed on Chinese Shenzhen Stock Exchange and that CIT planning does more harm than good for investors. They analyze impact of difference between statutory CIT rate and ETR on Tobin's Q.

Leite Santa & Rezende (2016) argue that the impact of book-tax differences on Tobin's Q of Brazilian companies is negative, which can be explained by the fact that investors are aware of the risks brought by high tax planning. Following previous research findings, second hypothesis is defined as follows:

H₂: CIT planning negatively influences company market value.

RESEARCH METHODOLOGY

Corporate Income Tax in Serbia

Taxation of corporate income in Serbia is prescribed by Corporate Profit Tax Law (The Official Gazette of the RS, no. 113/2017) and related by-laws. Current CIT system in Serbia is proportional with statutory tax rate of 15%, which can be regarded as a modest tax rate (KPMG, 2018). Gabrsek (2017) assesses current CIT system in Serbia as relatively flexible, considering modest statutory tax rate and long period for tax return filling and tax liability payment of 180 days.

Amount of CIT liability is determined in tax return after multiplication of taxable income by statutory tax rate and reduction of possible tax incentives amount. Taxable income is determined after corrections of pre-tax income from income statement, according to tax law. Corrections of pre-tax income refer to temporary and permanent differences between accounting standards and tax law in the treatment of certain expenses and revenues.

Due to temporary and permanent differences, it is possible that company records pre-tax income and pay zero CIT, as well as to record pre-tax loss and pay certain amount of CIT. As a result of such differences, ETR (relation between CIT expense and pre-tax income) can be considerably different from statutory CIT rate. Different tax incentives (such as investment tax credit) and tax loss carryforward can further reduce ETR.

Sample and Data

Empirical research covers non-financial public stock companies listed on the Belgrade Stock Exchange between 2013 and 2016. Research concentrates on firms whose stocks are (or were) included in Belexline index basket in order to ensure enough liquidity of sampled stocks.

First year of the analysis is 2013 given the fact that statutory CIT rate is increased from 10% to current 15%, effective from 1st January 2013. The sample consists of companies that recorded positive result (income) before taxation in at least one year between 2013 and 2016. If sampled company prepares both statutory and consolidated financial statements, financial data are retrieved from the consolidated ones.

Initial sample consists of 23 companies and 92 company-year observations. Eight observations were excluded due to negative result (loss) before taxation, since ETR is negative and useless for analysis in such cases (Dyrenge et al., 2008). Furthermore, for five observations stock price data is unavailable due to stocks delisting. Final sample represents unbalanced panel data with 79 company-year observations. Table 1 shows sample description.

Table 1. Sample Description

	Number of observations				
	2013	2014	2015	2016	Pooled
Panel A. Regional structure of the sample					
Vojvodina	4	4	4	2	14
Belgrade	11	11	11	9	42
Sumadija and Western Serbia	3	3	3	3	12
Southern and Eastern Serbia	3	3	3	2	11
Pooled	21	21	21	16	79
Panel B. Industry structure of the sample					
Mining and quarrying	1	1	1	1	4
Manufacturing	12	12	12	9	45
Construction	4	4	3	2	13
Transportation and storage	3	2	3	2	10
Professional, scientific and technical activities	1	2	2	2	7
Pooled	21	21	21	16	79

Necessary financial data and stock price data are retrieved from the websites of The Serbian Business Registers Agency (www.apr.gov.rs) and Belgrade Stock Exchange (www.belex.rs).

Research Model

Research examines the impact of current effective tax rate (ETR), as a CIT planning measure, on company profitability and market value. In the research are used ROA and Tobin's Q as profitability and market value measures, respectively. To test sensitivity of obtained results, ROE and M/B (Market-to-Book) ratio are used as alternative profitability and market value measures, respectively.

Abdul-Wahab & Holland (2012) use stock price in the period of three months after the end of financial year to capture a time lag in disclosing annual financial statements. However, in this paper is used period of six months, since the deadline to submit financial statements in Serbia is six months after the end of financial year. Following previous research, some company-specific control variables are included in the research model: total assets – ASSET (Chen et al., 2014; Assidi et al., 2016; Pitulice et al., 2016) and debt ratio – DEBTR (Chen et al., 2014; Assidi et al., 2016). Since Fairfield & Yohn (2001) argue that changes in asset turnover ratio (ATR) can partially explain changes in profitability, ATR is used as additional company-specific control variable. Research also includes two macroeconomic control variables: consumer index prices inflation rate (INFL) and annual gross domestic product growth rate (GDP). Table 2 shows definitions of variables.

In the line with presented variables, Ordinary Least Squares (OLS) regression research model is defined as follows:

$$PERF_{i,t} = \alpha + \beta_1 ETR_{i,t} + \beta_2 ASSET_{i,t} + \beta_3 DEBTR_{i,t} + \beta_4 ATR_{i,t} + \beta_5 INFL_t + \beta_6 GDP_t + \varepsilon_{i,t} \quad (2)$$

where $PERF_{i,t}$ relates to dependent variables ROA, ROE, Q and M/B.

Statistical data processing is conducted using statistical software IBM SPSS (Statistical Package for Social Sciences), version 21.

Table 2. Variable definition

Variable label	Variable formula
Panel A. Dependent variables	
ROA	$(\text{Net income} / \text{Total assets}) \times 100$
ROE	$(\text{Net income} / \text{Equity}) \times 100$
Q	$(\text{Total assets} - \text{Book value of equity} + \text{Market value of equity}) / \text{Total assets}$
Market value of equity	Number of outstanding stocks x Stock price on 30 th June following year
M/B	Stock price on 30 th June following year / Book value per stock
Panel B. Independent variables	
ETR	$(\text{Current CIT expense} / \text{Pre-tax income}) \times 100$
ASSET	Natural logarithm of total assets (in 000 Serbian dinars)
DEBTR	Total debt / Total assets
ATR	Sales revenue / Total assets
INFL	According to World Bank data (data.worldbank.org/country/serbia)
GDP	According to World Bank data (data.worldbank.org/country/serbia)

RESEARCH RESULTS

Descriptive Statistics

Table 3 shows descriptive statistics for all variables included in analysis. Due to very high extreme values, it is more appropriate to rely on median results rather than mean results.

Table 3. Descriptive statistics

Panel A. Company-specific variables				
n = 79	Mean	Median	Minimum	Maximum
ROA (%)	6.8286	4.4846	-0.4127	23.1147
ROE (%)	10.9815	7.8765	-0.4786	33.6930
Q	0.8696	0.7958	0.2399	2.3849
M/B	0.7806	0.5381	0.1022	3.0443
ETR (%)	16.9216	13.0932	0.0000	106.1157
ASSET	15.7835	15.6947	13.8538	19.7406
DEBTR	0.3632	0.3523	0.0446	0.8343
ATR	0.7963	0.7842	0.0878	2.2149
Panel B. Macroeconomic variables				
	Year			
	2013	2014	2015	2016
INFL (%)	7.6943	2.0824	1.3924	1.1223
GDP (%)	2.5717	-1.8313	0.7577	2.7973

Median of ETR in sampled companies is 13.0932%, which is below statutory CIT rate of 15%. In nine observations (11.39% of the sample) companies have zero CIT expense and ETR of 0% despite recorded pre-tax income. Furthermore, in 47 observations (59.49%) ETR is lower than statutory CIT rate of 15%, while in one observation ETR is higher than 100%.

There are five observations in the sample with ROA above 20% and 17 observations with ROE higher than 20%. Net loss is recorded in two observations despite recorded income before taxation. Market value measures, Tobin's Q and M/B ratio, have mean and median values below one, which can be indication of low valuation of sampled companies by investors and potential

inefficiency of Serbian stock market. Sampled companies have relatively low indebtedness level. DEBTR is higher than 50% in 26 observations. In addition, only 17 observations have ATR higher than one.

Correlation Analysis

Table 4 shows Pearson's and Spearman's correlation matrix between variables included in analysis and their significance level. The highest correlation between independent variables is $r = 0.413$ (between DEBTR and ATR), so problems with multicollinearity are not expected. Contrary to independent variables, there is high correlation between dependent variables. High correlation appears between profitability measures, ROA and ROE ($r = 0.843$) as well as market value measures, Tobin's Q and M/B ratio ($r = 0.934$). There is also significant correlation between profitability and market value measures. In the taxation context, ETR has significant and negative, but weak, correlation with both profitability measures. Correlation between ETR and both market value measures is not significant.

Table 4. Correlation matrix

n = 79	ETR	ASSET	DEBTR	ATR	INFL	GDP	ROA	ROE	Q	M/B
ETR	1.000	0.048	-0.011	0.051	0.034	-0.042	***-0.422	***-0.431	-0.059	0.054
ASSET	0.014	1.000	0.184	*-0.220	-0.067	0.002	0.095	*0.197	***0.413	***0.368
DEBTR	0.000	**0.244	1.000	***0.490	0.112	-0.097	***-0.310	0.018	0.168	-0.167
ATR	-0.008	*-0.210	***0.413	1.000	0.080	0.042	0.042	*0.218	0.066	-0.089
INFL	0.077	-0.038	0.061	0.102	1.000	** -0.277	-0.083	-0.055	-0.078	-0.060
GDP	0.042	0.000	-0.054	0.049	***0.410	1.000	0.044	0.030	-0.107	-0.068
ROA	***-0.374	0.025	***-0.336	0.161	-0.003	0.045	1.000	***0.919	***0.465	***0.532
ROE	***-0.411	0.154	0.078	***0.346	0.023	0.058	***0.843	1.000	***0.520	***0.478
Q	-0.037	***0.304	0.132	-0.003	-0.086	-0.113	***0.476	***0.502	1.000	***0.848
M/B	0.013	**0.263	-0.041	-0.068	-0.053	-0.066	***0.484	***0.464	***0.934	1.000

Note: Pearson's correlation coefficients r below diagonal; Spearman's correlation coefficients ρ above diagonal. Statistically significant at 1% (***), 5% (**) and 10% (*).

Regression Analysis

Table 5 shows OLS regression estimates with four alternative regression models reported. The estimated coefficients indicate that company profitability increases with decrease of ETR. However, this impact is relatively weak which can be explained by modest statutory CIT rate, presence of tax incentives that reduce ETR and many observations with ETR of 0%.

Table 5. Results of the OLS regression analysis

Dependent	ROA	Tobin's Q	ROE	M/B ratio
Constant	-11.202 (-1.501)	-0.520 (-0.920)	-27.120** (-2.297)	-1.334 (-1.463)
ETR	-0.377*** (-4.187)	-0.033 (-0.299)	-0.414*** (-4.421)	0.013 (0.113)
ASSET	0.273*** (2.757)	0.309** (2.519)	0.311*** (3.019)	0.311** (2.505)
DEBTR	-0.594*** (-5.564)	0.029 (0.218)	-0.198* (-1.781)	-0.146 (-1.086)
ATR	0.459*** (4.341)	0.059 (0.451)	0.487*** (4.425)	0.062 (0.468)
INFL	0.027 (0.274)	-0.040 (-0.324)	0.015 (0.145)	-0.009 (-0.076)
GDP	-0.005 (-0.054)	-0.097 (-0.792)	0.035 (0.337)	-0.074 (-0.595)

Adjusted R ²	0.373	0.039	0.321	0.013
F-value	8.734***	1.533	7.146***	1.173

Note: Standardized beta coefficients in front of the brackets; t-statistics in the brackets. Statistically significant at 1% (***), 5% (**) and 10% (*).

All company-specific control variables have significant impact on ROA. It appears that ASSET and ATR positively influence, while DEBTR negatively influences ROA. Macroeconomic control variables are not significantly related to company profitability.

Regression results with Tobin's Q as dependent variable are considerably different. This regression model poorly explains variations of Tobin's Q, since F-value is very low and insignificant. ETR is not significant determinant of company market value as measured by Tobin's Q. In addition, other company-specific and macroeconomic control variables, except for ASSET, do not have significant impact on Tobin's Q. Presented regression results indicate that investors do not incorporate effective CIT burden in valuation of company stocks. It is possible that investors consider CIT expense as any other company expense category. It is also possible that investors do not consider CIT as important economic category since relatively low ETR of sampled companies.

As a sensitivity test of regression results, ROE and M/B ratio are employed as dependent variables. Results of these regression models are almost similar to regression results with ROA and Tobin's Q as dependent variables. Impact of ETR on ROE is significantly negative, but still weak, although this impact is stronger than impact of ETR on ROA. Among company-specific control variables, ASSET, DEBTR and ATR are still significant determinants of company profitability.

Quality of regression model that examines impact of CIT planning on company market value is not enhanced using M/B ratio as a dependent variable. ETR is still not significant determinant of company market value. Except for ASSET, company-specific and macroeconomic control variables do not significantly impact company market value as measured by M/B ratio.

DISCUSSION AND CONCLUSIONS

Research in this paper included 23 non-financial public stock companies in Serbia to explore the impact of CIT planning on company financial performance. Empirical analysis showed that ETR in median Serbian public stock company is below statutory CIT rate since many companies are able to record ETR of 0% despite recorded pre-tax income.

OLS regression estimates showed that there is significant influence of CIT planning on company profitability. Profitability increases with decrease in ETR. This finding is in line with some previous studies (Lazar, 2011; Assidi et al., 2016; Pitulice et al., 2016). However, the influence of ETR on profitability is relatively weak due to relatively low ETR. Therefore, first research hypothesis cannot be rejected.

Impact of CIT planning on company market value is not statistically different from zero. This finding is consistent with previous studies of Desai & Dharmapala (2009) and Brooks et al. (2016). Defined regression model is relatively weak in explaining company market value variability. When comparing given results with previous research findings, it is necessary to consider that Serbian stock market efficiency and liquidity significantly deviates from the developed stock markets analyzed in previous research (USA, Great Britain, China, Brazil etc). Therefore, second research hypothesis is rejected.

Research results are robust to changes in profitability and market value measures. Results of the research indicate that managers and owners of companies should strive for further reduction of ETR in order to be more profitable, though ETR minimization might not be directly valued on

the capital market. On the other hand, the main limitation of the paper refers to sampling method, since number of sampled companies is relatively small due to low liquidity and efficiency of Belgrade Stock Exchange. In addition, Dyreng et al. (2008) argue that long-term ETRs (for example, ten-year) are more useful in analysis than annual ETRs due to high variations of annual ETRs.

Future research should examine the impact of other ETRs (GAAP ETR or Cash ETR) on company financial performance. Future research should also include more control variables, as well as mediatory variables (such as corporate governance indicators).

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RELATION BETWEEN CORPORATE SOCIAL RESPONSIBILITY REPORTING AND FINANCIAL INDICATORS OF SERBIAN COMPANIES

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Abstract: *Corporate social responsibility became a powerful mean for gaining competitive advantage. Numerous benefits from applying CSR were identified. Publishing information about CSR is becoming very important tool for communication with stakeholders. Many research showed that publishing CSR information and investing in CSR result in higher financial indicators and increased share and market value. Still, research on the relation between CSR and financial performance showed diverse findings. The subject of this paper was relation between publishing CSR information and financial indicators of Serbian companies. The basic assumption was that companies which publish CSR reports had better financial indicators than companies which do not publish CSR reports and that there was a significant difference between these companies in those indicators. The main goal was to show that publishing CSR reports/information had an influence on financial indicators. The additional goals were to show that the most companies in Serbia which published CSR reports were large companies, mostly part of MNC; to show that medium and small companies still were not active in this field, and to show that there were differences in naming of published reports. The analysis was done on a sample of 100 top companies by net profit from the list of 100 Top companies in the Republic of Serbia in 2016 published by Business Registers Agency. Firstly, companies were grouped into two groups: companies which published CSR reports and companies which did not publish CSR reports. And then for additional analysis, three groups were made: companies which published CSR reports; companies which published CSR information on companies' web site, but did not publish reports about it, and companies which did not provide any information about CSR, in order to determine differences in financial indicators among groups. Results confirmed the assumption that companies in Serbia which published CSR reports had higher financial indicators than those which did not publish any reports. The results could emphasize the relevance of CSR reporting because in Serbia has not been given enough attention to this field yet.*

Keywords: *Corporate social responsibility, financial indicator, reporting*

JEL Classification: *M 14, M 21, L 21, G 3*

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INTRODUCTION

CSR represents a language and a perspective that is known over the world and has become increasingly vital as stakeholders have communicated that modern businesses are expected to do more than make money and obey the law (Carroll, 2015, p. 87). Companies, beside profits, should be dedicated to making positive contribution to the society through different business solutions and management systems focused on all business stakeholders. Companies should contribute to economic, social and ecological prosperity. A way to communicate its dedication is publishing CSR reports in which companies could explain in details its activities and achieved results.

Investing in social responsibility can result in competitive advantage by attracting resources and high quality employees, differentiating its products and services, reducing its exposure to risk, etc (Vitezić, Vuko & Morec, 2012, p. 42). Many research showed that publishing CSR reports and investing in CSR results in higher financial indicators and increased share and market value. The analysis of representation of concepts (CSR and financial performance) in academic publications was done through Google Scholar and it showed that there was more than 3 million of publication, nearly 210.000 of publications in last decade. Similar analysis was done using SCIndeks base, but there was not any publication about this relation, especially not among Serbian companies. This was a main motive for conducting this research. Many previous research done around the world showed inconclusive results about the relation between CSR and financial performance. The subject of this paper was relation between publishing CSR information and financial indicators of Serbian companies, as similar research had not been done. Publications, in form of reports or news/activities on companies' web sites, about CSR have significant influence at all stakeholders. The aims were to show if companies published CSR information in some way, to show which companies published CSR information and to show that publishing CSR information was not still a practice among the most of Serbian companies. The basic assumption was that companies which publish CSR reports had better financial indicators than companies which did not publish CSR reports and that there was a significant difference between these companies in those indicators.

The paper was organized in the following way. Relevant literature review was given in the second section of the paper. The third section was dedicated to the explanation of applied methodology, where the subject, assumption and goals were given and applied methods were explained. The results were presented in the fourth section along with results' discussion. The conclusions were given in the fifth section.

LITERATURE REVIEW

The CSR report could be one of the most important documents through which company shows its commitment to CSR and irreplaceable tool, in addition to compulsory financial reports, which enables company to inform stakeholders about real condition of the company (Carnevale, Mazzuca & Venturini, 2012). CSR reporting refers to a holistic view of business results, which includes financial, social and environmental component of the overall results (Stojanović-Aleksić, Erić-Nielsen & Bošković, 2016, p. 41). Voluntary disclosure signals the management's desire to disclose its superior performance to external parties, because it will enhance the reputation of the company and its position in the market (Vitezić, Vuko & Morec 2012, p. 42). There is a growing pressure in the world that companies should publish CSR reports along with traditional financial reports. The research results from the KPMG Survey of Corporate Responsibility Reporting 2015 which included 45.000 companies showed growth in corporate responsibility reporting, more than 70% of companies report about CSR (KPMG, 2015). Also, about 95% of Global Fortune 250 and many other companies voluntarily publish CSR reports (Carroll, 2015). Companies are motivated to publish CSR reports because it legitimizes its

behavior, inform, and change perceptions and expectations of the stakeholders. CSR reporting could be a relevant tool for analyzing stakeholders' needs, identifying risks and achieving a competitive advantage on the market (Markota Vukić, 2015, p. 65). Transparent and credible CSR report should be seen as a sign of stability and effective risk management by companies (Baron, 2014, p. 13).

Some companies publish separate sustainability or CSR report, some other make it a separate chapter within the annual report while other just publish information about CSR activities on companies' web sites (Litfin et al, 2017). Preparation of these reports has been a challenge for companies, especially in countries where it is not compulsory to publish them. United Nation Global Compact gives recommendation to its member to apply sustainability principles in preparing report. Global Reporting Initiative also gives guidelines and indicators to transparently present economic, ecological and social activities of a company. EU also gave Non-Financial Reporting Directive which should be implemented in national legislation.

The increased global trend in CSR reporting is mostly seen in global multinational companies (MNC). Small and micro companies adopt concept of CSR very slowly because companies lack resources to be employed in activities that are not directly related to its business processes (Argueta & Pereira, 2014, p. 127). Even though they have significant part in job creation and economic prosperity, small businesses are thought to have considerable environmental impacts by accounting for 60% of all carbon dioxide emissions and 70% of all pollution (Nejati, Amran & Ahmad, 2015, p. 2). Previous studies indicate that maintaining a good reputation among neighbours and community is very crucial for small businesses (Nejati, Amran & Ahmad, 2015, p. 7). Today's society and stakeholders require more transparency, more information from the companies, so also SMEs have to start doing something they may not have done before, start using some new tools, some new performance indicators (Knopf & Mayer-Scholl, 2013, p. 9). It becomes critical for SMEs to engage in CSR activities and report about it.

Given that CSR reporting is not mandatory, large number of Serbian companies does not report about CSR, because they do not realize the need and the purpose of these reports. Some companies publish information about their CSR activities at their web sites as news, but the most of them do not publish reports. National strategy for development and promoting CSR in Serbia from 2010 emphasized that reporting about non-financial performances, i.e. about influences at society and environment, is the weakest link in the system of CSR. CSR Forum Serbia established a reward for contribution to the development of non-financial reporting which should promote and improve CSR reporting in Serbia. The results of this research could also raise awareness among Serbian companies about the need and the benefits of CSR reporting.

Many research had been done in order to determine the relation between CSR and financial performance in the last thirty years, but the results are still inconclusive because some results showed positive relation, some showed negative relation and some even that there was not a relation at all (Carnevale, Mazzuca & Venturini, 2012, Ivić & Grubišić, 2013, Margolis & Walsh, 2003). Results could differ because of different theoretical foundations, different methodological approach, sample size, variables, time period, etc (Vitezić, 2011, p. 425). This relation needs further research.

METHODOLOGY

The subject of this paper was relation between publishing CSR information and financial indicators of Serbian companies. The basic assumption was that companies which publish CSR reports had better financial indicators than companies which did not publish CSR reports and that there was a significant difference between these companies in those indicators. There were several additional assumptions: companies which publish CSR reports had higher financial

indicators than companies which did not publish any information; then companies which published CSR information on companies' web site, but did not publish reports about it had higher financial indicators than companies which did not publish any information. The main goal was to show that publishing CSR reports/information had an influence on financial indicators. The additional goals were to show that the most companies in Serbia which published CSR reports were large companies, mostly part of MNC; to show that medium and small companies in Serbia still were not active in this field, and to show that there were differences in naming of published reports.

The analysis was done on a sample of 100 top companies by net profit from the list of 100 Top companies in the Republic of Serbia in 2016 published by Business Registers Agency. For the purpose of the analysis, first, companies were grouped into two groups: companies which published CSR reports and companies which did not publish CSR reports. Additional analysis required the creation of three groups: companies which published CSR reports; companies which published CSR information on companies' web site, but did not publish CSR reports, and companies which did not provide any information about CSR. Financial indicators calculated for this analysis, which were most often used in similar research (Platonova et al. 2018, Khan & Tariq, 2017, Cornett, Erhemjamts & Tehranian, 2016, Pan et al., 2014, Ivić & Grubišić, 2013, Chien & Peng, 2012, Vitezić, 2011), were Return on Assets (ROA), Return on Equity (ROE) and Total Assets Turnover Ratio (TATR). Descriptive analysis, t-tests, Kruskal Wallis test and Mann-Whitney U tests were done using SPSS program.

RESULTS AND DISCUSSION

The research showed that the most companies did not publish any report regarding corporate social responsibility or sustainability. Only 28% of companies published independent CSR or sustainability reports (Table 1). Only one company published CSR information in their annual report. There was 33% of companies which presented some information about protecting the environment and dedication to social goals and activities which were done in the past on company's web sites, but they did not publish any formal report about it. It is usually considered that most companies in developing countries which publish some kind of CSR report are part of multinational companies. In our sample 42% of companies were part of MNC. Among them, almost 62% published CSR, sustainability report or presented these information as a part of annual reports. Companies which were not the part of MNC consisted 58% of the sample, and among them only 5.2% published CSR reports (Table 2). When it comes to company's size, 76% were large companies, 18% were medium companies and small and micro companies were 4% and 2%, respectively. Small and micro companies did not publish anything about CSR. There was 34.2% of large companies and 16.8% of medium companies which published CSR or sustainability reports, while 40.8% of large companies and 11.1% of medium companies published information about CSR activities on companies' web sites (Table 3).

Table 1. Percentage of companies publishing CSR information

Type of report	Percent
Non	38.0
Sustainability report	20.0
CSR report	6.0
CSR & sustainability report	2.0
Part of annual report	1.0
Company web site	33.0
Total	100.0

Source: Author's work

Table 2. Publishing CSR reports depending on if company is a part of MNC or not

Part of MNC	Type of report	Frequency	Percent
Not part of MNC	Non	33	56.9
	CSR report	3	5.2
	Company web site	22	37.9
	Total	58	100.0
Part of MNC	Non	5	11.9
	Sustainability report	20	47.6
	CSR report	3	7.1
	CSR & Sustainability report	2	4.8
	Part of annual report	1	2.4
	Company web site	11	26.2
	Total	42	100.0

Source: Author's work

Table 3. Publishing CSR reports depending on companies' size

Company size	Type of report	Frequency	Percent
Large	Non	19	25
	CSR, sustainability, annual report	26	34.2
	Company web site	31	40.8
	Total	76	100
Medium	Non	13	72.2
	CSR, sustainability, annual report	3	16.8
	Company web site	2	11.1
	Total	18	100
Small	Non	4	100
	Total	4	100
Micro	Non	2	100
	Total	2	100

Source: Author's work

Financial indicators (Return on Assets (ROA), Return on Equity (ROE) and Total Assets Turnover Ratio (TATR)) were calculated for all companies and the descriptive statistics are given in Table 4 depending on if company published some information about CSR.

Table 4. Descriptive statistics for financial indicators depending on if company published some information about CSR

Indicator	Reporting	Mean	Variance	Std. Deviation
ROA	non	0.3064	0.105	0.32362
	CSR, sustainability, annual report	0.1228	0.0976	0.08703
	web site	0.1064	0.003	0.05825
ROE	non	0.5387	0.342	0.58469
	CSR, sustainability, annual report	0.2138	0.039	0.19790
	web site	0.2132	0.022	0.14784
TATR	non	0.8872	0.657	0.81063
	CSR, sustainability, annual report	1.4157	1.061	1.02993
	web site	0.9337	0.186	0.43140

Source: Author's work

In order to examine if there was statistically significant difference between means of ROA, ROE and TATR between companies which published CSR reports and those which did not, t-tests were done. Since Levene's test for equality of variances showed that variances of these two groups were not equal, the results of t-tests were used for the assumption that equal variances were not equal. The results showed that there was a statistically significant difference between means of ROA between companies which published CSR reports ($M=0.1228$, $SD=0.08703$) and those which did not publish CSR reports ($M=0.2134$, $SD=0.25884$); $t(95.771) = 2.610$, $p=0.011$. The difference between means of ROA among groups (mean difference = 0.09058, 95% Confidence interval: from 0.02168 to 0.15948) was moderate (Eta squared was 0.06). There was statistically significant difference between means of ROE between companies which published CSR reports ($M=0.2138$, $SD=0.1979$) and those which did not publish CSR reports ($M=0.3874$, $SD=0.46629$); $t(97.802) = 2.613$, $p=0.010$. The difference between means of ROE among groups (mean difference = 0.17357, 95% Confidence interval: from 0.04174 to 0.3054) was moderate (Eta squared was 0.07). There was statistically significant difference between means of TATR between companies which published CSR reports ($M=1.4157$, $SD=1.02993$) and those which did not publish CSR reports ($M=0.9088$, $SD=0.65799$); $t(37.695) = -2.454$, $p=0.019$. The difference between means of TATR among groups (mean difference = -0.50689, 95% Confidence interval: from -0.9252 to -0.08857) was moderate (Eta squared was 0.06).

In order to expand the analysis, companies were divided into three groups: companies which published CSR reports (Group A); companies which published CSR information on companies' web site, but did not publish reports about it (Group B), and companies which did not provide any information about CSR (Group C). As the assumption about equality of variances was not fulfilled, Kruskal Wallis test was done in order to determine if there was statistically significant difference between these three groups in the levels of ROA, ROE and TATR.

Kruskal Wallis test showed that there was statistically significant difference in the level of ROA between three groups of companies (Group A, $n=29$, Group B, $n=33$, Group C, $n=38$), $\chi^2(2, n=100) = 16.221$, $p=0.000$. Companies which did not provide any information about CSR (Group C) had higher median ($Md=0.1674$) than other two groups (Group A, $Md=0.0976$, Group B, $Md=0.1026$). Mann-Whitney U test showed that there was statistically significant difference in the level of ROA between Group C ($Md=0.1674$, $n=38$) and Group A ($Md=0.0976$, $n=29$), $U=309$, $z=-3.062$, $p=0.002$, $r=-0.37$. Mann-Whitney U test showed that there was statistically significant difference in the level of ROA between Group C ($Md=0.1674$, $n=38$) and Group B ($Md=0.1026$, $n=33$), $U=305$, $z=-3.712$, $p=0.000$, $r=-0.44$. Mann-Whitney U test showed that there was not statistically significant difference in the level of ROA between Group A ($Md=0.0976$, $n=29$) and Group B ($Md=0.1026$, $n=33$), $U=452$, $z=-0.374$, $p=0.709$, $r=-0.04$.

Kruskal Wallis test showed that there was statistically significant difference in the level of ROE between three groups of companies (Group A, $n=29$, Group B, $n=33$, Group C, $n=38$), $\chi^2(2, n=100) = 12.193$, $p=0.002$. Companies which did not provide any information about CSR (Group C) had higher median ($Md=0.3151$) than other two groups (Group A, $Md=0.1344$, Group B, $Md=0.1718$). Mann-Whitney U test showed that there was statistically significant difference in ROE between Group C ($Md=0.1674$, $n=38$) and Group A ($Md=0.0976$, $n=29$), $U=321$, $z=-2.911$, $p=0.004$, $r=-0.36$. Mann-Whitney U test showed that there was statistically significant difference in the level of ROE between Group C ($Md=0.1674$, $n=38$) and Group B ($Md=0.1026$, $n=33$), $U=368$, $z=-2.986$, $p=0.003$, $r=-0.35$. Mann-Whitney U test showed that there was not statistically significant difference in the level of ROE between Group A ($Md=0.0976$, $n=29$) and Group B ($Md=0.1026$, $n=33$), $U=438$, $z=-0.571$, $p=0.568$, $r=-0.07$.

Kruskal Wallis test showed that there was statistically significant difference in the level of TATR between three groups of companies (Group A, $n=29$, Group B, $n=33$, Group C, $n=38$), $\chi^2(2, n=100) = 6.549$, $p=0.038$. Companies which published CSR reports (Group A) had higher

median (Md=1.0526) than other two groups (Group B, Md=0.8490, Group C, Md=0.7209). Mann-Whitney U test showed that there was statistically significant difference in the level of TATR between Group C (Md=0.1674, n=38) and Group A (Md=0.0976, n=29), $U=363$, $z=-9.379$, $p=0.017$, $r=-0.29$. Mann-Whitney U test showed that there was not statistically significant difference in the level of TATR between Group C (Md=0.1674, n=38) and Group B (Md=0.1026, n=33), $U=523$, $z=-1.199$, $p=0.231$, $r=-0.14$. Mann-Whitney U test showed that there was not statistically significant difference in the level of ROE between Group A (Md=0.0976, n=29) and Group B (Md=0.1026, n=33), $U=359$, $z=-1.686$, $p=0.092$, $r=-0.21$.

Presented results showed that even we used in this analysis the list of the most successful companies in Serbia by net profit, less than one third of companies reported about CSR. Large companies, especially those which were part of MNC, had a leading role in this field. Small and micro companies had not still started publishing CSR information. Companies which published CSR reports had higher levels of ROA, ROE and TATR than companies which did not publish any reports. But when companies which did not publish reports and companies which published some CSR information on companies' web sites were separated into two groups, the results had slightly been changed. There was significant difference in the levels of ROA, ROE and TATR between companies which did not publish anything and companies which published CSR reports and between companies which did not publish anything and companies which published CSR information on web sites in the levels of ROA and ROE, but not in TATR, while there was not a significant difference between companies which published CSR reports and companies which published CSR information on web sites in either of indicators.

CONCLUSIONS AND RECOMMENDATIONS

Previous research showed that companies had engaged in publishing CSR information and reports mostly if they were a part of MNC and that this is a field of interest for large companies (Markota Vukić, 2015, Stanisavljević, 2017, Lopez Vazquez & Fornes, 2015). Medium and small companies did not still recognize the need to apply CSR concept at all, especially not the need to publish information about CSR activities. Publishing CSR reports is still an area reserved for large companies, especially those which are part of large MNC, which headquarters are in the countries with high legal requirement and where publishing CSR reports is strongly recommended or even required. Results of this research confirmed the results of previous research. Most companies in Serbia which published CSR reports were large companies, part of MNC, only 16.8% of medium companies published CSR reports, while small and micro companies did not publish any information about CSR. Special importance should be given to these companies, because they created more than 60% of total income, they employed 70% of total workforce and 99% of total number of companies in Serbia were SMEs in 2016 (Agencija za privredne registre, 2017). In order to engage in CSR activities, maybe a solution for these companies could be found in collaboration with other companies.

Results of this research confirmed the assumption that companies which published CSR reports had higher financial indicators than those which did not publish any reports. These results are consistent with some previous studies (Platonova et al., 2018, Cornett, Erhemjamts & Tehranian, 2016, Khan & Tariq, 2017, Pan et al., 2014, Skare & Golja, 2012, Vitezić, Vuko & Morec, 2012, Vitezić, 2011).

These research was limited to 100 companies which made the highest net profit in 2016 presented in the Top 100 report made by Business Registers Agency. Future research should include data from previous years, so changes could be followed during some period of time. Some more companies could appear in this list, so they could be added to the analysis.

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BENEFITS FROM IMPLEMENTING ENVIRONMENTAL MANAGEMENT ACCOUNTING: CASE OF TOSHIBA

Nastasja Stašević¹

Abstract: *We are witnesses that globalization helped to connect societies and their concern for the environment. Today environmental problems are not just problems of one country, they are global problems. Many environmental incidents have received full attention of worldwide media, which led to questioning many business practices. Nowadays ecological aspect of business cannot be ignored. Countries have developed new environmental laws to try to control these types of problems. Organizations in today's time must take into account the impact of their products and their actions on the environment. Good environmental policy can be used to make company brand. Conventional accounting has failed to identify environmental costs and these costs are in most cases neglected by the management. The main problem of environmental costs is that they are often invisible to the management because these costs are usually located as overhead costs under conventional accounting systems. Environmental Management Accounting can be a great tool for making these "invisible" costs visible to the shareholders.*

EMA essentially represent the combination of the best management and accounting thinking. It is used to overcome a limitation of conventional management with the purpose of better understanding environmental issues in the decision-making process. EMA provides both, financial and non-financial information, called PEMA and MEMA. One of the main goals of EMA is identification and allocation of costs which are connected with the environment. The purpose of EMA is to provide useful information about company's environmental costs and action. Nowadays many international companies use EMA techniques such as Mitsubishi Motors, Hitachi chemical, Canon, and Toshiba. Benefits of EMA can be reduced costs, improved reputation, innovation and many others. For Toshiba, the main benefit of using EMA was reduced environmental costs by 21% and their cost were reduced for 41.5 billion yen in 2016. Toshiba has implemented Environmental Management Information System trying to collect environmental data and to promote environmental issues. Toshiba Group calculates its environmental cost using Accounting Guidelines from 2005. This corporation has been publishing environmental reports since 1998.

The goal of this paper is to provide information on how Toshiba implemented EMA, techniques of EMA which they use and benefits they have received from using EMA through the years. The method which is used in this paper is a case study.

Keywords: *Environmental Management Accounting, Environmental costs, Environmental accounting, Toshiba.*

JEL Classification: *M 41*

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INTRODUCTION

Environmental management accounting is relatively new tool. It is actually focuses environmental aspect combined with accounting and management. EMA is answer to the conventional accounting which failed to deliver all information's about environmental costs. The main problem was that some of the environmental cost were invisible, meaning they are attributed to the general overhead accounts. Environmental management accounting makes this cost visible, so they can be considered in decision-making process. Traditional accounting usually focuses profit and do not pay attention to the environmental issues such as global warming. After many ecological catastrophes, this type of behaviour has been criticized and it led to "making" EMA.

EMA provides two types of information: monetary (MEMA) and physical (PEMA). MEMA expresses information in monetary units. By MEMA "addresses all the impacts that company related environmental impact have on its past, present and future financial stocks and flows." However, PEMA is defined as "physical environmental information's that include all past, present and future materials and energy amount that have an impact on ecological systems." (Bennet et al, 2005). PEMA provides intonations to internal management and it focuses on the strength and weakness of a particular ecological politic.

There are three groups of techniques of EMA:

1. Life cycle assessment, Activity-based costing (a tool used to calculate comprehensive costs), Material flow cost accounting (used in material and energy analysis). Life cycle assessment has been used to examine the impact of the product on environmental in all stages of the life cycle. Life cycle assessment focuses "the environmental impacts of a product or activity across its entire life cycle from raw materials until disposal." (Wahyun, 2009). The main purpose of the LCA is to discover weaknesses of the product and uses that information's to improve it. There are two types of LCA, fist focuses difficulties of burdens which are associated with the product and the second one is consequential which tries to discover a weakness.

Activity based costing is system which recognize the relationship between costs. It was designed in the 1980, as a consequence of the failure of the traditional accounting and poor decisions. In the ABC costs are assigned to activities not to the cost centres. (Leitner, 2004)

Material flow cost accounting is used to reduce at the same time, costs and environmental impact thought waste reduction. (Ingaldi & Klimecka, 2016)

2. Total cost analysis identifies "economic costs and areas of cost savings from pollution prevention". (Wahyun, 2009)

3. Balanced score card (Wahyun, 2009)

The first part of the paper focuses history of the Toshiba Company, second implementation, and benefits of usage Environmental Management accounting.

LITERATURE REVIEW

Environmental management accounting by Jasch is environmental accounting with the purpose of the better design-making process. Also, EMA is a tool which provides better use of the resources and it discovers methods for cost saving. (Jasch, 2015)

According to the IFAC (2015), there is no universally accepted definition of EMA. EMA analyze two types of information, physical and monetary. "EMA with its techniques in identifying, classification and analyzing operating costs (including environmental cost) can turn environmental information into monetary and physical shapes and improve firm's connection

with external resources information through reporting internal information and gaining external informations.“ (Saeidi, Sofian & Parvaneh, 2011)

IFAC states that benefits of EMA are in particular for internal management with specific focus such as green production.” EMA is a broad set of principles and approaches that provides the data essential to the success of many other environmental management activities.“ (IFAC, 2015). Environmental management accounting can be useful tool to help companies to avoid costs. (Bennet et al, 2005)

Management must be aware of the environmental costs, which are usually hidden, so companies are encouraged to accept environmental accounting as a respond to this problem (Saeidi, Sofian & Parvaneh, 2011)

By Burritt and Saka (2005), EMA is a tool that was designed “to trace and track environmental costs and physical environmental flows.”

Value of EMA was seen in the study of Xerox that Bennet and James in the 1998 carried out. Xerox has introduced the concept of the life cycle and only changing the package of their copier, the company cut costs and improved their relationship with costumers.

Xiaomei (2004) suggest that EMA can be defined as a tool, which collect, estimate, analyse environmental informations and costs.

By Bennett, Bouma, and Wolters (2002), the main use of EMA is “to support organisations environmental management“ (Bennett, Bouma & Wolters, 2002). Furthermore the value of EMA have seen many Korean companies which begin implementing EMA in 1990. The main reason for implementation was increasing costs. Moreover, EMA is a tool used to provide that enough attention has been paid to the environmental cost and to assure that all costs are considered in desigion making proces.“One of the objectives of EMA is to influence the desigions which have an impact on both the environmetal and financial performance of an organisaion.“ (Schaltegger et al., 2008). Physical information are very imortant because organisaion can track the flow of energy, water or waste. Jasch and Savage (2008) suggest that EMA sould not be a separate from Management accounting because EMA and MA share common goals (Schaltegger et al, 2008).

“EMA is MA with a focus on physical information on the flow of energy, water, products, and materials as well as monetary information on environmental costs and revenues and projects related to environmental protection. It is not a different method but simply doing better MA.“ (Jasch, 2015)

By the author, EMA can be defined as a combination of management knowledge, accounting practice, and environmental consciences. Combining an accounting way of thinking and managerial way of thing can lead to better plans, correct information and better results. Moreover, in the Toshiba case, the benefits of EMA are evident. In the 2000 Toshiba has gained the reputation of the green company, the company which cares for its environmental impact. This type of business is win-win business, saving nature company saves financial resources. EMA can be defined as managerial technology, which nowadays has been widely voluntary accepted. Voluntary acceptance is the result of benefits recognitions, making managers more committed. Nowadays in the author’s opinion, it is necessary to implement EMA in the SMEs, especially in developing countries.

METHODOLOGY

The focus of this paper is a case study of the Toshiba Company and their implementation of environmental management accounting. Toshiba’s environmental reports from 1998 to 2017 were analyzed in order to examine the benefits of implementing Environmental Management

accounting. Every environmental report was studied in order to examine the amount of the benefits in each year. Total benefits were analyzed.

The advantage of a case study is being able to focus just on Toshiba company and their environmental concerns which began in the last millennium by publishing Environmental Reports. The benefits of using EMA are the main problem of this study. Analyzing Toshiba, it was discovered that the company has divided total benefits into four aspects: assumed economic benefits, actual economic benefits, customer benefits and risk prevention benefits.

IMPLEMENTATION OF EMA IN TOSHIBA

History of the Company

In the 1875 Toshiba was founded as a company that should accommodate government's orders. After the great catastrophe in the 1932, company lost lot of employees in the earthquake. Nowadays Toshiba has been founded as a result of merger between Shiubaura Seisakusho and Tokyo Denki. In the 1940 company grow rapidly, by producing radios, vacuum tubes and others. Toshiba developed new technologies so the sales and profits grow and let to the establishment of the overseas subsidiaries. The name of Toshiba Corporation was established in the 1983. In the new millennium company has developed new technologies and ecological perspective.

Implementation of EMA Through the Years

The first environmental report was published in 1998. This report provides information about Toshiba environmental concerns. In the 1990 Toshiba set environment as one of the main goals. Also it adopts slogan: "Committed to People, Committed to the Future". In environmental reports Toshiba uses input-output analysis which provides information about energy, water, and other wastes. This type of analysis firstly provides input information in the physical unit such as energy or water usage and then at the end the output can be shown in the monetary units. In Toshiba, the analysis has been completed in physical units showing the amount of the waste and also showing the amount of the reduced and recycled water. In the report from 2005 it is shown that thousand of 9264 m² water was reused and thousands of 4933 m² of water was recycled.

Also, the report showed the increase of the energy conception. Moreover, Toshibas has been implementing the 30/35 Project which stands for reducing chemical substances. Toshibas concerns for environmental issues are shown in recycling initiatives. In the 1993 the company begins to implement the environmental accounting.

In the new millennium, Toshiba announced the plan to archive zero emission of waste. The environmental accounting calculates the benefits according to the Environmental Agency of Japan (2000). In the report from 2000. It has been saved 19.1 million of yens. The company implemented the terms "direct benefits" – reduced changes for water, electricity...) and "assumed benefits" – which stands for affect atmosphere, on water etc. The example of saving energy is that employees in Toshiba turn off their computers and other equipments in the time of lunch.

Moreover, Toshiba has gained ISO-14001 standard which stands for environmentally friendly systems. In the 2001, Toshiba added the term "costumer benefits" – which stands for "reduction of environmental impact using the products" (Toshiba, Environmental Report 2001). This means deceasing energy consumption.

One of the benefits of implementing EMA is a new way of environmental packages which decreased packages waste. In the 2002, Toshiba added new term "risk prevention benefits"- which stands for prevention of environmental risks. In the 2002 the company saved 36 613 million yens. Also, Toshiba has been introduced environmental education, meaning to improve environmental conscience. The company implemented Life cycle assessment towards

examination of products and their impact to the environment. Also, they used the Life cycle assessment to discover desirable functions of products.

As a proof that Toshibas has taken the environmental issues seriously, Environmental management has been positioned just under the CEO.

Toshiba was one of the first companies that use recycling. In the 2007, the company introduced eco-efficiency. The value of the eco-efficiency can be calculated as a ration of the value of the product and the environmental impact of the product. The environmental aspect of the product has been analyzed in the Life cycle assessment. Also, Toshiba has been implemented a unique indicator, T, for Toshiba, factor, which has focused on “the indication of the degree of improvement of eco-efficiency.” (Toshiba Environmental Report, 2005)

In the 2005 environmental cost increased by 4%, which is the consequence of the development of the new products. Toshiba strives to make products which have a minimal ecological impact. Moreover, environmental benefits have dropped for 18%.

One of the best examples of how Toshiba did a win-win business is e-blue toner. This toner reduce the usage of the paper, all of that was printed with this e-blue toner can be erased and the paper can be reused. With this development, Toshiba cut cost by 40% for the paper.

The company is also promoting an environmentally conscious product, using 3R Reduce, Reuse, and Recycle.

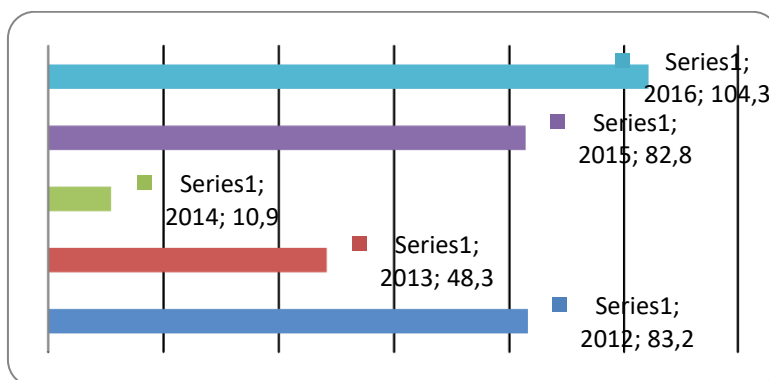


Figure 1: Total environmental benefits in bilions of yens, in Toshiba from 2012-2016
 Source: <https://www.toshiba.co.jp/env/en/communication/report/index.htm> (available 15.07.2018.)

In the 2009, Toshiba was reducing an environmental impact and the total benefit increased by 116 % in a comparison to the previous year. However, in the 2010 as a result of the producing expansion, the total benefit decreased foe 10%. The company collected about 150 000 tons of the end-life product and recycled about 115 000 tons. In the 2015, expansion of the Sigma Power Ariake Co. Led to the decreasing total benefits for 92%, but in the next year, the impact of the Sigma Power Ariake Co. was reduced.

In the last years repot, Toshibas environmental investments decreased by 26% in comparison to the 2015. Also, the sales of the energy saving products continued to rise and increased customer benefit by 69%. In the 2016 total monetary benefits were 104.338 millions of yens, which are showed in the picture 2.

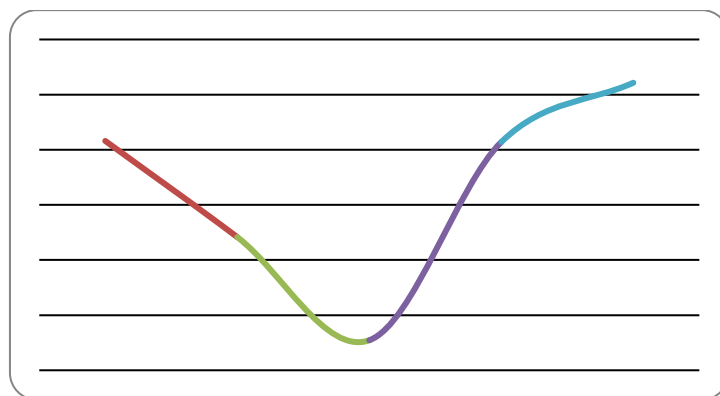


Figure 2: Movement of the total environmental benefits

Source: <https://www.toshiba.co.jp/env/en/communication/report/index.htm> (available 15.07.2018.)

CONCLUSIONS

EMA is a powerful tool, it combines reduction of the business environmental impacts and it also makes the environmental costs visible which in conventional accounting failed. Managers are usually unaware of the all environmental costs and could not reduce them. However, ignoring the environmental aspect of business can lead to increase of the costs, and more importantly negative environmental impact which can cause a bad reputation for the company. Nowadays, when the number of the big companies that implemented EMA has rose, leads to the question of implementation of EMA in the SMEs.

Toshiba, like others companies who have implemented Environmental point of view, and that caused numerous advantages. Firstly, the company have improved its reputation and received a good environmental rating. Also, Toshiba has been one of the first companies that introduced recycling life-end product, reducing its environmental impact. Just in 2011, Toshiba has recycled 119.000 tons of end-life household devices. The company has been implementing life cycle assessment as a tool, which is a self-critique tool and leads to improvement in all aspects of the product, especially ecological. Implementing EMA, in author's opinion, has been very positive in all aspects of business for Toshiba. Furthermore, implementing EMA has led to the increasing sale, especially for the product which were ecological and which implemented LCA. Moreover, the total benefit was millions of yens every year. However, in 2014 the Sigma Power Ariake Co. has caused negative environmental impact which was partly reduced in the 2015. In author's opinion it is almost certain that Toshiba will neutralize any negative environmental impact in the future.

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**APPLIED INFORMATICS
AND QUANTITATIVE METHODS**

MAXIMUM DRAWDOWN PROFILES OF VARIANCE AND VAR EFFICIENT PORTFOLIOS

Mikica Drenovak¹, Vladimir Ranković², Zoran Kalinić³

Abstract: When refer to efficient portfolios, investors still typically assume mean-variance efficiency of their portfolio. Yet, financial regulation, targeting banking industry and insurance companies, measure market risk and propose capital requirements in terms of Value-at-risk (VaR), as a downside measure of risk. Thus regulatory efficiency departs from efficiency typically assumed by investors. On the other hand, a fund manager who trades his client's money, a proprietary bank's trader, or a pension fund manager whose clients are guaranteed certain predetermined level of income in the future (those involved in defined benefit pension plans in particular), are all primarily concerned with drawdown and the potential of their portfolio to recover after decline. Portfolio drawdown is a downside risk measure which quantifies the amount by which portfolio declines from its highest level during specified period. Since drawdown is path dependent, it is critically important to investors to consider the evolution of their portfolio's value, and not just the terminal value. Regardless of how attractive are the expected characteristics of a fund, drawdowns are never desirable, no matter how short-lived and small they were, and may ruin the reputation of a fund and its managers. Even a temporary loss can cause the investor to liquidate his position reducing the base for management fees. This paper examines what are the Maximum Drawdown profiles of Variance and historical simulation VaR efficient portfolios. For empirical tests we use time series of MSCI Country indices and S&P 100 subsample of equities covering different countries and different market environments. We analyze different sub periods and provide portfolio summary statistics for different dates in order to comprehend risk profiles of targeted portfolios and to emphasize the impact of time series length to risk metrics. The main conclusion is that Variance and VaR optimization generally do not optimize portfolio drawdown. Therefore, portfolio Drawdown optimization cannot be achieved as "unintended consequence" of some other (downside or average) risk objective. In addition to determination of optimal Max Drawdown portfolio solutions it would be worthwhile to examine their risk profiles regarding other downside risk measures recognized by investors and regulators, such is VaR and CVaR (Conditional Value-at-risk).

Keywords: Downside risk measures, Drawdown, Value-at-risk, Portfolio optimization

JEL Classification: C61, G11, G32

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INTRODUCTION

Asset allocation is always characterized by several opposing goals. Typically, investors analyze trade-offs between risk and return and risk is still typically considered in terms of variance. Optimal portfolio allocation is among the most prominent issues in both academic research and real-world portfolio management. Since the seminal work of Markowitz (1952) mean-variance portfolio optimization is the cornerstone of modern portfolio theory. However, recent turmoil in financial markets emphasized the need for controlling the risk of extreme losses, the risk which cannot be properly accounted for by variance. Consequently, contemporary risk management practices and latest regulation brought to the fore downside risk measures, before all Value-at-risk (VaR).

Importantly, variance and VaR fail to capture an important aspect of risk—the impact of risk on the investor’s capital. By definition drawdown represents the percentage loss incurred by a portfolio from its historical high. For many investors control for drawdown of their portfolios is critically important. Capacity of a fund to save existing accounts and to attract new capital inflows will depend primarily on its track record and, in particular, on its ability to minimize losses. Regardless of how attractive are the expected characteristics of a fund, drawdowns are never desirable, no matter how short-lived and small they were, and may ruin the reputation of a fund and its managers. Even a temporary loss can cause the investor to liquidate his position reducing the base for management fees, often the only source of fund’s income.

In this paper, we examine maximum drawdown characteristics of minimum variance and minimum VaR portfolios. We follow Markowitz’s setup in choosing minimum variance portfolio. For VaR calculation we apply historical simulation model (see Pritsker, 2006 for more on historical VaR). Historical simulation VaR optimization is computationally very complex and there is no analytical solution to the problem. In order to determine minimum VaR portfolios we use genetic algorithm as in Ranković et al. (2014). Minimum variance and minimum VaR portfolios are determined using the actual portfolio approach (See Rankovic et al., 2016 for more on implications of Actual portfolio approach to portfolio optimization). Actual portfolio approach is based on the assumption of fixed portfolio holdings during the observed period. It reflects buy-and-hold portfolio strategy (no rebalancing over the observed period) and therefore is appropriate for analyzing historical performance of current portfolio. The results and conclusions correspond to two opportunity sets: one consisting of Developed Countries MSCI total return indexes, another comprised of subset of S&P 100 index constituents. The remainder of this paper is organized as follows. In Section 2, the Drawdown and Maximum Drawdown risk measures are formally introduced. Section 3 provides data description and the empirical results. Our conclusions and suggestions for future research are given in Section 4.

DRAWDOWN AND MAXIMUM DRAWDOWN

Drawdown (DD) is a risk measure which reflects a loss from a high point (definitions and denotation are taken from: Active asset allocation, 2016). Formally:

$$DD(t) = \frac{P_t}{\max(P_0 : P_t)} - 1$$

where P_0 and P_t are the portfolio values at time 0 (first observed price) and at time t .

By definition Maximum Drawdown (MDD) is “the loss that an investor would suffer if he bought a portfolio at its highest price and then sold it at its lowest price”. In other words, MDD is the lowest value of the realized drawdowns over a given period. Formally:

$$MDD(0,T) = \min_{t \in (0,T)} DD(t)$$

These are the most important properties of Maximum Drawdown:

- a. The shorter the time period between two dates for measuring portfolio's value, the greater is the maximum drawdown: A maximum drawdown calculated on daily data will be equal to or greater than the maximum drawdown calculated on weekly (or monthly) data.
- b. The longer the observed period, the greater is the maximum drawdown.
- c. Drawdowns are subject to "base effect" which stems from the mathematical properties of percentage calculus: The greater the loss a portfolio incurs the greater is the "base effect". That is, the percentage change of recovery is always greater than the percentage loss since the base decreases. For example, to fully recover his capital from a 30% loss, one needs a 42.8% gain.

Since drawdown is "path dependent", it is critically important to investors to consider the evolution of their portfolio's value, and not just the terminal value. Variance, on the other hand, provides no insight about the direction of returns and "ignores" sequences of negative returns which lead to significant losses.

Significance of drawdown as a risk metric is also confirmed by several academic studies which considered portfolio optimization with drawdown constraints Cvitanic and Karatzas, 1995; Grossman and Zhou, 1993). In particular, see Chekhlov et al. (2005) for an attempt to solve for optimal solutions of asset allocation with MDD constraint applying LP programming to portfolio with fixed weights.

DATA AND RESEARCH RESULTS

For the purpose of the research two opportunity sets are employed: 1) Opportunity set consisted of 24 Developed Countries MSCI total return indexes as of March 2016 and 2) Opportunity set consisted of 36 constituents of S&P 100 index included in the index as of March 2016, for the period January 5th 2004-March 15th, 2012. Source of data is Datastream Thomson Reuters. Both sets include historical daily prices.

We determine minimum 1% VaR/5% VaR and minimum variance portfolios using three different historical periods: 500, 750 and 1000 days. We chose two optimization dates November 5th, 2007 and March 15th, 2012. First date captures events prior to financial crisis (ending 1 year before) while second date corresponds to the period upon the outbreak of the crisis. More particularly, second date is chosen so that only the longest employed historical period (of 1000 occurrences) includes the bottom in prices. In total we analyze 36 optimal portfolios. The motivation is to provide robustness for our conclusions since the values of variance (standard deviation) and historical simulation VaR on one side and Drawdown on the other are sensitive to the length of underlying time series (See Alexander, 2008 and Christoffersen, 2012 for more details on VaR sensitivity). We analyze different sub periods and provide portfolio summary statistics for different dates in order to comprehend risk profiles of targeted portfolios in different market environments and to emphasize the impact of time series length to risk metrics.

Figure 1 depicts evolution of MSCI World index and its corresponding Drawdown for the observed period.⁴ Tables 2 and 3 provide the summary statistics for chosen portfolios.

The maximum drawdown for the MSCI index is observed for March 9th, 2009 and is equal to 57.5%. In other words the index lost more than half of its value from its previous peak. One can also observe the impact of base effect. It took more than four years (and the staggering 135% increase) before the index recovered to its previous high.

⁴ For the reasons of clarity we do not present S&P 500 index and its drawdown evolution.

If considering the results given in Tables 1 and 2 the most important conclusion is: Variance and VaR optimization do not optimize Max Drawdown. One would expect the increase of MDD with the increase in time horizon. However, 1% VaR 750 day strategy for MSCI sample results in greater MDD than 1% VaR 1000 MDD in 2007 (the same is for S&P sample). For 5% VaR strategy for MSCI sample in 2007 the highest is 500 day MDD. The list of such examples is not exhaustive. The 2012 year sample is specific since only the 1000 length series include high pre-crisis levels of underlying indices. So the highest 2012 MDDs always correspond to 1000 days subsamples regardless of the optimization strategy (The same conclusion applies for the benchmark MDDs.).

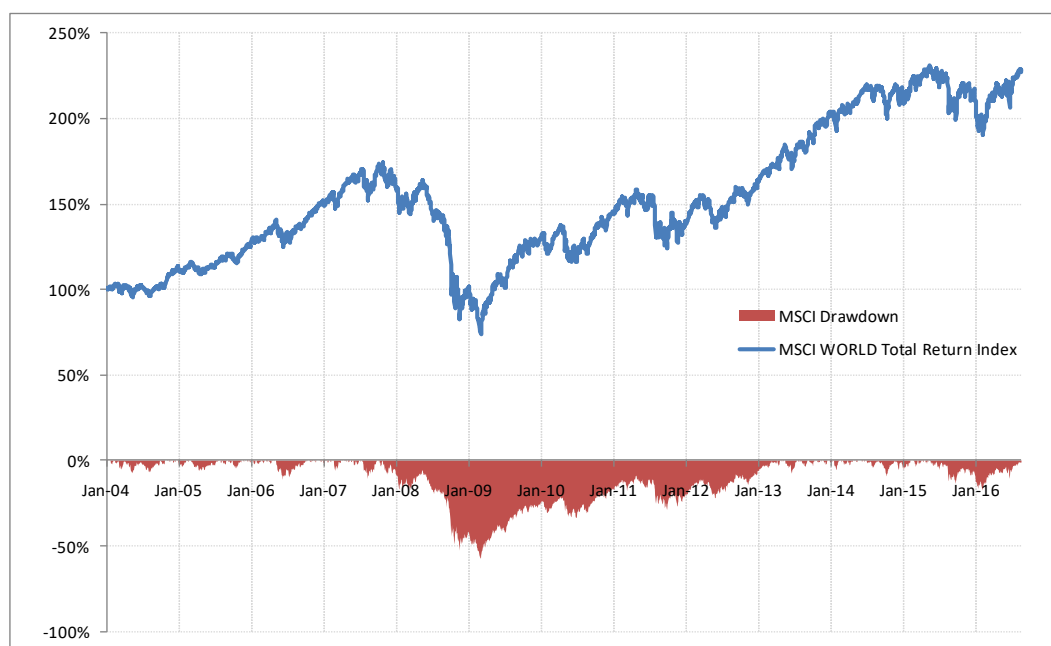


Figure 1: Evolution of MSCI World Total return index and its Drawdown January 5th, 2004-August 25th, 2016; Initial value of MSCI index is normalized to 1 (100%)

Source: Authors

In fact it seems that Variance or VaR optimization may not decrease MDD at all. MDDs of MSCI benchmark are similar or lower compared to MDDs of optimal portfolios. The only exception is MDD for 1000 length MSCI sample in 2012 which is significantly larger compared to MDDs of optimal portfolios.⁵

Second, perhaps surprisingly, VaR optimization does not provide superior MDD performance compared to Min Variance portfolio strategy. Variance strategy for MSCI sample, regardless of the observed period, results in lower MDD compared to corresponding 1% VaR MDD in 2007. The same is true for 750 day Variance strategy for S&P sample in 2007.

⁵ Benchmark MDDs for S&P sample are larger compared to MDDs of optimal portfolios but these results should be taken with caution since our sample includes only 36 assets of underlying benchmark.

Table 1. Summary statistics for MSCI opportunity set, Min Variance and Min VaR portfolios, based on time series of 500, 750, and 1000 days, on November 5th, 2007 and March 15th, 2012; Benchmark Max Drawdown refers to Max Drawdown of benchmark MSCI World index for 2 dates and three different historical periods (500, 750, and 1000 days).

MSCI World Sample	Average Return*	Standard Deviation*	Sharpe	Sortino	Max DrawDown	Skewness	Kurtosis	Benchmark Max DrawDown
1%VaR t=500 5-11-2007	21.96%	9.70%	0.14	0.14	-11.23%	-0.46	1.62	-11.21%
5%VaR t=500 5-11-2007	16.69%	9.52%	0.11	0.11	-13.95%	-0.79	2.67	
STDEV t=500 5-11-2007	15.00%	8.94%	0.11	0.11	-11.16%	-0.60	1.55	
1%VaR t=500 15-3-2012	9.18%	15.13%	0.04	0.04	-23.12%	-0.31	1.88	-21.78%
5%VaR t=500 15-3-2012	-0.23%	14.07%	0.00	0.00	-21.86%	-0.52	2.49	
STDEV t=500 15-3-2012	4.03%	13.59%	0.02	0.02	-19.69%	-0.47	2.07	
1%VaR t=750 5-11-2007	14.37%	9.43%	0.10	0.10	-12.62%	-0.15	0.95	-11.21%
5%VaR t=750 5-11-2007	15.30%	9.16%	0.11	0.10	-10.18%	-0.35	1.66	
STDEV t=750 5-11-2007	14.17%	8.33%	0.11	0.11	-11.10%	-0.46	1.56	
1%VaR t=750 15-3-2012	11.10%	16.55%	0.04	0.04	-21.00%	-0.39	3.96	-21.78%
5%VaR t=750 15-3-2012	11.97%	13.31%	0.06	0.06	-20.93%	-0.47	2.48	
STDEV t=750 15-3-2012	13.41%	13.00%	0.06	0.06	-20.26%	-0.47	2.12	
1%VaR t=1000 5-11-2007	11.89%	9.15%	0.08	0.08	-12.19%	-0.30	0.84	-11.21%
5%VaR t=1000 5-11-2007	13.36%	8.55%	0.10	0.10	-11.67%	-0.54	1.68	
STDEV t=1000 5-11-2007	14.01%	8.46%	0.10	0.10	-11.22%	-0.49	1.64	
1%VaR t=1000 15-3-2012	-1.16%	16.94%	0.00	0.00	-43.48%	-0.41	3.49	-54.90%
5%VaR t=1000 15-3-2012	-0.89%	17.15%	0.00	0.00	-46.34%	-0.37	4.13	
STDEV t=1000 15-3-2012	-0.77%	16.88%	0.00	0.00	-43.99%	-0.40	3.77	

*annualized

Table 2 Summary statistics for S&P 100 opportunity set, Min Variance and Min VaR portfolios, based on time series of 500, 750, and 1000 days, on November 5th, 2007 and March 15th, 2012; Benchmark Drawdown refers to Max Drawdown of benchmark S&P 100 index for 2 dates and three different historical periods (500, 750, and 1000 days).

S&P 100 36 Assets Sample	Average Return*	Standard Deviation*	Sharpe	Sortino	Max DrawDown	Skewness	Kurtosis	Benchmark Max DrawDown
1%VaR t=500 5-11-2007	16.41%	9.29%	0.11	0.11	-4.88%	-0.07	2.14	-8.48%
5%VaR t=500 5-11-2007	11.44%	9.06%	0.08	0.08	-6.23%	-0.04	2.72	
STDEV t=500 5-11-2007	11.55%	8.71%	0.08	0.08	-5.61%	-0.22	2.43	
1%VaR t=500 15-3-2012	18.40%	13.58%	0.09	0.09	-8.05%	-0.03	2.78	-16.98%
5%VaR t=500 15-3-2012	14.36%	12.02%	0.08	0.08	-8.32%	-0.23	3.05	
STDEV t=500 15-3-2012	10.86%	11.76%	0.06	0.06	-9.90%	-0.24	3.22	
1%VaR t=750 5-11-2007	11.09%	9.25%	0.08	0.08	-6.57%	-0.02	1.36	-8.48%
5%VaR t=750 5-11-2007	9.49%	9.09%	0.07	0.07	-6.62%	0.07	1.36	
STDEV t=750 5-11-2007	9.20%	8.72%	0.07	0.07	-5.76%	-0.18	1.83	
1%VaR t=750 15-3-2012	17.85%	12.39%	0.09	0.09	-8.18%	-0.02	2.43	-16.98%
5%VaR t=750 15-3-2012	16.06%	11.52%	0.09	0.09	-8.69%	-0.16	3.00	
STDEV t=750 15-3-2012	16.14%	11.22%	0.09	0.09	-9.74%	-0.35	3.30	
1%VaR t=1000 5-11-2007	13.22%	9.52%	0.09	0.09	-5.34%	-0.07	1.79	-8.48%
5%VaR t=1000 5-11-2007	10.20%	9.23%	0.07	0.07	-6.31%	-0.05	1.48	
STDEV t=1000 5-11-2007	8.74%	8.87%	0.06	0.06	-7.68%	-0.18	1.40	
1%VaR t=1000 15-3-2012	6.80%	18.92%	0.02	0.02	-31.68%	0.72	11.92	-49.44%
5%VaR t=1000 15-3-2012	9.62%	17.77%	0.03	0.03	-26.29%	0.71	14.78	
STDEV t=1000 15-3-2012	8.49%	17.41%	0.03	0.03	-28.23%	0.58	13.61	

*annualized

CONCLUSIONS

Unlike many other risk metrics, drawdown directly reflects the impact of risk on investor's capital. Control of portfolio drawdown has always been one of the greatest concerns for investors and fund managers alike. In this research we applied Variance and historical simulation VaR portfolio optimization with the aim to examine the Drawdown profiles of optimal portfolios. Although VaR and Max Drawdown are both classified as downside risk metrics the latter is path dependent and, as we show in this research, neither Variance nor VaR optimization lead to (near) optimal Max Drawdown portfolio solutions. Therefore, optimal MDD portfolio cannot be obtained as an "unintended consequence" of achieving some other risk optimization objective. It needs special treatment but it still does not attract the attention it deserves. In addition to determination of optimal Max Drawdown portfolio solutions it would be worthwhile to examine their risk profiles regarding other downside risk measures recognized by investors and regulators, such is VaR and CVaR (Conditional Value-at-risk).

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SEM-ANN RESEARCH OF TAM EXTERNAL ORGANIZATION FACTORS' IMPACT ON ERP ACCEPTANCE BY EMPLOYEES

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Abstract: *The success of an enterprise depends on both, people and technology, but one of the very important aspects is how do people i.e. employee perceive and accept new technological advancements in their working environment. Modern companies nowadays, depending on size and type of business, use many different types of information systems but one of the most common are enterprise resource planning (ERP) systems. ERP systems are systems that typically consist of an enterprise-wide set of management tools that empowers business functions in organization in way to enable employees to conduct their work better. This paper studies the influence of external organization factors' such as social influence, business process fit, training and education and communication on attitude toward using ERP systems. The research model and the hypothesized relationships are based on the technology acceptance model (TAM), which is one of the most famous and frequently used model of technology adoption. Therefore, the study examines the influence of aforementioned external organization factors on perceived usefulness and ease of use as mediators toward employees' attitude toward ERP systems. Majority of researches on ERP acceptance have been conducted with structural equation modelling (SEM) based research approaches. In this paper, a two-step approach will be used with the purpose to determine which factors have statistically significant influence on attitude toward using ERP systems. The purpose of this paper is to extend basic TAM research that is traditionally based on SEM technique with artificial neural network (ANN) approach. In the first step of the present research, the SEM technique was used to determine which factors have statistically significant influence on attitude toward using ERP systems; in the second step, ANN models will be used to rank the relative influence of significant predictors obtained from SEM. As a basic ANN model, multi-layer perceptron with feedforward back-propagation training algorithm was used. The use of suggested multi-analytical approach i.e. combination of SEM and ANN models provides two important benefits. First, it enables additional verification of the results obtained by the SEM analysis. Second, this approach enables capturing linear but also complex nonlinear relationships between antecedents and dependent variables and more precise measure of relative influence of each predictor.*

Keywords: ERP acceptance, neural networks, employees, SEM, PLS, ANN

JEL Classification: M15, L62, O32, O33

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INTRODUCTION

Acceptance of information technologies (IT) and information systems (IS) has been researched for long time and researchers used several theoretical models to investigate the determinants of acceptance and use of new IT. Compared to competing models, the theory of the technology acceptance model (TAM; Davis et al., 1989) is believed to be more parsimonious, predicative, and robust (Venkatesh and Davis, 2000), and so among the theoretical models it is most widely used by IS/IT researchers (Davis, 1989; Davis et al., 1989; Amoako-Gyampah and Salam, 2004; Lee et al., 2010). The key purpose of TAM is to provide a basis for tracing the impact of external factors on internal beliefs, attitudes, and intentions (Davis et al., 1989). The basic TAM is well established and tested and furthermore, a variety of extensions regarding external factors by examining the antecedents of perceived usefulness (PU) and perceived ease of use (PEOU) has been developed. Also extensions of TAM have been proposed: TAM2 by Venkatesh and Davis (2000), a model of the determinants of PEOU by Venkatesh and Davis (2000) and TAM 3 by Venkatesh and Bala (2008).

ERP systems are systems that typically consist of an enterprise-wide set of management tools that empowers business functions in organization in way to enable people (employees) to conduct their work better. Organizations turn to ERP systems to improve efficiency and become more responsive. As several studies (i.e. Umble et al., 2002; Nah et al., 2004) have revealed, a common reason for ERP failures can be attributed to users' reluctance and unwillingness to adopt and to use the implemented ERP system. TAM was also very often used for researching ERP acceptance in organizations. A literature review of past ERP studies using TAM indicates that different studies have investigated ERP user acceptance and usage. They have researched different issues of ERP use and have been focused on small (limited) number of determinants (external factors) or cognitive factors which could have influence on ERP acceptance and usage in different phases of the ERP system lifecycle (Nah et al. 2004, Amoako-Gyampah and Salam 2004, Bueno and Salmeron 2008, Calisir et al. 2009, Lee et al. 2010, Sternad et al. 2011, Sternad and Bobek 2013, 2014).

Majority of research on ERP acceptance has been conducted with structural equation modelling (SEM) based research approaches. With the increasing complexity of the ERP acceptance theoretical model (e.g. non-linear relations between variables), the need for new SEM techniques that could address this issue arises; similar research objectives are appearing in other research fields, as well (Hsu et al., 2006). The two-step approach of Artificial Neural Network (ANN) - SEM technique could be superior to traditional SEM techniques since it can measure non-linear relations by using different activation functions and layers of hidden nodes, and it might assess structural equations estimations even if not all the assumptions of the model are satisfied (Hackle and Westlund, 2000). So, ANN research approaches are appearing which can be useful for such research attempts.

The purpose of this paper is therefore to extend the research of the ERP acceptance TAM-based research, which is traditionally conducted by the SEM technique, with the ANN approach. The research is based on a survey data that has been collected from a multinational manufacturing company, which uses ERP for 15 years. The rest of this paper is organized as follows: literature review, methodology, results and discussion and conclusions and recommendations, where the added value of the usage of combined SEM and ANN approach is assessed.

LITERATURE REVIEW

The SEM technique allows for a set of complex relationships between one or more independent variables and one or more dependent variables that can be either factors or measured variables. SEM is a confirmatory technique where the first step in the analysis is the specification of the

model. The model is estimated, evaluated and perhaps modified – therefore the goal of SEM may be to test the model, to test specific hypotheses about the model, to modify an existing model or to test a set of related models (Tabachnick and Fidell 2013). There are two types of SEM techniques – covariance-based (e.g. LISREL, EQS or AMOS) and component-based SEM techniques (e.g. PLS - Partial Least Square). With the growing importance of a TAM model, we must determine which SEM technique can better measure a TAM model. Covariance-based SEM techniques estimate paths coefficients and loadings by minimizing the difference between observed and predicted variance-covariance matrices (Hsu et al. 2006). PLS estimates parameters like the principal components with a multiple regression approach. Method of the component-based SEM specification is the Bentler-Weeks method (Tabachnick and Fidell 2013).

Although SEM is well-known and well-established statistical modeling technique, it has a limitation: as a linear technique, SEM is very good for testing relationships among variables only if these relationships are linear. SEM linear nature may sometimes lead to the over-simplification of the complex problems like human decision processes, including technology adoption decisions (Chan and Chong 2012; Tan et al. 2014). One of the possible solutions for this problem is the introduction of complementary technique, capable of modeling non-linear relationships among variables – artificial neural networks (ANNs). ANNs is one of the most famous techniques of artificial intelligence (Negnevitsky 2011), as the ANN architecture is based on the human brain structure. ANN models have several advantages: they are able to model complex linear and non-linear relations between their inputs and outputs (Chan and Chong 2012), these models are more robust, with higher prediction accuracy (Sim et al. 2014), less sensitive to noisy samples (Hew et al. 2016) and they require no multivariate assumptions such as normality, linearity or homoscedasticity to be fulfilled (Priyadarshinee et al. 2017). More details on ANN design may be found in Liébana-Cabanillas et al. (2017).

This two-step approach, i.e. combination of SEM and ANN was already successfully implemented in the technology adoption studies, like mobile commerce (Yadav et al. 2016), Facebook usage (Sharma et al. 2016), mobile payments (Ooi and Tan 2016), cloud computing (Priyadarshinee et al. 2017), social CRM (Ahani et al., 2017), mobile learning (Tan et al. 2014), etc. Due to its “black-box” nature, ANN is not suitable for hypotheses testing (Priyadarshinee et al. 2017). That is why we follow the well-established procedure: SEM is used to identify significant predictors of dependent variables, while ANN is used to the rank of influence of significant predictors obtained by SEM (Liébana-Cabanillas et al. 2018; Ooi and Tan 2016).

METHODOLOGY

The approach based on TAM model was used. The constructs of the proposed model for acceptance of ERP systems by users, based on original TAM, are: perceived ERP usefulness (PU), perceived ERP ease of use (PEOU) and attitude toward ERP use (AT) of original TAM. The external constructs were included into the model as well. The constructs of organisational process external variables are based on the ERP acceptance model (ERPAM) developed by Sternad et al. (2011) and include: social influence, business processes fit, training and education, support and communication. The research ERP acceptance model includes 8 factors and is presented by Figure 1. All the items of constructs were measured on a 7-point Likert scale, ranging from 'strongly disagree' to 'strongly agree'. In addition, demographic information has been collected.

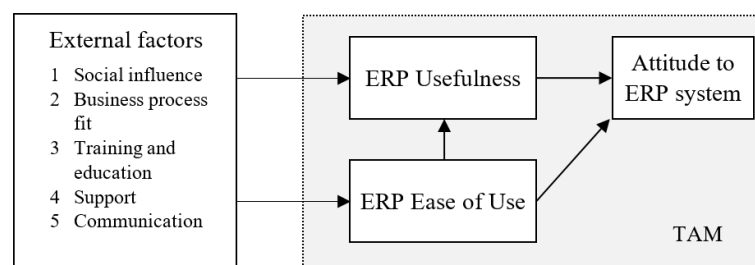


Figure 1: Conceptual Research Model

Source: Authors

The main focus of our research is to test hypothesis: The two-step SEM and ANN approach enables better in-depth research results as compared to the single-step SEM approach.

The research is based on a survey that included 208 respondents from a multinational manufacturing company, which has subsidiaries in four countries and employs around 4000 employees. The company uses ERP system for 15 years. Because subsidiaries are in different European countries, questionnaire was translated into Slovenian, Croatian, Bosnian and Serbian language. Prior to the distribution of web questionnaire, the preliminary testing was conducted. After that, a total of 860 ERP users in the company received the e-mail with invitation and link to web questionnaire; further review and exclusion of incomplete questionnaires led to 208 valid elements (respondents) that were included in the further analysis (24.19 %).

In the first stage of our research, SEM technique was used to determine which factors have statistically significant influence on AT. In this stage the empirical data was analysed in two steps involving PLS technique, using SmartPLS 3 (Ringle et al., 2015). In the first step outer (measurement) model was assessed. Second step was focused on hypothesis testing. In the second stage, ANN models were used to rank the relative influence of significant predictors obtained from SEM. In this study three ANN models were formed, according to the three constructs of the extended TAM, therefore, the perceived ERP usefulness (PU), perceived ERP ease of use (PEOU) and attitude toward ERP use (AT) represent outputs in three ANN models.

RESULTS AND DISCUSSION

208 questionnaires were properly filled and used for the purpose of analysis. Responders are from different countries: 141 (67.79 %) from Slovenia, 48 (23.08 %) from Croatia, 16 (7.69 %) from Bosnia and Herzegovina and 3 (1.44 %) from Republic of Serbia. They were 27.4 % (57) female and 72.6 % (151) male. Most of them 65.4 % (136) had finished higher school or more. Descriptive statistics of respondents' characteristics is shown in Table 1. They used ERP systems approximately 3 hours per day. 59.1 % (123) had working positions classified as worker (experts and other employees), 29.3 % (61) as low management (e.g. manager of group or organization unit), 20.6 % (22) as middle management (e.g. CIO) and 1 % (2) had working positions classified as corporate government and/or top management. Average total working years is 16.1 years (min = 1, max = 40) and average working years on the same working positions is 8.1 years (min = 0, max = 36).

Measurement model of the scales was assessed via evaluation of reliability, convergent validity and discriminant validity. The external factors that did not meet assessment requirements of the measurement model, were excluded from further analysis; these factors are support and communication. The research results for the final version of the model, including all together six constructs, are presented. Measures of reliability: Composite reliability (CR) and Cronbach's alpha (α) and convergent validity are shown in Table 2. Discriminant validity between constructs

was assessed following Fornell and Larcker's (1981). All measurement loadings are larger than 0.70, which represent well-fitting reflective model (Hensleler et al., 2016) and cross-loadings are smaller. The results can be obtained from the authors.

Table 1: Sample structure regarding respondents' demographic characteristics

Measure	Frequency	%
Gender		
Female	57	27.4
Male	151	72.6
Age		
20-29	16	7.7
30-39	62	29.8
40-49	74	35.6
50-59	54	26.0
>60	2	1.0
Education level		
Secondary school or less	72	34.7
Higher school or university	124	59.6
Master's degree or more	12	5.8

Source: Authors

Table 2: Psychometric properties of the instrument (n = 208)

Construct	Indicators	Mean SD	Loadings	Cronbach's α	CR	AVE	R^2
Training and education	TE1	2.95 1.73	0.91	0.64	0.85	0.73	
	TE2	3.06 1.78	0.79				
Social influence	SI1	4.86 1.46	0.93	0.85	0.91	0.77	
	SI2	4.88 1.41	0.95				
	SI3	5.01 1.33	0.74				
Business Processes Fit	BPF1	5.00 1.56	0.80	0.81	0.88	0.64	
	BPF2	5.02 1.58	0.65				
	BPF3	4.82 1.50	0.87				
	BPF4	4.91 1.54	0.86				
PEOU	PEOU1	4.76 1.51	0.93	0.97	0.98	0.92	0.42
	PEOU2	4.70 1.56	0.98				
	PEOU3	4.74 1.56	0.97				
	PEOU4	4.67 1.53	0.95				
PU	PU1	4.61 1.49	0.95	0.90	0.95	0.91	0.52
	PU2	4.49 1.48	0.95				
AT	AT1	5.74 1.21	0.89	0.82	0.91	0.73	0.47
	AT2	5.21 1.45	0.95				

Source: Authors

Overall, the measurement results are satisfactory and suggest that it is appropriate to proceed with the evaluation of the structural model. Paths are interpreted as standardised beta weights in a regression analysis. The relationships testing results are based on bootstrapping (with 500 subsamples) to test the statistical significance of each path coefficient using t-tests, as recommended by Chin (1998). Results of analysis for extended TAM model are shown in Figure 2 (only significant path coefficients associated with external factors are presented). PEOU has

the significant effect on PU ($\beta = 0.48, p < 0.05$) and significant effect on AT ($\beta = 0.45, p < 0.01$). PU has significant effect on AT ($\beta = 0.29, p < 0.01$). All relationships among constructs based on the original TAM are positive, as expected.

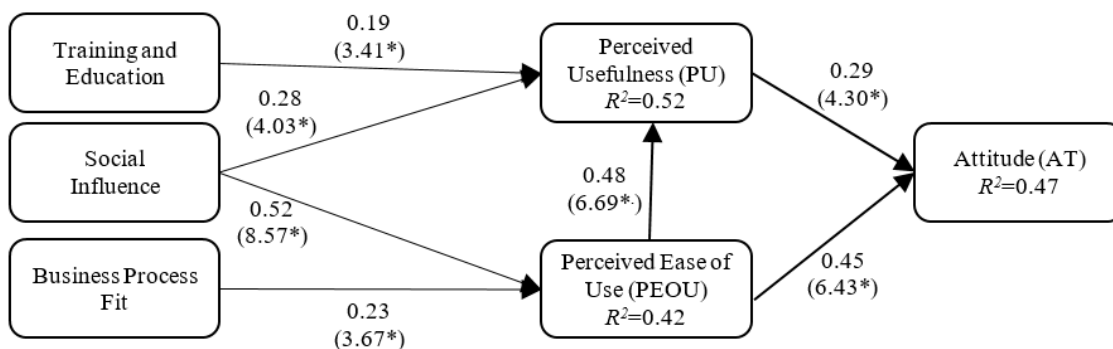


Figure 2: Results of structural model analysis

Note: *Path significance: * $p < 0.01$

Source: Authors

There are also several significant relationships among external factors and antecedents of attitudes (AT). Factor Business Process Fit has positive significant effect PEOU ($\beta = 0.23, p < 0.01$). Factor Social Influence has positive significant effect on PEOU ($\beta = 0.52, p < 0.01$) and on PU ($\beta = 0.28, p < 0.01$). Factor Training and Education has weak positive effect on PU ($\beta = 0.19, p < 0.01$). Furthermore, we have checked also all other relationships between external factors on PEOU, PU and AT, but none of the relationships was significant.

Second stage – ANN

Based on the research model presented in Figure 2 and SEM results, three sub-models for the ANN analysis were created: Model A has three inputs: TE, SI and PEOU, obtained by SEM as significant predictors of PU, which in this model represents an output. Models B and C both have two inputs (Model B: SI and BPF and Model C: PU and PEOU) and one output (PEOU for Model B and AT for Model C). Although there are several types of ANN models in use, here we employed one of the most common - multi-layer perceptron with feedforward back-propagation algorithm (Liebana-Cabanillas et al., 2017). All simulations were performed in SPSS 20. Each ANN model consists of layers: one input, one or more hidden and one output layers. The number of neurons in input and output layers is determined by the problem structure i.e. it corresponds to the number of predictors and dependent variables. ANN models in technology adoption studies usually have one hidden layer, with the number of neurons determined by trial-and-error, rule-of-thumb or automatically by simulation software (Liebana-Cabanillas et al., 2017). In our study, the number of hidden neurons was determined by simulation software, and it was two for all three models. Sigmoid is used as an activation function in both, hidden and output layers (Hew et al., 2016; Liébana-Cabanillas et al., 2018). Finally, for better model performances, all input and output variables were normalized to the range [0, 1] (Liébana-Cabanillas et al., 2017; Negnevitsky, 2011).

To avoid over-fitting, ten-fold cross validation procedure was performed, with 90%:10% ratio between training and testing data (Ooi and Tan, 2016; Tan et al., 2014). The quality of ANN model and its accuracy is usually measured by Root Mean Square of Error (RMSE) (Liébana-Cabanillas et al., 2017; Sharma et al., 2016). The average values of RMSEs of all three models, for ten runs and both training and testing data sets, were in range 0.1014-0.1309, and these small values imply that ANN models are quite reliable in capturing the relationships between determinants and dependent variables (Ooi and Tan, 2016; Tan et al., 2014).

Sensitivity analysis uses normalized importance of each input as the ratio of the relative importance of each input with the highest relative importance to measure and rank the influence of each predictor on the output variable (Sharma et al. 2016; Yadav et al. 2016), and the results are presented in Table 3.

Table 3: Neural network sensitivity analysis

Network	Model A Relative importance			Model B Relative importance		Model C Relative importance	
	TE	SI	PEOU	SI	BPF	PU	PEOU
1	0.207	0.339	0.454	0.704	0.296	0.479	0.521
2	0.195	0.344	0.461	0.672	0.328	0.474	0.526
3	0.129	0.361	0.509	0.651	0.349	0.483	0.517
4	0.163	0.384	0.453	0.611	0.389	0.398	0.602
5	0.187	0.367	0.447	0.656	0.344	0.474	0.526
6	0.153	0.340	0.507	0.719	0.281	0.424	0.576
7	0.166	0.336	0.498	0.732	0.268	0.432	0.568
8	0.182	0.370	0.447	0.689	0.311	0.404	0.596
9	0.179	0.344	0.477	0.755	0.245	0.428	0.572
10	0.177	0.334	0.489	0.708	0.292	0.406	0.594
Average importance	0.174	0.352	0.474	0.690	0.310	0.440	0.560
Normalized importance (%)	36.9	74.5	100.0	100.0	45.5	79.2	100.0

Note: TE = Training and Education; SI = Social influence; PEOU = Perceived ease of use; PU = Perceived usefulness; BPF = Business processes fit; AT = Attitude.

Source: Authors

ANN Model A also predicts PEOU as the most significant determinant of PU, but it finds much stronger influence of SI than TE on PU, compared to SEM findings. The results of SEM and ANN for Model B are almost the same, while in the case of Model C ANN results show a bit stronger influence of PU than obtained by SEM.

The main hypothesis of this research was, that the two-step SEM and ANN approach enables better in-depth research results as compared to the single-step SEM approach. Since additional results regarding the relative importance of the input variables are obtained, that represents important information for organizations when planning, implementing and upgrading ERP systems, hypothesis is confirmed.

CONCLUSIONS AND RECOMMENDATIONS

In general, a covariance-based SEM technique such as LISREL, AMOS and EQS requires a relatively larger sample than a component-based SEM technique such as PLS, which is important factor when we research technological acceptance inside the organization. The advantages of component-based SEM technique are small sample size, less requirement to sample distribution and fewer convergence problems (Henseler et al. 2009). The disadvantages are: direct statistical tests are not available and results are often biased (Chin 1998). In research settings with predictive scope, weak theory, and no need for an understanding of underlying relationships, artificial neural networks (ANN) may be useful (Henseler et al. 2009). Since SEM is only able to examine linear relationships, it may sometimes oversimplify the complexities involved in the human decision-making processes (Leong et al. 2015). To solve this issue, ANN is incorporated in identifying the non-compensatory and non-linear relationships in the research model as it is capable to learn complex linear and non-linear relationships. Besides that, ANN can produce more accurate predictions compared to the traditional regression techniques such as SEM,

logistic, multiple and discriminant regression (Leong et al. 2015), because ANN is an artificial intelligence tool that has outperformed these models as it has the ability to detect both linear and nonlinear relationships with high predictive accuracy (Leong et al. 2015). But ANN is not suitable for causal relationship hypothesis testing due to its “black-box” operating nature and since linear models (e.g. SEM) have the possibilities of over-simplifying the complexities in decision making processes (Sim et al. 2014). Because of that, the use of SEM – ANN approach in this study was complement each other. The significant determinants from the SEM analysis were employed as the input variables for the ANN analysis.

The results of the research support all the proposed relationships in the structural model (Figure 1) which are relationships proposed in model TAM by Davis (1989) and Davis et al. (1989). PEOU has stronger positive effect on AT than on PU. PEOU has also strong positive effect on PU. The results of the current study support prior research finding regarding the relationship between PEOU and AT (see Nah et al., 2004; Bueno and Salmeron 2008) and the link between PU and AT (Amoako-Gyampah and Salam, 2004; Nah et al., 2004; Bueno and Salmeron, 2008; Calisir et al., 2009). Main question of every organization should be how to extend the usage of their ERP system. As Davis et al. (1989) expose the key purpose of TAM is to provide a basis for tracing impact of external factors on internal beliefs etc. Based on the results of extended TAM, this study found that it is possible to identify several external factors. We exposed five external factors, which were: social influence, business process fit, training and education, support and communication. As shown in our research, three external factors (training and education, business process fit and social influence) have significant impact on PEOU and PU.

Results of ANN models generally confirm findings obtained by SEM, with some minor differences, which may be explained by non-linear nature and higher prediction accuracy of ANN models. These differences are important from the organizational and managerial point of view. The ANN analysis found SI as the most significant predictor of PU, after PEOU, with twice stronger impact than TE, which further implies that managers should use various forms of social influence, including word-of-mouth i.e. recommendations from colleagues, to improve perceptions of employees that ERP systems are useful. In addition, SI was found as the strongest predictor of PEOU, so the same channels and efforts should be used to improve employees’ perceptions that ERP systems are ease to use. Finally, although PEOU was found as the main predictor of employee’s attitude towards ERP systems, PU also had very significant influence, so both factors should be taken in mind i.e. in order to improve employees’ attitude toward ERP systems, managers should provide more information on the usability and easy usage of ERP systems to the employees.

The use of the two-stage predictive-analytic SEM-ANN analysis may provide a more holistic understanding and provide significant methodological contribution from the statistical point of view. This is because the non-compensatory neural network analysis is able to complement the weaknesses of the compensatory and linear SEM analysis (Leong et al. 2015). The research will open another new perspective in understanding the impact of external factors, PU and PEOU on AT. This is one of the significant additional contributions to the existing literature in the sense of artificial intelligence was applied in a new context. The use of suggested multi-analytical approach i.e. combination of SEM and neural network models provides two important benefits. First, it enables additional verification of the results obtained by the SEM analysis. Second, this approach enables capturing linear but also complex nonlinear relationships between antecedents and dependent variables and more precise measure of relative influence of each predictor.

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CHALLENGES OF IMPLEMENTATION OF STUDY ORIENTED IT SYSTEMS

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Abstract: *The growing level of complexity of information and data related to study oriented processes at higher education institutions (HEI) strengthen the need of efficient integration of IT solutions focused on this area. This complexity is a result of a dynamic processes of change and transformation that can be observed especially within the European Higher Education Area. One of the important aspects in this context is the level of transnational students' mobility which intensifies data exchange between various study oriented IT systems from different countries. The second is the growing amount of data and information required from universities by higher education reporting systems and institutions. This means that IT study oriented systems should focus not only on monitoring and storing student data with relevant information about the grades or exams completed but also facilitate communication between administrative staff and faculty members across multiple departments, provide advanced analytical tools for reporting tasks or offer functionalities for organizing recruitment and enrolment of prospective students. As a consequence, implementation processes of study oriented IT systems become more complex in terms of modules and functionalities offered by the systems, integrations with other IT solutions, especially systems focused on financial accounting and controlling and many other aspects. Since the level of implementation complexity increases, the group of stakeholders involved in this process has to be more diverse. It embraces not only various types of system users but also representatives of external institutions and governing public bodies with their various requirements concerning reporting, quality assurance etc. Taking all these conditions into account, it is obvious that implementation has to be preceded by the deep analysis and consideration focused on methods and methodologies that should be used in the context of higher education institutions. These methods have to refer not only to technical issues but also to specific character and processes of higher education institutions. The article focuses on study oriented information systems used by Polish universities and refers to methods of their implementations related to traditional waterfall methodologies and agile approach to run IT projects.*

Keywords: *information systems, integrated management systems, study oriented IT services*

JEL Classification: *information and internet services, computer software (I86)*

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INTRODUCTION

It is hard to imagine efficient functioning of present organizations without development and implementation of information system (SI) supported by modern IT technologies and tools. It refers also to the area of higher education, since for a university this is a well-planned and implemented information system which is a guarantee of effectiveness in using data and information which grows rapidly in the amount and diversity. The broader context of information society in which universities fulfil their mission results in the increase of requirements concerning usage of IT technologies for communication processes. They relate to university management or teaching and research activities, with a special focus on social media and mobility. Easy and quick access to actual data allows university managers for taking appropriate and decisions. As the result, the process of implementing IT technologies in higher education institution is a challenge, when looking from technical but also organizational angle (Dębiec, 2014).

The aim of this article is the comparison of selected Management Information System (MIS) used by Polish universities and the discussion about the challenge of integration of new solutions with existing IT systems within universities. Article focuses also on some aspects of traditional and agile methods which can be used by higher education institutions implementing these types of systems.

MANAGEMENT INFORMATION SYSTEMS IN A CONTEXT OF HIGHER EDUCATION INSTITUTION

There is a widespread recognition that higher education institution operates in a very dynamic external context concerning local, national and international level. Moreover, the pressure they meet coming from various external stakeholders, institutions or government bodies raises the importance of information (Marcella, Knox, 2004). Information is always processed and derived from raw data in a specific context with its impact on the final information meaning (Piccoli, 2008). This complexity requires strategic approach for the information management using IT technologies. It is worth to mention that in modern organizations the value and importance of information often exceeds these linked with classic material resources (Stępień, Miciuła, 2016).

From a general point of view, an information system (IS) can be defined as a set of interrelated components whose aim is the collection (or retrieval), processing, storage and distribution of information with the main goal to support decision making and control in an organization (Laudon, Laudon, 2004). Information systems also provide assistance in problem analysis, especially those of the complex character. G. Piccoli (2008) defines information systems as a sociotechnical organizational systems planned to collect, process, store and distribute of information. This sociotechnical aspect underlines the fact that the real impact of IT technologies does not occur in isolation but has strong relations with other aspects of an organization internal environment. Human controllers of an organization using management information system can „read off“ the actual state of different parts of its internal environment (Robson, 1994).

Higher education institutions (HEI) combine wide range of activities, which are addressed not only to academic community itself but more and more to external stakeholders at local, national and international level (Baczko-Dombi, 2017). Specific character of HEI determines to a great extent not only the group of functionalities study oriented information system should provide but also appropriate methods of its implementation. These systems have to offer tools to collect and analyze all information concerning various aspects of student education path, from the admission process and enrollment, grades and attendance reporting to keeping contacts with former graduates or eliminating security risk at campuses. In general, all these functions are

mainly focused on storing information and providing tools for easy communication. There are also many factors that are situated outside HEIs but their importance is growing. It is enough to mention various organizational models of universities or increasing importance of external socio-economic environment, which hampers system design and implementation (e.g. increasing requirements concerning external reporting). The new Polish Law on Higher Education coming into force from October 1st 2018 (called Act 2.0) complicates even more this image.

COMPARISON OF STUDY ORIENTED PROGRAMS AT POLISH UNIVERSITIES

Study oriented information system (SIS) modules, like other IT integrated systems of management (i.e. ERP solutions) have to embed in their business logic rules and conditions determined by Polish legal system. As this legal framework changes dynamically, systems like SIS must be very frequently adapted to these new conditions. This is money and time consuming task but it is worth doing since the efficient study oriented system is one of the competitive advantage of higher education institutions. The main processes covered by these systems are online recruitment and enrollment of candidates, course schedule planning, fee payment services, scholarships and student funding services, dormitories and many others. Another important system module concerns research activity with a special focus on financial management. Looking from the perspective of candidates, it is the efficient online recruitment service which at the very beginning build the image of modern university IT services. Course schedule planning is necessary to provide students with online registration for classes, allocate teachers and rooms for courses etc. Online students' fees payment system allows to transfer payments on individual student accounts enabling fast payment verification. These were only sample functionalities study oriented system should provide. Next paragraphs present comparison of some popular system of this kind used by Polish higher education institutions. It is not an exhaustive list but it includes systems which are very popular in higher education sector in Poland.

USOS

University Study-Oriented System (USOS) is a management IT tool systems focused on students chosen by 60 Polish universities and other higher education institutions (i.e. vocational schools) with top public Polish universities ("About USOS", 2018).

Within this group there are 50 public HEIs (which is 45% of Polish public institutions of higher education) and 10 private ones (out of 302).

These numbers show dynamic growth, especially in public higher education sector (fig. 1).



Figure 1: USOS in Polish Higher Education Institutions

Source: Czerniak M, (2018). USOS w liczbach (15 September 2018) <<https://www.usos.edu.pl/node/3919/usos-w-liczbach>>

USOS general focus is to provide complex services for students' issues at all study levels and all type of studies (bachelor, master, PhD, postdiploma etc.). The system has been launched in 2000 by the University of Warsaw (as a central Oracle database with an interface to cope with various aspects of the student issues), with the support of EU Tempus Project. At present the owner of USOS is the University Centre for Informatization (MUCI) which is the consortium of Polish higher education institutions. It means that USOS is made by universities for universities as a non-profit initiative of representatives of system users which have deep knowledge of processes related to study services. The system consists of various modules and subsystems to handle increasing number of activities like: recruitment and enrolment, study schedule planning, handling student requests, student thesis, scholarships, fee online payment service and many others. Apart from the core USOS, there are several services fully integrated with the system. These are for instance Online Candidates Recruitment (IRK), Student Web Based System (USOSWeb) providing students with the access to part of data stored in the central database, registry of diploma thesis (APD), room booking system (SRS), student survey tool or tools to evaluate teaching staff. To facilitate integration with other university systems developers can use USOS API which is a simple and fat-free REST-like protocol, which allows developers to access academic database. The main part of the system is built using Oracle Forms technology used in enterprise applications. However, USOS modules are piece by piece moved to Java technology. As for the applications linked and integrated with the core USOS part (fig.2), they are mainly Web applications with construction based on various technologies like PHP, Python, Django, Smarty or BIRT.

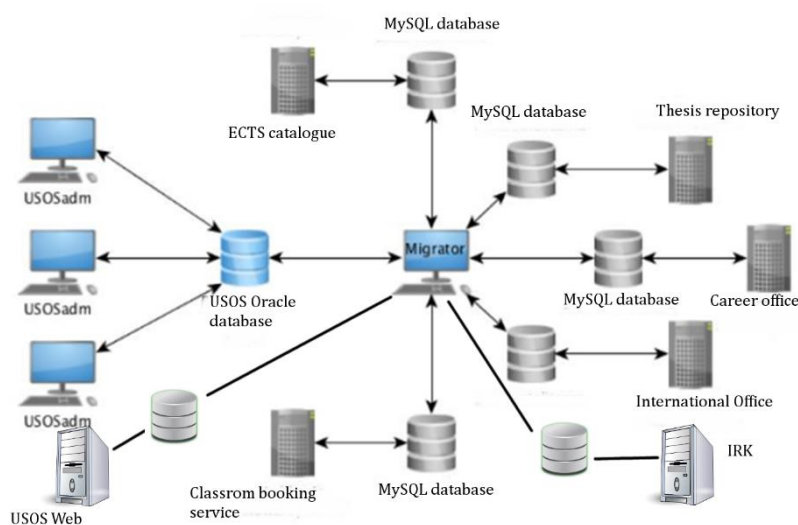


Figure 2: USOS schema with integrated applications

Source: <https://www.usos.edu.pl>

UCZELNIA 10

This system (in contrast to USOS) is offered on a commercial basis for Polish and foreign universities by Public Consulting Group (PCG). PCG group provides services for 50 Polish higher education institutions. In 2015 PCG group took over a company providing LIBRUS, one of the most popular Student Information System used by primary and secondary schools in Poland. The Uczelnia 10 solution is a system built of IT tools providing support for university management focused on the teaching process (fig. 3). Uczelnia 10 is the modernized version of the former Uczelnia XP system. Core modules are focused on student recruitment, study curricula management, student and staff financial service, course schedules management. The system may be expanded by tools concerning research output reporting, home and foreign staff mobility or data analysis. The modules included in the system can be used as the back-office

applications used mainly by the university administration and web applications addressed to students and teaching staff. The core part of the system is built using Microsoft .NET Platform using C# programming language.



Figure 3: UCZELNIA 10 schema

Source: <https://pcgacademia.pl/pl/uczelnia-10.html>

SIMPLE.EDU Platform

This system is a set of several modules focused on university teaching activities, providing tools supporting university administration and management. The overall aim is the optimization of all university processes and support for efficient communication. SIMPLE.EDU is mainly based on Java, using technologies like Spring, Hibernate, CAS for authorization and many others, depending on the module and functionalities. Universities choosing SIMPLE.EDU platform often use classic ERP provided by the company offering SIMPLE.EDU which reduces necessary efforts while integrating all university management systems and software. At present over 80 Polish higher education institutions use IT products provided by the SIMPLE company.

Student services	Virtual unversity	Admistration	BI	Mobile Apps
<ul style="list-style-type: none"> • Schedules planning • Dormitories • Tuitions • Scholarships • Internships • Examination tools • Syllabus management • Students mobility 	<ul style="list-style-type: none"> • Candidates recruitment • Registration for courses • Student surveys • Carreer Office • Research output management 	<ul style="list-style-type: none"> • Finance and Accounting • Budget planning • Assest management • Public procurement services • Document workflow 	<ul style="list-style-type: none"> • planing and budgeting • data analysis and reporting 	<ul style="list-style-type: none"> • mStudent • mStaff • msimple.dms (document workflow support)

Figure 4: SIMPLE.EDU Platform components

Source: <https://simple.com.pl>

Each of these systems have much in common, mainly in the field of functionalities they offer and university processes they address. But there are some important differences, in particular

between USOS and other two solutions. One of the reason is that USOS is not a commercial product, it is rather joint initiative of universities for universities. Hence, when a university joins this USOS „community“ it gets the access to technical documentation, source code, database documentation. In case of SIMPLE.EDU and UCZELNIA 10 it is very limited by the vendors. As the consequence, universities with USOS are able to make customization according to some specific conditions and requirements using their own IT staff which has the significant impact on the total system costs of ownership (TCO). It is important, since the need for customization and modifications arises very frequently, as higher education sector in Poland is changing at the fast pace and that process is even about to be faster, since new reforms on higher education have just started. One of the result, which has impact on information systems is that external reporting requirements (i.e. concerning POLON - integrated information system of Polish science and higher education) are changing, raising the need for new functionalities in university systems. New functionalities mean necessity for further integration with other IT systems of the university. All that leads to additional costs difficult to estimate in the beginning of implementation.

The project of implementation of information systems oriented at study services should be preceded by the reflection on the appropriate methods and implementation methodologies. Traditional waterfall approach with a comprehensive plan in the very beginning of the project realization executed in the linear continuity are, to some extent, based on the hope there will not be significant changes during realization. Hence, adding some methods and management tools from agile methodologies like Scrum may be helpful especially in overcoming obstacles caused by frequent discrepancy between users' expectancies and the proposed functionalities. Agile approach means stronger focus on the functionalities of the final version of the system. It is also usually linked with the increased involvement of representatives of end-users in many steps of implementation. These agile methods concentrate on the recognition of user requirements not only in the beginning of the project realization but during consecutive phases of the project (Chmielarz, 2012). Therefore, it allows to decrease the number of possible conflicts and support processes of change management.

CHALLENGES AND PROBLEMS OF SYSTEMS INTEGRATION

The implementation of the USOS Study Oriented System at Cracow University of Economics (CUE) is a good example of challenges arising in the field of integration with other IT systems used at a university. After the analysis of different options of USOS implementation recommended by the MUCI Consortium (provider of USOS) CUE decided to use incremental methodology, which means launching students' services within the system only (during preliminary period) for students of the first year after their enrollment. The advantages of this approach refer to easy transition to new system (progressive adaption of users to new tools), avoidance of the necessity of changes in the study regulations for present students and lower level of current data migration (only the historical data have been migrated).

On the other hand, disadvantage of this method is the challenge it raises for the USOS project implementation team and system users. The challenge refers to the necessity of using two systems (new and existing one) at the student service units (in some cases data of particular student could be processed in both system, e.g. in case of students who repeat courses).

However, one of the biggest challenge encountered by the implementation team has been (as always in implementations of this type) integration of USOS with existing IT systems and solutions used by CUE.

Even though USOS itself has the module open structure, which allows for the cooperation with other system, actually such a cooperation – even limited to the exchange of the basic data –

requires increased workload in terms of general project activities and programming tasks, taking into account different technologies used by the USOS modules.

The most important integration is the data exchange with the Egeria system of the Comarch Company³. In case of Cracow University of Economics, it provides mainly modules in the area of finance and accounting, HR management or assets management. The system is based on the Oracle database and uses Oracle Forms for the user interface.

Integration of USOS with the Egeria system has to address three main issues:

1. Retrieval data from the Egeria system referring to administrative aspects (university structure like faculties, departments, centers, units etc.)
2. Transferring data to the Egeria system referring to student payments and dues – system USOS serves as a subsidiary ledger which collects various student dues and reports all revenues (e.g. uploaded from the bank files). These data has to be register in Egeria at relevant accounts.
3. Transferring data to Egeria about courses and lectures carried out by academic staff - USOS system collects amount of hours taught by each faculty staff member, and also other activities (exams, working in University committees etc.). Egeria has to be uploaded with these data to calculate overtime and extra hours.

The first task has been already completed on the database level using synchronization scripts. The second and the third one has to be accomplished in cooperation with the Comarch Company, provider of Egeria. The realization is planned once USOS will include data of all University students.

Apart from the Egeria system, Cracow University of Economics has other IT systems which should be integrated with USOS (or USOS should replace their functionalities). These are:

- “Accreditation” system – which collects information about scientific output of academic staff and generates reports used during periodical scientific staff assessment, evaluation of University departments or accreditation of study programs by the Polish Accreditation Committee. In case of Accreditation system integration means transferring data from USOS (personal data, courses carried out, data from students’ questionnaires evaluating academic staff etc.).
- “Choose courses” system – which collects list of courses, student seminars and study program specialties, provides tools for their evaluation and recognition by authorities of each of the five Faculties and finally allows students to register for participation. Once USOS will serve all students, it will replace “Choose courses” system.
- “Chronos system” – which provides academic staff with various information about University activities (students’ list, grade protocols and other documents concerning meeting of the Faculty Councils, PhD dissertations etc.). Integration with USOS will allow to upload Chronos system with administrative and organizational data or personal data of the CUE staff.
- “KRK” system – it serves during planning of schedules of classes and syllabi, in accordance with rules of Polish Qualification Frameworks, which refers to learning outcomes in the field of knowledge, skills and social competences. This system will be further maintained and developed as it will serve USOS as the source of data about schedules of particular study programs or list of courses offered. In the moment of launching USOS, it retrieves from KRK data about schedules and courses which are used to configure track of particular study programs.
- “e-Uczelnia” system – which is the e-learning tool based on the Moodle platform⁴. The system will exchange information with USOS, exporting data about lecturers and students and importing students’ grades.

³ <https://www.comarch.com/public-administration/solutions/comarch-erp-egeria/>

⁴ <https://e-uczelnia.uek.krakow.pl/?lang=en>

- other CUE systems – IT information system of the Main Library, system of Student Career Center, student mailing service. These systems will only retrieve data from USOS about students and University staff.

CONCLUSIONS

The diversity of functional areas of modern universities requires efficient information systems especially in the field of study oriented processes. Dynamic organizational context of higher education institutions is reflected in the diversity of information systems offered for universities with a special focus on study oriented processes. The process of implementing these solutions encounters a challenge of the necessity of integration of the new system with other existing IT tool and programs and is linked with significant organizational changes. Relevant methods of implementation, benefiting both from traditional and agile methodologies ease the overall process and decrease the probability of possible conflicts.

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BLOCKCHAIN AND LAND ADMINISTRATION: POSSIBLE APPLICATIONS AND LIMITATIONS

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Abstract: Land administration system (LAS) represents a formal system that is used to locate and identify a real property and to keep record of past and current data regarding ownership, value and use of that property. A great number of public services rely on data stored in LASs. Main problems that LASs still face, in large number of countries, are related to correctness of data stored in LASs and efficiency of LASs as systems. Data stored in LASs should be correct in reference to real system it represents, but often it is not the case. Incorrectness, or errors, are usually result of mistakes made in process of digitalization. Sadly, in developing countries, those errors can also be a result of abuse of power entrusted in persons employed by Land Administration (LA) offices. Even developed countries face problems in LASs in cases of registering real estate transactions, since it can take unusual long time, months or even years to register those transactions. In this way legal uncertainty is introduced into system and during that time LASs are in incorrect state. This problem is of great importance because data stored in LASs are usually considered as always correct from legal point of view. Blockchain, as a technology that was conceptualized for the first time a decade ago, is commonly known for its application in field of cryptocurrency where it was first successfully introduced. During last couple of years, blockchain technology is moving away from being a technology used only for cryptocurrencies into other fields and researchers are looking for more and more possible applications of this technology. One of applications for this technology, that is most commonly mentioned, are LASs. Blockchain is often seen as a technology that could provide solutions for some of problems that exist in modern LASs. In this paper, each of main characteristics of blockchain (decentralization, immutability, transparency and smart contracts) is matched against problems in modern LASs. Possible advantages and disadvantages that every of these characteristics would bring in LAS, if applied, are discussed. Prospects of using different implementations of blockchain technology, mainly using permissionless or permissioned blockchain is also presented.

Keywords: Blockchain, Land administration systems, Real estate transactions

JEL Classification: L 86, R 52

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INTRODUCTION

Land is a limited resource and as such land administration is of great importance for individuals, companies and states. One example of importance of land as a resource is that over the years several countries have invested large sums of money in land reclamation projects. Those projects are usually associated with countries with small land area, such as Singapore, Monaco and Netherlands, but similar project, with even larger reclaimed land areas are conducted, for example, in in PR China, Republic of Korea and Japan. Land administration is subject of national land policy and has influence on economic development and social stability. Main tasks of land administration are to maintain data about ownership of real property up to date and to provide that information to interested parties. Land administration is done through Land Administration Systems (LAS). LAS represent a system that is used to record information about real property, mainly about location, ownership, value and use, but also data regarding physical, spatial and topographic characteristics of real property.

Even though it was suggested for a long time to eliminate separation of data regarding legal rights and spatial data in LAS (Kaufmann & Steudler, 1998), majority of LAS have data separated into two subsets: data about the ownership and other rights on real property (legal data) and data about position and shape of real properties (spatial data). Reasons for these two systems still widely being separated is that usually, process of integration results in inconsistencies in land administration databases (Pržulj, Radaković, Sladić, Radulović, & Govedarica, 2017). In (Henssen, & Williamson, 1990) two registers for storing legal and special data are identified as land register and cadastre. These two registers together form LAS.

Land register represents an official record of land or of deeds, depending on system in specific country, concerning all the changes in legal situation regarding a specific unit of land. Land register provides answers to questions about who is an owner of certain property and on what legal document is that right based on (Henssen, & Williamson, 1990).

Cadastre represents an official record of data regarding properties within a certain area. Those data are collected by process of surveying boundaries of a property and as such provide answers to questions regarding location of certain property (Henssen, & Williamson, 1990), but also about property addresses, land use, nature and duration of tenure, details about construction buildings, population and land taxation value.

There are differences how term “cadastre” is interpreted in different countries, but in this paper, we will use previously given definitions of land register and cadastre.

Importance of LAS is significant since stakeholders rely on the information acquired from LAS for making decisions. Data stored in LAS represent parts of the real world and in all legal matters data stored in LAS is accepted as correct at all times. This leads to a question of data correctness in LASs, where data correctness represents a concordance with actual (legal e.g.) situation in reality. Often, for various reasons, data store in LASs do not match real world situation. Reasons for this could be found in process of digitalization (Congalton & Macleod, 1994), human errors and time needed to register a real-world change in LAS (Bittner & Frank, 2002) or even, sadly, due to different ways of abuse. Often digitalization was done based on analog data of low quality (Congalton & Macleod, 1994) and from data stored in old “pen and paper” systems where there was no possibility of maintaining consistency of stored data. In (Stefanović, Pržulj, Stefanović, Vukmanović, & Ristić, 2017) inconsistency of data between land register and cadaster is recognized as a tool for detection of incorrectness of LAS. Modern LAS are still “plagued” by this problem, for example in Croatia only 5% of data stored in LAS is harmonized between land register and cadastre (Vučić, Markovinović, & Mičević, 2013).

Origin of Blockchain technology is tied to paper published in 2008 by person or persons under the alias of Satoshi Nakamoto titled “Bitcoin: A peer-to-peer electronic cash system”. Since then, main application of this technology was in a field of cryptocurrencies, but last couple of years, focus has been shifting to other fields, with some of large companies like Alphabet Inc., Microsoft Corp. IBM and also schools like Stanford University and Massachusetts Institute of Technology investing resources into research of this technology.

Main characteristics of blockchain technology are decentralization, immutability, transparency and smart contracts. In (Nakamoto, 2008) issue of decentralization is discussed as elimination of need for trusted third party to verify transaction, mainly to prevent double-spending in cases of crypto currencies. Immutability is used to describe a situation where reversal of payment in cryptocurrency it eliminated. Transparency in blockchain represents a fact that any change in data is public. Smart contract represent system that will allow for assets to be automatically transferred according to some predefined rules (Buterin, 2014).

In other application of blockchain technology decentralization would mean elimination of any kind of central authority, while immutability would represent an assurance that data stored in blockchain (ledger) has not been tampered with and transparency would allow all interested parties to be aware of changes made in a ledger.

In this paper decentralization, immutability, transparency and smart contracts are matched against problems in current LASs and possible applications and limitations of using blockchain technology for LASs is presented.

Paper is organized as follows: after introduction in Section 1, in Section 2 a short review of related work on a subject of application of blockchain technology in LASs will be given, while in Section 3 short description of inner workings of blockchain is presented. In Section 4 possible advantages and limitations of application of blockchain technology in LAS are presented and paper is concluded with Section 5 and recommendations for future research.

RELATED WORK

Since blockchain is still relatively young technology and since focus shifted from cryptocurrency to other areas of application with what is now known as blockchain 2.0 in 2015, with addition to Turing-complete programming languages for developing smart contracts, it is not surprising that application of blockchain in land administration is still in its early stages. Nevertheless, literature that is focused on this problem can be divided into two groups: papers presenting case studies in application of blockchain in LASs and papers focused on possible applications and limitations, like this paper, from different points of view.

Fundamentals of what is today known as blockchain technology are outlined in (Nakamoto, 2008) emphasizing that peer-to-peer network based on proof-of-work consensus mechanism could be used for executing and storing transactions without a need for trusted third party, stating that the system is secure as long as there is more CPU power in so called “honest nodes” compared to attacker nodes. Need to publicly announce transactions makes this system transparent compared to models based on trusted third party. Smart contracts were introduced to blockchain with Ethereum blockchain, a first blockchain that has a Turing complete virtual machine (Buterin, 2014). Smart contracts represent user-defined programs that specify rules that must be met for transaction to be executed, those rules are enforced by nodes in peer-to-peer network (Delmolino, Arnett, Kosba, Miller, & Shi, 2016). As such, smart contracts receive and process inputs from users or other smart contracts, write outputs and store necessary information.

Blockchain could be a solution for problems with trust in some developing countries, where there is no trust system between all the partners involved in land administration processes, where

blockchain would be a “shared single source of trust”, but creating a starting point, or Genesis block that will be a first phase of introduction of blockchain into LAS could be a problem (Vos, Lemmen, & Beentjes, 2017). Regarding accuracy, reliability, authenticity and persistence and preservation application of blockchain technology has significant potential, but further research into this subject is needed (Lemieux, 2017). Problems that commercial real estate industry face, where data, even though in digital form, are stored on disparate systems and lack of transparency and efficiency could be solved by implementing blockchain technology (Deloitte center for Financial Services, 2017).

One possible use of blockchain technology is that land is represented in 57 trillion of 3 by 3 meters squares of land and that those square, so called bitsquares can then replace coins in blockchain (Van Bochove, de Bruin, & Lemmen, 2016). Application of blockchain in land administration is discussed in (Anand, McKibbin, & Pichel, 2016) where possibilities of using colored coins (smart property) are presented, together with using this technology for deed registration, as virtual notary, for multiparty transaction and as a method for disaster preparedness. In (Kombe, Manyukuzy, & Mvuma, 2017) integration of Factom and Bitcoin blockchains into Integrated Land Management Information System is proposed as a solution for unauthorized changes in land administration and title registration process in Tanzania. In cases study conducted for Turkey, blockchain is proposed for correction of errors in digital data, where all stakeholders are equal partners in processes of cadastral survey as well as in decision-making process (Torun, 2017). Cost effectiveness, efficiency, transparency and easing administrative burden are identified as main benefits of potential implementation of blockchain technology in Indian LAS (Bal, 2017).

BLOCKCHAIN

Blockchain was initially developed as a solution for financial transactions without a need for trusted third party. In case of blockchain, trust is replaced by cryptographic proof. Blockchain represents a solution where each new block of transaction is tied to previous block, thus forming a chain of blocks.

Electronic coin (cryptocurrency) is defined as a chain of digital signatures and to transfer this electronic coin from one owner to another, owner is using his digital signature to sign a hash of the previous transaction, the public key of next owner and adds it to the end of the coin (Nakamoto, 2008). To solve a problem of double spending in blockchain proof-of-work system is introduced that presents a peer-to-peer timestamp server. In proof-of-work every block consists of three parts: transactions, hash of the previous block and nonce. The proof-of-work is in fact searching for nonce that will, together with all the other data from one block, create a hash of that block that will start with predefined number of zero bits. Since hash of the previous block hash and current transaction are immutable, the nonce is the only variable in this equation. In case of Bitcoin blockchain, nonce is a 32bits long block. For example, at the time of writing this paper, in case of Bitcoin blockchain, the goal was to find a nonce, which will together with hash of previous block and transaction have a hash that starts with 19 zero bits. Formation of blockchain is illustrated in figure 1.

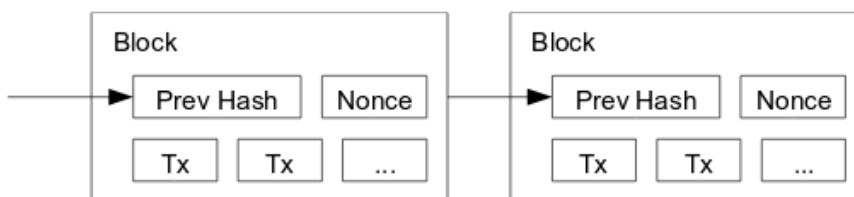


Figure 1: Formation of blockchain

Source: Nakamoto, S. (2008). Bitcoin: A Peer-to-Peer Electronic Cash System

Having a hash of previous block take part in creation of next block means that any attacker that would want to change a transaction in some block would have to do proof-of-work for all the blocks that were created after the block that was intended for a change. If this sort of attack was to happen, it will be rejected, because in case of a “split” the longest chain will still be accepted as correct one by the nodes and, as long as there are more honest nodes in network than those that are engaged in attack, all data is safe.

The steps taken by network of nodes are:

- a) Transaction is being broadcasted on the network to all the nodes,
- b) Transactions are collected in a block by each node,
- c) Nodes are trying to find a nonce for that block,
- d) Once nonce is found, the block is broadcasted to all the nodes,
- e) Block is accepted if transactions are valid,
- f) Nodes accept the block by adding it to the chain and starting to work on the next block, using a hash of accepted block as previous hash (Nakamoto, 2008).

LAS AND BLOCKCHAIN

Decentralization – As stated in section 3, blockchain was initially developed to eliminate trusted third party from transactions. As a consequence of proof-of-work, all full nodes (opposed to lightweight nodes) keep a log of previous transactions, so implementing LAS in blockchain could potentially eliminate the possibility of doing backup of LAS data. Fact that full nodes have complete history of all transaction that ever happened is of special interest in countries that use deeds systems and when in case of transfer of deed, there is a need to check the pass holders of that deed. This process is time-consuming and with entire transaction history stored in every full node this check could be performed much faster.

Decentralization provides a possibility for elimination of, usually, state-run LAS agencies. Importance of LAS is previously discussed and it does not look feasible that any state would “outsource” this job to some public (permissionless) blockchain, but on other hand there is a possibility for creating a private (permissioned) blockchain. Bitcoin and Ethereum are examples of public blockchains, anybody can participate, become a node and try to discover nonce and register a transaction. Public blockchains are managed by consensus and any decision requires the majority of nodes to agree. In general, one person/organization is not likely to have a control over majority of nodes, but at time of writing this paper, in case of Bitcoin, three largest pools of nodes, do control majority of nodes. Situation like this could raise some questions about decentralization and possibility that some other third party is having control over LAS related data of certain country. Although majority of solutions presented in Section 2 have been implemented using public blockchains, mainly because there is no need to build a new network of nodes, private blockchains could be a better solution. Private blockchain is permissioned, meaning that not everybody can join the network and become a node, with this limitation, it is possible to limit the network only to significant LAS stakeholders and still keep some level of distribution, since one state agency will not be the sole responsible actor for preserving LAS data and running transactions.

Immutability – Blockchain is often referred as “trust machine”, mainly because once a transaction is stored in blockchain it should be impossible to change it. This is why LAS implemented in blockchain are presented as a good solution for developing and transitional countries, where the lack of trust in state run agencies is a problem. Immutability is probably one of main advantages that blockchain can offer to LAS. But it is important to, once more, raise a question of choosing between public and private blockchains. Although public blockchains should be held as immutable, in past there were occasions when history of transactions did occur.

Most notably in 2016 when, due to “The DAO attack”, change was made to Ethereum blockchain allowing users who lost their ether in this attack to retrieve their funds. In that case, immutability principle was compromised and it resulted in so called hard fork. Ethereum blockchain was split into, Ethereum, consisting of nodes that supported this change and Ethereum Classic with nodes that were against this change. This is something that LAS solution based on public blockchains should be ready to handle. In other hand, in case of private blockchains, depending on number of stakeholders, question of immutability could be raised all together, since it is possible that if number of stakeholders is limited, it is easier for someone to run 51% of all nodes and thus try to create a new “blockchain” history. Again, this represent an issue that should be addressed during the process of creation of private blockchain.

Transparency – As explained in section 3, in blockchain, all transactions are public and this characteristic coincides with LAS since LAS are public records. But blockchain parties are identified by their public keys and until recent regulations, it was not necessary to have any kind of connection between individuals and their public key so that they could take part in cryptocurrency transactions. In case that blockchain technology is used for transactions in LAS, one of the obstacles would be that it would be necessary to have some sort of connections between persons, and their public key. Currently, for transactions in LAS, either LAS or notaries are held accounted for establishing the identities of persons involved in transactions of real properties. This requirement should not present a problem, at least not in case of developed countries, since at this time, majority of developed countries do accept digital signature in everyday use and have bodies that are issuing digital signatures to their citizens.

Smart contracts – Apart from immutability, probably the greatest advantage of application of blockchain in LAS are smart contracts. Smart contracts are in fact applications written and stored in blockchain. As they are stored in blockchain, they are also immutable, so it should not be possible for anyone to temper with smart contracts stored in blockchain. Smart contracts have a possibility to automate certain operations, to run them when conditions are met and as such could find use in LAS. For example, As LAS have a large number of stakeholders, smart contracts could be created to notify stakeholders of changes made in LAS. A simplest example could be that once change of ownership is registered in LAS, other institutions should be informed about that changed. This job usually falls on parties involved and sometimes are done by notaries, but usually not all interested parties are informed. For example, state tax agency could be informed, but also utility companies have interest in knowing that they should change billing information from certain date to another person or company. It is also important to mention that as well as any software application, smart contracts could be written poorly and one poorly written smart contract was responsible for previously mentioned hard fork in Ethereum blockchain. So, due to immutability, extra steps should be performed to secure that smart contracts are written well and that they will behave as expected.

CONCLUSIONS AND RECOMMENDATIONS

In general, blockchain technology could have possible application in LAS. There are some limitations and questions yet to be discussed, but certain processes could surely benefit from implementation of blockchain technology. Mainly trust in data stored in LAS in case of developing and transitional countries and time needed for registering changes in data stored in LAS, since currently, it could take several months, in case of Sweden, to between one and two years in case of Serbia, to transactions to be registered in LAS.

Possibility of implementing entire LAS in blockchain is still opened for debate. LAS have a large amount of data stored in them, both legal and spatial, and in case of application of permissionless blockchain, main limitations would be that only hash codes of documents could be stored in blockchain, requiring some other way of storing documents, either for example in torrents or

InterPlanetary File System. On other hand there is a possibility of using permissioned blockchain, that are for example implemented using Hyperledger technology, that would allow certain documents to be stored in blockchain.

There is limited number of peer reviewed papers on possible application of blockchain in LAS so this field is still in early stages of development and only couple of case studies, so further research in this field is necessary if benefits of blockchain technology could be brought to LAS.

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MEASURING EFFICIENCY OF THE SERBIAN NATIONAL INNOVATION SYSTEM: DEA APPROACH

Ana Krstić¹, Predrag Mimović²

Abstract: Globalization of the modern world market has imposed the existence of an efficient national innovation system as a necessary precondition for the equal participation of a region and state in global development. Under these conditions, only successful participation in the global market can provide the desired prosperity and progress at the national level. In order to achieve global competitiveness and competence, both the economy and all other segments of society, it is necessary to achieve the state of permanent specialization and development of society. Evaluating the efficiency of innovation systems can serve as a substantial enabling tool for policy making serving to identify best practices and develop potential improvements of actions and strategies. It also serves to provide valuable insight in understanding the nature and dynamics of innovation process at its different stages and levels. Data Envelopment Analysis (DEA), variant of linear programming, provides the required weights and then analyzes relative macroeconomic performance. DEA was developed by Charnes, Cooper and Rhodes (1978) to evaluate the relative performance of a collection of similar public sector units which provides multiple services that are not all priced on markets. DEA deals with evaluation of the performance of Decision Making Units (DMU) performing a transformation process of several inputs several output. It can be concluded that data envelopment analysis is a set of models and methods that are based on linear programming which provides a means for calculating the efficiency of the units within the group organization. Although DEA was originally intended for use in microeconomic environments, it is ideally suited for the macroeconomic performance analysis. DEA is appropriate analytical technique for evaluating the relative efficiency of national innovation system. The aim of the paper is to review the relevant literature and to measure efficiency of Serbian national innovation system using DEA method. Inputs and outputs which are used in the analysis are the main indicators of innovations and R&D. In the analysis decision making units are regions of the Republic of Serbia. Observation period is 2012-2016. The work is significant because it shows which region of Serbia is most efficient in terms of innovation and research and development. On the other hand, it provides information which regions need to be improved and which indicators should increase or decrease in order to be effective in terms of innovation.

Keywords: Efficiency, R&D, Inovations, Data Envelopment Analysis

JEL Classification: C02, C67, O30

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INTRODUCTION

The concept of the national innovation system is one of the most important instruments for the implementation of the Science and Technology Development Policy. The globalization of the modern world market has imposed the existence of an effective national innovation system as a necessary prerequisite for the equal participation of a region and the state in global development. Under these conditions, only successful participation in the global market can provide the desired prosperity and progress to local level. In order to achieve global competitiveness and competence, both the economy and all other segments of society, it is necessary to achieve the state of permanent development and development, ie an innovative society is needed (Kutlaca and Semencenko, 2005).

Data Envelopment Analysis (DEA), variant of linear programming, provides the required weights and then analyzes relative economic performance (Lovell et al. 1995). DEA was developed by Charnes, Cooper and Rhodes (1978) to evaluate the relative performance of a collection of similar public sector units which provides multiple services that are not all priced on markets. DEA deals with evaluation of the performance of Decision Making Units (DMU) performing a transformation process of several inputs several outputs (Bouyssou, 1999). It can be concluded that data envelopment analysis is a set of models and methods that are based on linear programming which provides a means for calculating the efficiency of the units within the group organization. Although DEA was originally intended for use in microeconomic environments, it is ideally suited for the macroeconomic performance analysis. DEA is appropriate analytical technique for evaluating the relative macroeconomic performance of nations.

The aim of the paper is to review the relevant literature and to measure efficiency of national innovation system of Republic of Serbia using DEA method. Inputs and outputs used in the work are those most frequently used in contemporary literature in this field. The units of observation in this research will be the regions of the Republic of Serbia in the period of 5 years (2012-2016). The model consists of three inputs (number of R&D organizations, employees in R&D and R&D fund) and one output (number of scientific research papers per year observed). The paper is organized as follows. The first section provides a review of the literature using DEA method for measuring efficiency of national innovations systems. The second part presents the methodology of the Data Envelopment Analysis. The third part provides the description and structure of the problem, after which the corresponding DEA method is applied. Next steps will be overview of the results and their interpretation. At the end of the paper, the conclusions with appropriate guidelines will be given.

LITERATURE REVIEW

Innovation is usually accompanied by a business process. Although the innovation systems approach leads to non-linear thinking about complex innovation mechanisms, a “linear” view of innovation is still dominant from a production point of view. In this, the development of an innovation production activity is seen as a process made up of sequential stages that are temporally and conceptually distinct and characterized by unidirectional causal relationships (Rossi and Emila, 2002). One of the ways to calculate efficiency is Data Envelopment Analysis. There are a variety of literature that deals with the usage of DEA method for measuring the national innovation system. Different combinations of variables can be taken as inputs and outputs within DEA method. Matei and Aldea (2012) used DEA method to measure and compare the performance of the National Innovation Systems using the information available in IUS 2011 database. In order to fulfill this purpose, the variables describing the innovation process included in this database are used to estimate the technical efficiency of the EU27 Member States as well as Croatia, Iceland, Norway, Switzerland and Turkey. There are European Commission

assumption is that Innovation can be translated into new goods and services that create growth and jobs and thus innovation becomes one of the most important pillars of European economy. Guan and Chen (2012), proposed a relational network data envelopment analysis (DEA) model for measuring the innovation efficiency of the NIS by decomposing the innovation process into a network with a two-stage innovation production framework, an upstream knowledge production process (KPP) and a downstream knowledge commercialization process (KCP). They considered 22 OECD countries. Kotsemir (2013) in this paper provides a comprehensive review of 11 empirical studies on cross-country analysis of NIS efficiency with DEA technique. In its main part the paper analyses the specifications of DEA models used in the reviewed studies, the content of the country samples, sets of input and output variables used and the resulting lists of efficient countries. It is interesting that many authors have dealt with the efficiency of the innovative system of the OECD countries. Kou et al. (2016) calculated the innovation efficiency of OECD countries in the multi-period and multi division context, which presents an analytical technique and some systemic evidence for national innovation investment decision in the long run. In this article inputs are R&D expenditure (*The incremental R&D expenditure during the observation year*) and R&D personnel (*The full-time equivalent measures of the input in the brainwork for the upstream R&D process*) and outputs are *the product exports in aerospace, computers, pharmaceuticals, scientific instruments, and electrical machinery and the ratio of gross domestic product (GDP) to total employment in the economy*. Our work is specific in a way that our idea is to measure the efficiency of the national innovation system of the Republic of Serbia by regions within a period of 5 years. Each region is one decision making unit.

METHODOLOGY

The creators of the DEA, Charnes, Cooper and Rhodes have proposed a mathematical approach to calculate the efficiency of which is non-parametric techniques, i.e. it does not require a specific functional form. It is used to evaluate the performance of Decision Making Units (DMU). They have reduced multiple inputs to a single "virtual" input and multiple outputs reduced to a single "virtual" output using the weight coefficient (Charnes et al. 1978). DEA methodology proved to be adequate to evaluate the effectiveness of non-profit organizations that operate outside the market, because in their case performance indicators such as revenue and profit do not measure efficiency in a satisfactory manner. DEA compares service units considering all resources used and services provided, and identifies the most efficient units or best practice units (branches, departments, individuals) and the inefficient units in which real efficiency improvements are possible. This is achieved by comparing the mix and volume of services provided and the resources used by each unit compared with those of all the other units. In short, DEA is a very powerful benchmarking technique (Sherman and Zhu, 2006). Unlike typical statistical methods, data envelopment analysis is based on extreme observations comparing each decision making unit only with the best of DMU. If the unit can be done then it is relatively ineffective, and if not, it participates in the formation of border efficiency that is equivalent to the marginal production function. General DEA model is formulated in the following manner (Charnes et al., 1978):

$$\max h_{j_0} = \frac{\sum_{r=1}^s u_{rj_0} y_{rj_0}}{\sum_{i=1}^m v_{ij_0} x_{ij_0}}$$

Where:

y_{rj} = output value

x_{ij} = input value

u_{rj} = weight coefficient of output y_{rj}

v_{ij} = weight coefficient of input x_{ij}

$r = 1, 2, \dots, s$ = number of achieved products

$i = 1, 2, \dots, m =$ number of used resources

$j = 1, 2, \dots, n =$ DMU number

However, DEA method can be expose through several models. Some of them are DEA model with constant returns to scale (CRS), dual CCR model and DEA model with the variable yield on the scale (BCC) (Seiford et al. 1998). In the paper will use the model with a constant yield on the scale that can be written as follows: (Cook et al. 2009):

$$(\text{Max}) \ h_k = \frac{\sum_{r=1}^s \mu_r y_{rk}}{\sum_{i=1}^m v_i x_{ik}}$$

s.t.

$$\frac{\sum_{r=1}^s \mu_r y_{rj}}{\sum_{i=1}^m v_i x_{ij}} \leq 1, \quad j = 1, 2, \dots, n$$

$$\mu_r \geq 0, \quad r = 1, 2, \dots, s$$

$$v_i \geq 0, \quad i = 1, 2, \dots, m$$

Where:

h_k – relative efficiency of k DMU;

n – DMU number that can be compared;

m – input number;

s – output number;

u_r – weight coefficient for output r ;

v_i – weight coefficient for input i .

The above model shows the overall technical efficiency, which includes pure technical efficiency and effectiveness, which are a consequence of the different scope of operations. The main objective is to maximize value h_k by making each DMU assigns a value to a variables u_r and v_i that will present it on a better and more efficient way (Ozdemir, 2013).

RESULTS AND DISCUSSION

In our work CRS model (input-oriented) was presented, that calculates the relative efficiency of the national innovation system of the Republic of Serbia by regions. Four regions of the Republic of Serbia were considered (Belgrade, Vojvodina, Sumadija and Western Serbia, Southern and Eastern Serbia) and each region presents one decision making unit (DMU). The observation period is five years (2012 - 2016). In order to obtain reliable results, it is necessary to apply an adequate analysis of the efficacy variables as dependent on the quality of the selected output, i.e input values. From studied literature can be seen that there is not quite clear attitude which variables are most appropriate to describe the problem. In various studies different combinations of variables were mentioned. The most commonly used in the literature are taken for input and outputs in the work. The model consists of three inputs (*number of R&D organizations, employees in R&D and R&D fund*) and one output (*number of scientific research papers per year observed*). Collected data were taken from the site of the Statistical Office of the Republic of Serbia, and are shown in Table 1.

Table 1. Structuring the DEA Model for Evaluating the Efficiency of the Republic of Serbia Economy

DMU	2012.				2013.				2014.				2015.				2016.			
	I1	I2	I3	O1	I1	I2	I3	O1	I1	I2	I3	O1	I1	I2	I3	O1	I1	I2	I3	O1
Belgrade	155	11838	24476495	7285	150	12 027	19825520	7178	168	12545	20653628	7864	169	13737	24112725	3193	172	13405	24397360	5225
Vojvodina	33	4345	5864054	2241	29	5442	6170162	2158	40	6254	7228402	1897	41	6005	8213703	2392	45	6298	10934838	2567
Sumadija & Western Serbia	32	1434	1024805	660	28	1508	897307	624	31	1506	920201	590	37	1575	1269158	1196	35	1628	1140112	525
Southern and Eastern Serbia	25	2029	1140410	1307	30	2067	1282340	1319	34	1575	1282156	1641	32	2312	1394987	2005	31	2211	1483965	1579

Source: <http://data.stat.gov.rs/19.10.2018>

Based on the collected data which were analyzed using the software package *MaxDEA7 Basic* the following results were obtained as shown in Table 2. The average relative efficiency of the observed decision units is 0.86, which means that each region 86% of the inputs on average should be used in order to achieve the same value of the results and effective functioning of the Republic of Serbia innovation system. The combination of selected inputs and outputs gives interesting results in terms of the relative efficiency of the observed regions. Namely, the region of South and East Serbia is relatively efficient in terms of innovation in all 5 analyzed years. And the region of Belgrade is effective only in 2013. Given the input and output values that could be seen in the previous table, when all these variables are placed in the DEA ratio, the result is not surprising. Relative efficiency values for other regions can be seen in Table 2. Of course, the obtained efficiency rating depends to great extent on a selected variables that are the subject of analysis. A deeper analysis and insight into the concrete results can reveal that the innovation indicators do not contribute to increasing efficiency.

That is, you can see how much work is required to increase (decrease) a certain input variables in order to achieve the same level of output, if the input variables are used in an efficient manner. On the other hand, DEA method for efficiency analysis can easily lead to incorrect conclusions, therefore, only concrete and obvious conclusions should be kept.

Table 2. Efficiency of the National Innovation System of the Republic of Serbia for the Period 2012-2016, Measured by Applying DEA Method

DMU Name	Efficiency – input oriented CRS model				
	2012.	2013.	2014.	2015.	2016.
Belgrade	0,955339	1	0,96985	0,584857	0,589586
Vojvodina	1	1	0,982602	0,931136	1
Sumadija & Western Serbia	0,714498	0,676086	0,500958	0,875637	0,451556
Southern & Eastern Serbia	1	1	1	1	1

Source: Authors

DEA methods measure and projections of inputs, and their values are shown in Tables 3. The projections shows that we can get the same output value if some input values were lower of higher in the observed periods. We can see that the target and actual values for the relatively efficient years and regions were equal. For example, region of Belgrade should reduce the value of all observed inputs for each year except for 2013, to become relatively efficient

Table 3. Projected input values for each observed year by region

DMU Name	Projections of inputs														
	2012.			2013.			2014.			2015.			2016.		
	I1	I2	I3	I1	I2	I3	I1	I2	I3	I1	I2	I3	I1	I2	I3
Belgrade	139,3	11309,3	6356455,1	150	12027	19825520	162,9	7547,7	6144347,8	98,8	7141,2	4308805,2	101,4	7903,4	6761147,1
Vojvodina	33	4345	5864054	29	5442	6170162	39,3	1820,7	1482175,5	38,2	2758,2	1664243,8	45	6298	10934838
Sumadija & Western Serbia	12,6	1024,6	575876,5	14,2	977,9	606656,7	12,2	566,3	460982,35	19,1	1379,1	832121,9	10,3	735,14	493401,9
Southern & Eastern Serbia	25	2029	1140410	30	2067	1282340	34	1575	1282156	32	2312	1394987	31	2211	1483965

Source: Authors

CONCLUSIONS AND RECOMMENDATIONS

The paper presents the DEA panel for calculation of the innovative efficiency of the national system, which was the main goal of the research. According to the obtained results, within the observed period, region of Southern and Eastern Serbia was relative efficient in each year. The results showed how it would be best to combine the observed inputs and outputs in order to achieve more rational use of resources and better functioning of the economy of the Republic of Serbia and its regions. The analysis of the obtained values of R&D indicators shows, despite numerous problems of economic and financial nature which objectively burdened it and influenced relatively smaller allocations in this area, especially in relation to EU member states, Serbian society rationally and relatively efficiently used the available R&D resources. Work can be improved by expanding the database and by including more inputs and outputs in analysis. This research provides an adequate basis for further research dealing with R&D indicators measuring efficiency.

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Working Paper No. 9106.

DIGITAL TRANSFORMATION WITH CLOUD-BASED CUSTOMER RELATIONSHIP MANAGEMENT SYSTEMS

Nenad Stefanović¹, Mladen Janjić², Jelena Plašić³

Abstract: *In today's globalized, fast-changing, highly competitive and customer-oriented business environment technological innovations are driving new digital transformation that will fundamentally alter the way people live, work and connect. Capitalizing on this phenomenon is the key to innovation and growth. In response, companies are going through a digital transformation that is creating huge opportunities, but also brings many challenges. Each company is attempting to digitally transform to achieve the same three outcomes – to engage customers, empower employees, and optimize operations. They are forced to reassess business and IT strategies in order to stay competitive. For most businesses, the focus is on customer relationship management (CRM) and providing optimal customer experience along the value chain. As they reinvent how to connect and engage with customers in new ways, companies also need to transform how they empower employees, so they can help drive optimized operations that lead to transformation of products and services. Even though CRM is crucial for any company to survive and even thrive, a CRM solution is only successful when approached as an enterprise-wide initiative, backed by a careful planning, thorough implementation and integration strategy, and related services.*

On the other hand, most of the existing CRM solutions are based on isolated and heterogeneous legacy information systems that are difficult to integrate, customize, and operate. Digital transformation requires intelligent systems which are tailored to each industry, each company, each micro-task performed by each person. Systems that can learn, expand and evolve with agility as the business environment and customers' demands change. While CRM software has been around for several decades, the biggest gamechanger in recent years has been the migration of CRM to the cloud. Besides being faster, more agile, feature-rich and user-friendly, it is also cost effective for businesses of all sizes.

In this paper, we discuss main benefits, issues, and challenges related to CRM systems, and provide background research of current results, initiatives, approaches, and trends related to customer engagement. Next, we introduce strategy and implementation framework for CRM systems which encompasses three main phases: envisioning, onboarding, and driving value. Finally, we present the cloud CRM system that delivers crucial customer engagement insights and tools within user-friendly, business-friendly and innovative cloud-based platform. The goal of this platform is to provide always-on, connected experiences with contextually relevant and personalized information to actively nurture customers to conversion and ongoing usage and engagement..

Keywords: CRM, Cloud, Information Systems, e-Business, Analytics

JEL Classification: L81, L86, C88.

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INTRODUCTION

Demanding customers, globalization, deregulation, increasing competition, maturing markets and industry convergence forces businesses to treat customers as a critical source of profitability and sustainable growth (Sen and Sinha, 2011). Customer Relation Management (CRM), also known as relationship marketing, addresses this issue, and it is the overall process of building and maintaining profitable customer relationships by delivering superior customer value and satisfaction.

CRM emerged during the 1990s in the business domain as an approach that stems from the need to create new business environment, which allows a more effective management of relationships with customers (Galbreath and Rogers, 1999). *CRM is a strategic process of selecting customers that a firm can most profitably serve and shaping interactions between a company and these customers. The ultimate goal is to optimize the current and future value of customers for the company* (Kumar and Reinartz, 2012).

CRM processes provide support to business strategies, including customer identification, attraction, retention and development of sustainable relationships with customers (Ngai et al. 2009). From that point of view, developing close and long-term relationship with customer, as well as turning them into loyal customer are of great importance for successful marketing, because customer are crucial assets that companies can learn from to obtain greater competitive value.

In a review paper (Soltani and Navimipour, 2016) five categories in which CRM plays a significant role are classified: E-CRM, knowledge management, data mining, data quality, social CRM. The same paper provides studies in each category and discusses determinants of CRM. Some authors proposed a concept of early mover advantage (EMA), as given in (Wang et al. 2016), claiming that early move into a new market place may acquire certain advantages over subsequent entrants, and thus achieving better competitiveness.

Besides new market entry, adopting a new technology, e.g. Internet, is an important strategic choice for companies, like adoption of e-commerce platforms (Fawley and Fahy, 2005). E-commerce platforms are online platforms that provide technological solutions to numerous small and big sellers and re-sellers. Among the first e-commerce platforms the most popular and successful were Amazon and eBay.

Current trends in CRM are a consequence of strategies used by companies to compete with rivals in the contemporary business marketplace (Chang et al. 2014). The best CRM practice of how to improve the relationship with existing customers and finding new prospective customers, as well as winning back former customers, is usually presented as a 360-degree view of the customer (Figure 1). It is a single, end-to-end picture of the customer's journey with a company and how they felt at steps along the journey. It provides a strategic approach for businesses to offer the best customer experience across all channels by unified view of all customer interacting points with all departments involved in customer relationships. This view is obtained by aggregating the data the company captures about its customers and their interactions (Call Center Helper Magazine, 2018).

However, recent development of Cloud Computing has been of essential importance to further development and improvement of CRM. As SaaS is the most advanced model of Cloud Computing, providing complete functionality to meet the specific needs of companies, it represents the best approach to automation for Customer Relationships Management through CRM systems (Němeček and Vaňková, 2011). Cloud Computing provides benefits such as no need for any large investment into hardware or software, lower operating costs, easier deployment and maintenance, no platform dependency, user friendliness, an option for users to

pay what they really use, no hardware lifetime maintenance or upgrades, automation of backups and upgrades, integration with other services, etc.

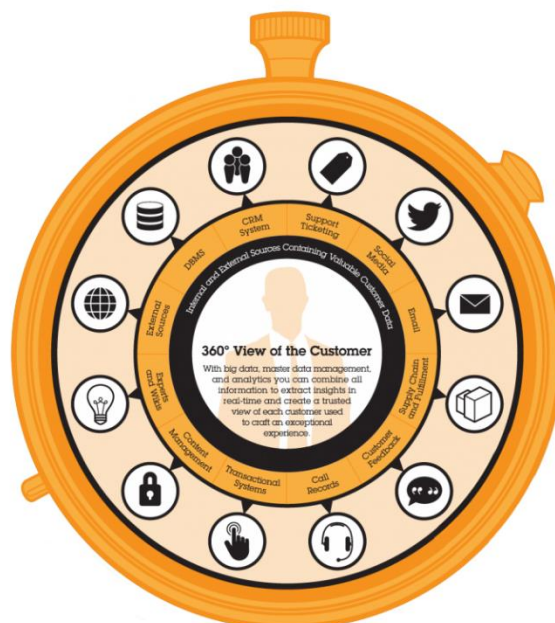


Figure 1: Customer 360

Source: IBM Big Data & Analytics Hub

<https://www.ibmbigdatahub.com/infographic/infographic-enhanced-360-view-customer>

Nationwide Survey by The Values Institute in showed that among the companies that provide cloud computing services, the two are among the top three most trustworthy brands in USA that connect best with their customer base, Amazon being the first and Microsoft the third, with Marriott hotels and resorts taking the second place (The Values Institute, 2017). Some of the most important principles that contributed to the success of Amazon are lack of need customer service, easily accessible option for human support, loyalty incentives, protecting customers, etc. (ChannelReply, 2016).

Amazon Web Services (AWS) provides on-demand cloud computing platforms to individuals, companies and governments since its launch in March 2006, with public beta launch of Amazon Elastic Compute Cloud (EC2) in August 2006, which allows users to rent virtual computers and run their own applications on them. Microsoft launched its own cloud computing platform in February 2010, as Windows Azure, renaming it later to Microsoft Azure. One of these two cloud services by the two of the most famous companies in IT industry is usually the first choice when thinking about moving CRM to the cloud.

LITERATURE REVIEW

In order to increase competitiveness in the contemporary business marketplace, companies develop customized products or services to quickly respond to customer requirements and create different levels of value for individual customers, for which CRM has been widely recognized as an important business approach to build long term profitable relationships with specific customers (Chang et al. 2014, Coltman et al. 2011, Ngai et al. 2009).

Companies implement CRM in the hope to achieve better target profitable segments, improve customer service, enhance customer retention and ultimately increase financial performance (Josiassen et al. 2014, Peppers and Dorf, 1999). Numerous studies confirmed the importance of CRM implementation on several customer-related outcomes (Gustafsson et al. 2005, Wu and

Lu, 2012), more specifically on customer satisfaction (Boulding et al., 2005), customer retention (Yim et al., 2004) and customer knowledge (Mithas et al., 2005).

The question is which among many CRM solutions to use, especially for directors of IT departments. Some companies develop in-house solutions due to various reasons, the most important being the initial price and very high customization needs of existing solutions, but many businesses needs can be met with existing CRM solutions offered by various software vendors. In order to help business leaders who seek technology solutions for interacting and engaging with their customers, Gartner conducts a thorough analysis of service providers in the customer service and support application space every year. The result of the analysis is the well-known *Gartner Magic Quadrant for the CRM Customer Engagement Center* report, in which graph shown in Figure 2, with the same title as the report, shows positions of analyzed service providers in one of four quadrants: leaders, challengers, visionaries and niche players.



Figure 2: Magic quadrant for CRM and Customer Engagement Center

Source: Gartner (May 2018)

Essentially, nowadays companies can choose between two distinct types of CRM solutions: on-premise and cloud based. On-premise means that CRM software is installed on a local server, usually within the company’s building, while cloud based solutions have a wide range of variations, from rented servers and virtual private servers to software as a service (SaaS) solution. Concerning CRM software, this means that users (companies or small businesses) are spared from high initial costs for hardware and software, and have just to pay a monthly fee. Besides lower costs, hardware and software scaling became much easier and realized with a simple click of the mouse, while additional services can be used, like online e-mail client, business intelligence, online promotions, etc. That is why many businesses are moving from local on-premise software to cloud computing nowadays, and even more specifically, to Software-as-a-Service (SaaS) model.

Also, when choosing the right solution, potential problems should be taken into account. Like any IT projects, CRM projects are not prone to failures. Numerous searches were conducted by different organizations, with results presented in Table 1 for period 2001-2009.

According to (Almotairi, 2009) and cited literature therein, the following are the most frequent reasons for CRM projects failures: 1. Lack of management support; 2. Lack of customer-centric culture; 3. Poor quality data; 4. Thinking of CRM as a pure technology; etc. But, in a study that

involved 700 companies (Forsyth, 2001) more general factors of causes for CRM failure are given: organizational change (29%), company policies or inertia (22%), little understanding of CRM (20%), poor CRM skills (6%).

Table 1. Failure rates of CRM projects

Year	Organization	Failure rate
2001	Gartner Group	50%
2002	Butler Group	70%
2002	Selling Power, CSO Forum	69.3%
2005	AMR Research	18%
2006	AMR Research	31%
2007	AMR Research	29%
2007	Economist Intelligence Unit	56%
2009	Forrester REsearch	47%

Source: <https://www.zdnet.com/article/crm-failure-rates-2001-2009/> (August 3, 2009 - 06:15 GMT)

Since the introduction in 2010, Microsoft has done much to improve its cloud-based services. With continuous introduction of new services to its Office 365 cloud-based software as a service, Microsoft also released Dynamics 365 product line of enterprise resource planning (ERP) and customer relationship management (CRM) applications in November, 2016. However, these two categories of applications were separated the following year, with CRM applications offered as Customer Engagement Plan, and ERP applications, called Microsoft Dynamics 365 for Finance and Operations, offered only as part of Unified Operations Plan, which also includes Dynamics 365 for Talent and Dynamics 365 for Retail, the last two applications also available separately as Dynamics 365 Plan.

The main advantage of Microsoft's cloud-based CRM is integration with other Office 365 applications, like Outlook online e-mail client, Yammer business social network, etc.

CRM COMPONENTS AND STRATEGY MODELS

CRM strategy models

CRM is a business strategy that has its philosophical basis in relationship marketing (Chen and Popovich, 2003), for which to succeed change of business processes towards customer-centric approach is required.

As long-term customers make more profit for the company, for complete loyalty customers have to be attracted to develop trust and confidence with the brand.

Introducing CRM into company business processes requires defining and implementing CRM strategy, meaning that company has to adapt business processes and services, train employees and implement CRM software. In order to implement CRM successfully, system users should be involved and expectations managed, business processes need to be changed as well as technology, with knowledge management and interaction management as two interconnected key processes (Kings and Burges, 2008).

There is a wide range of strategies for implementing CRM in a company (ChannelReply Blog, 2016; Kumar and Reinartz, 2012; Solitani and Navimipour, 2016), while many researchers studying relationships between buyers and sellers have proposed relationship development process models (Borys and Jemison, 1989; Heide, 1994; Wilson, 1995).

In this paper we propose a strategy based on Microsoft cloud implementation of CRM. Microsoft even provides FastTrack service *that can enable your customers smoothly and confidently make the move to Microsoft cloud services*, as cited on Microsoft FastTrack portal.

CRM components

Categorization of CRM components is generally accepted by researchers to consist of three major components:

- *Customer*, as the only source of the present profit and future company growth.
- *Relationship* between a company and its customers, which is bi-directional and can be short-term or long-term, continuous or discrete, attitudinal or behavioral.
- *Management*, since CRM is not limited to marketing department only, but involves corporate culture and processes change.

Customers, existing or new, as the only source of profit for a company, are usually attracted to make a purchase in a series of steps, as proposed by well-known “AIDA” model:

- *Attention*, the customer becomes aware of a product, service, brand or category, usually through some sort of marketing.
- *Interest*, the client becomes interested.
- *Desire*, the client develops a favorable attitude.
- *Action*, the client engages in purchasing.

But, AIDA model has its deficiencies, mainly due to the neglecting the post-purchase effects and behavioral intentions which may influence participation in online product review or other means of spreading out good or bad opinion about purchased goods. For this reason, many other models have been proposed, some of them including satisfaction or behavior as the last step, or even adding one or more steps before purchase, but AISDALSLove model proposed the highest number of steps (Wijaya, 2012):

Awareness → Interest → Search → Desire → Action → Like/dislike → Share → Love/hate

Of course, this is only in general theory, while in practice CRM implementation strategy and components may depend on the software solution, with more or less specialized components for different tasks. When comparing potential solution, not just components are taken into account, but some other categories of quality, too. For example, (Vugt and Knasys, 2017) used the following categories to assess and compare various CRM systems: Contact Management, Recruitment & Marketing, User Management, Ease of Use, and Help & Support, while Microsoft Dynamics 365 CRM has functionalities grouped into modules instead of traditional components, which are available to users depending on the licensing options. These modules are the following (Microsoft Dynamics 365 documentation, 2018): *Sales*, *Customer Service*, *Marketing*, *Field Service*, and *Gamification*, some of which will be described in Section 4.

Cloud solution is the right solution if company for many reasons given in (Vugt and Knasys, 2017), the most important ones being straightforward getting the system up and running as quickly as possible and low initial investment. On the other side, on-premise CRM solution has its advantages only in rare situations when significant investments into internal IT infrastructure has been made or very specialized data structures and strong customization is needed. A good example is Sustainalytics, Environmental, Social and Governance sustainability research and analysis specialist based in Amsterdam, which moved to Microsoft Dynamics 365 CRM, thus rationalizing what had previously been a disconnected set of customer information resources across a wide set of databases and email systems (Figure 3).

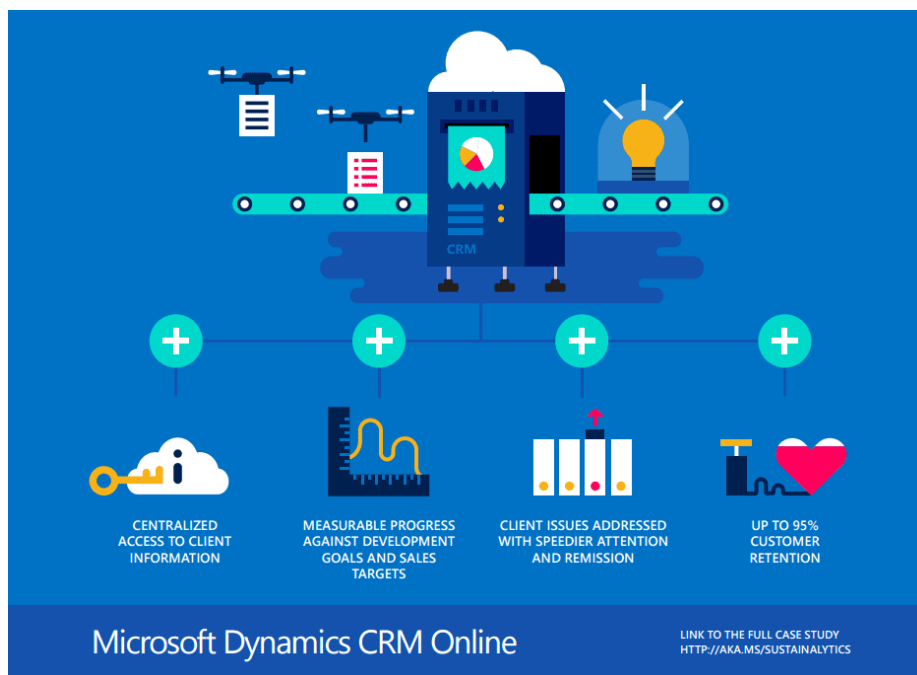


Figure 3: Systainalytics implementation of Microsoft Dynamics 365 CRM
 Source: <https://enterprise.microsoft.com/en-us/customer-story/industries/banking-and-capital-markets/sustainalytics-2/>

CLOUD-BASED SOLUTION FOR CONTEMPORARY CRM

Microsoft Dynamics 365 CRM (further: Dynamics 365) is designed to support marketing and sales process, from creating and tracking all activities of campaigns, from acquiring a new lead through the close of a sale. CRM has a place to store the contact information for new leads, a place to track the follow-up communications and the ability to qualify a Lead into an Account, Contact, and Opportunity (HCL, 2018).

Dynamics 365 reduces the gap between marketing and sales by providing visibility into each team’s efforts. Sales can see what is marketing doing to generate leads; marketing can see how effectively sales are following up on those leads (HCL, 2018). Dynamics 365 for Marketing allows creating campaigns to associate all the different elements of marketing efforts for a specific project. Figure 4 shows how Campaign record looks like.

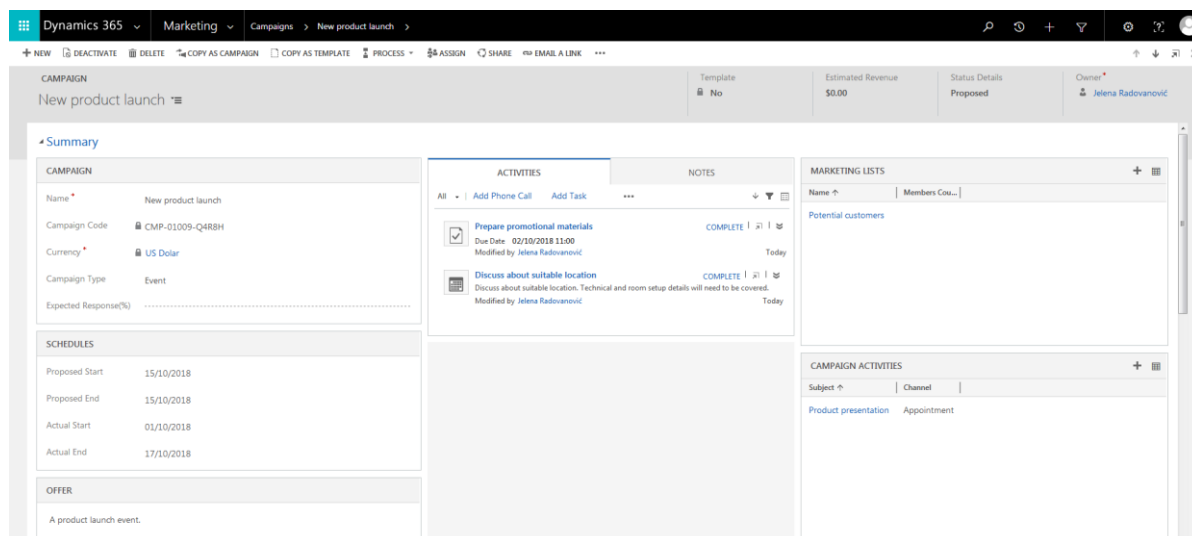


Figure 4: New Campaign – New product launch
 Source: Microsoft Dynamics 365 (screenshot)

On the left side of this window there is a section that holds some basic information about campaign: name, campaign type, currency (if company wants to track costs of the campaign, so that can determine return on investment for various marketing efforts), and proposed start and end dates. In the middle section of the window there is possibility to track campaign planning activities. Those are tasks that help company to organize and manage campaign, like appointments, e-mails, phone calls, tasks and more. In this example there is planned appointment to discuss about suitable location, since this campaign for launching new product is an event, and also a task to prepare promotional materials. While creating the appointment, there are options to record details like people required on the meeting, what is the topic, what is the duration and where the meeting is going to be realized. On the right side of the window there is a marketing list – a group of contacts that meet specific criteria and to whom all campaign activities are going to be distributed. Campaign activities are touch points to customers that are distributed. Those can be phone calls, appointments, emails or letters. In this example an appointment for the new product presentation is going to be made with members of marketing list associated with this activity, in this case all potential customers.

A lead represents any person or organization that a company might have the potential to do business with. Creating a Lead record of information about a new lead is often the first step users take in the sales process. Figure 5 shows how Lead record looks like.

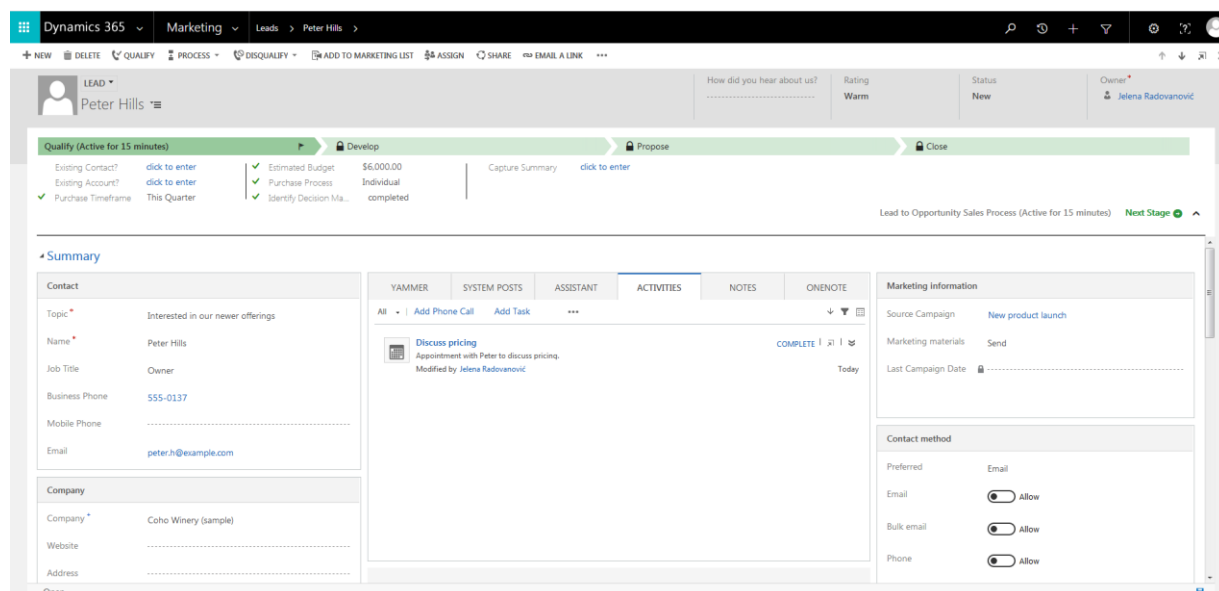


Figure 5: New Lead

Source: Microsoft Dynamics 365 (screenshot)

Lead contains information relevant to company's sales process and some basic information like how the lead was generated or what they might be interested in. In this example there is a new lead, Peter Hills, generated from the *New product launch* campaign, previously described. This lead is interested in new offer and an appointment to discuss pricing with him is going to be made. On the top of the window, there is possibility to Qualify a lead, which means to determine whether or not that lead is a good candidate for doing business with. After that, Lead will be converted into a Contact, Account, or Opportunity.

After searching all bussines that company in the example has with Coho Winery Account, results are shown as in Figure 6, and this window shows that Coho Winery is an Account and that there are Contacts, Leads and Opportunities conected with it.

When Opportunity listed as in Figure 6, window as in Figure 7 is displayed.

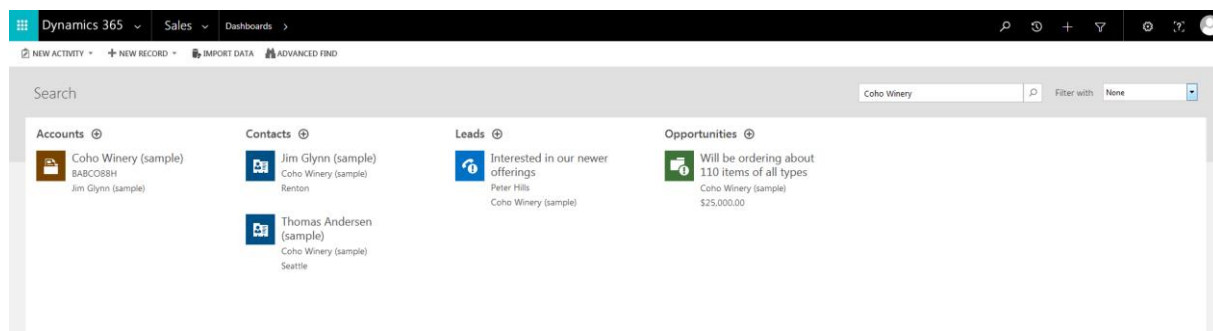


Figure 6: Search – Coho Winery

Source: Microsoft Dynamics 365 (screenshot)

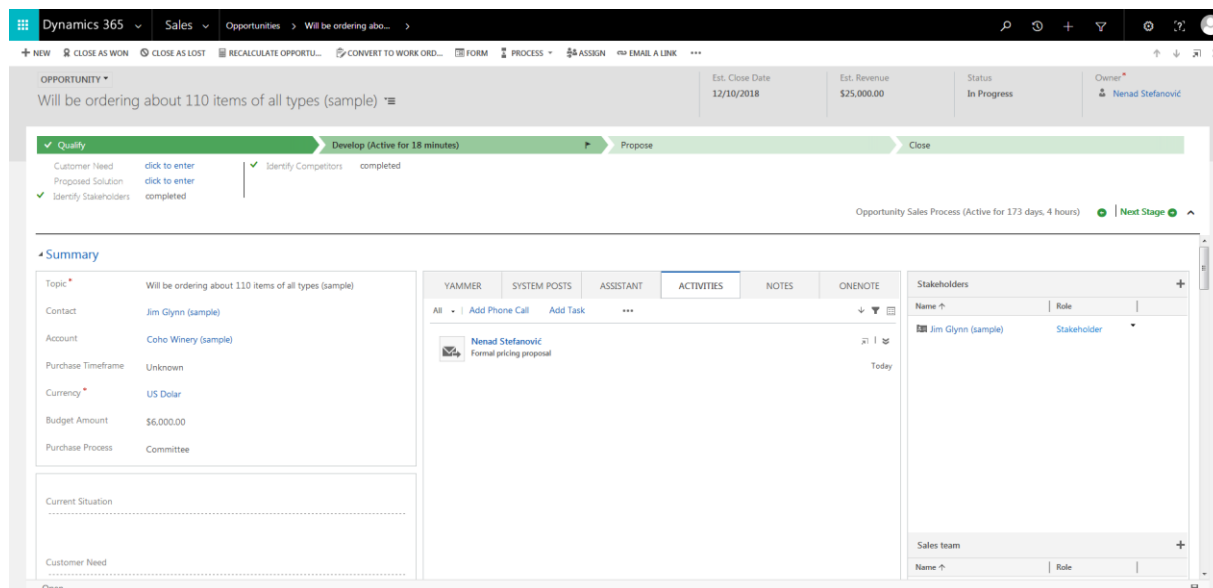


Figure 7: New Opportunity

Source: Microsoft Dynamics 365 (screenshot)

Opportunities in Dynamics 365 are the core record type in the sales process. Used by the sales team, opportunities represent a potential sale for a specific customer (HCL, 2018). This example shows that Coho Winery account will be ordering 110 items of all types, and that its contact Jim Glynn is waiting for a formal pricing proposal. After sending the proposal, the stage of this Opportunity can be moved on to the next stage of the sales process which is Propose.

Dynamics 365 offers a lot of benefits to sales people and sales managers, so that they can know which steps to take next to close deals faster, have all information in one central place and get productive faster.

CONCLUSION

This paper presents benefits of using CRM in business, especially cloud-based CRM, with one example of using Dynamics 365 CRM (as mentioned earlier, now Microsoft Dynamics 365 Customer Engagement), which is emerging as CRM platform of choice for many businesses today, as provided in the cited literature. As Microsoft provides significant discount to non-profit, especially educational institutions, Dynamics 365 is an excellent choice for such businesses as a complete online platform integrated with other Microsoft Office 365 service.

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DIGITAL DIVIDE ACROSS EUROPE. STATISTICAL ANALYSIS

Małgorzata Ćwiek¹

Abstract: *In the information society the quality of life, as well as the perspective of social change and economic development, are increasingly dependent on information and its use. Living standards, work and leisure patterns, are largely shaped by the modern technologies (Arendt 2009). Digital development takes place differently in particular countries. The aim of the article is to evaluate and decompose the digital inequality in the European Union. In order to make a comprehensive study of digital inequality the Digital Economy and Society Index (DESI) was used. It consists of five dimensions: Connectivity, Human Capital, Use of Internet Services, Integration of Digital Technology and Digital Public Services. The presented selection of variables allows the comparison of digital development countries, taking into account not only the situation of individual Internet users, but also the digital divide in businesses and the level of digitalisation of public services.*

The article provides the measures of location and dispersion of the studied index and its dimensions for Member States of the European Union. In order to extract the countries with similar levels of digital development analysis of agglomerates was used. Then, analysis of the digital divide across Europe was supplemented with the analysis of inequalities using Theil index, which allows an additive decomposition of existing inequalities. Decomposition of the Digital Economy and Society Index and its various dimensions is performed due to the previously separated concentrations.

The analysis showed that the Digital Economy and Society Index is characterized by considerable volatility. Among the studied dimensions, Connectivity was on the top middle level. This dimension is characterized by the lowest volatility. The most varied dimensions were values of the Integration of Digital Technology, which consists of, e.g., the percentage of enterprises that provide information about themselves on the Internet, the percentage of companies issuing electronic invoices, the proportion of small and mid-sized businesses selling online and the proportion of small and mid-sized selling online and cross-border. The conducted cluster analysis resulted in the separation of four groups of countries. Out of the extracted clusters, the greatest impact on the overall level of digital inequality was measured by using DESI, there is the group of states with the lowest level of development: Slovakia, Croatia, Hungary, Poland, Bulgaria, Romania, Italy and Greece. However, the biggest impact on inequality, Digital Economy and Society Index shows inequality between the clusters at more than 85%. The cluster generating the smallest inequalities both in the DESI index overall and its individual dimensions was the cluster of states with the highest level of digital development: Denmark, Sweden, the Netherlands and Finland. The largest share of generating inequalities in each of the dimensions of the DESI showed inequalities between the clusters, which confirms the legitimacy of the classification of Member States of the European Union due to the similarity of the achieved levels of development. should be from 350 to 500 words in length.

Keywords: *digital divide, digital development, information society*

JEL Classification: *D31, I31*

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INTRODUCTION

Intense communication and information-technologies (ICTs) development is causing radical changes covering the economic, social and cultural spheres. ICTs cause more and more people to gain the ability to actively participate in the creation, processing and transmitting information. This process is an opportunity to reduce the cost of access to knowledge and culture. Geographical distance ceases to have meaning in communication, making purchases, online banking or working remotely. The progressive digitization also has a huge impact on the functioning of enterprises and public administrations. Knowledge is a source of competitive advantage of today's business and the development of the company is carried out not by increasing production but by increasing market share. In terms of increasing digitization, the role of the state is to create the administrative and legal conditions friendly to institutional development of enterprises offering innovative products and services, including via the Internet.

On the other hand, the development of ICT can lead to an increase in inequalities in the development of individuals and entire societies (Cruz-Jesus et al. 2012) e.g. by excluding all those who do not internalize the required body of knowledge and skills required to use the new communications technologies from the productive areas of the new type of society.

The digital divide is often mentioned in the context of access to communication technologies: information and digital skills (Zhao et al. 2014). However, this approach does not exhaust the question of digital inequality of modern societies.

The aim of the article is to evaluate the digital inequality in the European Union. Some aspects of competitiveness, such as digital connectivity, human capital, use of the Internet, integration of digital technology and digital public services have been analyzed.

DIGITAL INEQUALITY - THEORETICAL BACKGROUND

Digital divide is the difference in access to modern technologies and in the use thereof between persons, households, entrepreneurs and geographic areas at different levels of socioeconomic development (OECD 2001). In individual terms, digital exclusion is usually considered in two respects: access to information and communication technologies and digital skills (Negreiro 2015). Access to broadband infrastructure and its quality is a precondition to use the opportunities offered by the Internet, not only for individuals and households, but also for enterprises and units of the state administration and local government. However, the mere fact of the potential availability of information, which access to the Internet gives, does not guarantee its actual availability, which is caused by the skills and competence of its audience (Torraco 2018, Wojniak 2013).

The digital divide issue also affects businesses. In the knowledge economy one of the main determinants of value creation in businesses is intellectual and social capital. The use of digital technology is a factor that can increase productivity, reduce costs and gain access to a wider range of customers and business partners. What is more, the Internet as a sales channel provides access to new markets and growth potential (Ruiz-Rodríguez et al. 2018, Arendt 2009).

Digital divide can also be considered in the context of digitalization of public services. The modernization and digitization of public services, particularly health and administration, can lead to an increase in efficiency and improve service availability (European Commission 2018, Helbig et al. 2009).

DATA AND RESEARCH METHOD

Comprehensive evaluation of digital inequality in the countries of the European Union requires the inclusion all of the above dimensions in the analysis. To this end, the analysis used the Digital

Economy and Society Index (DESI). DESI overall index is calculated as the weighted average of the five main dimensions: connectivity (25%), human capital (25%), use of the Internet (15%), the integration of digital technology (20%) and digital public services (15%) (<https://digital-agenda-data.eu/datasets/desi/indicators#desi-overall-index>). Indicators underlying the estimation of individual dimensions are presented in Table 1.

Table 1. Dimensions and indicators included in the Digital Economy and Society Index

Connectivity	Fixed Broadband Coverage (% households), Fixed Broadband Take-up (% households), 4G Coverage (% households (average of operators)), Mobile Broadband Take-up (subscriptions per 100 people), Fast Broadband (NGA) Coverage (% households covered by VDSL, FTTP or Docsis 3.0), Fast Broadband Take-up (% homes subscribing to >= 30Mbps), Ultrafast Broadband Coverage (% households covered by FTTP or Docsis 3.0), Ultrafast Broadband Take-up (% homes subscribing to >= 100Mbps), Broadband Price Index (Score (0 to 100)).
Human Capital	Internet Users (% individuals), At Least Basic Digital Skills (% individuals), ICT Specialists (% total employment), STEM Graduates (per 1000 individuals (aged 20-29))
Use of Internet Services	News (% individuals who used Internet in the last 3 months), Music (% individuals who used Internet in the last 3 months), Videos and Games (% individuals who used Internet in the last 3 months), Video on Demand (% individuals who used Internet in the last 3 months), Video Calls (% individuals who used Internet in the last 3 months), Social Networks (% individuals who used Internet in the last 3 months), Banking (% individuals who used Internet in the last 3 months), Shopping (% individuals who used Internet in the last 12 months).
Integration of Digital Technology	Electronic Information Sharing (% enterprises), RFID (% enterprises), Social Media (% enterprises), eInvoices (% enterprises), Cloud (% enterprises), SMEs Selling Online (% SMEs), E-commerce Turnover (% SME turnover), Selling Online Cross-border (% SMEs)
Digital Public Services	eGovernment Users (% internet users needing to submit forms), Pre-filled Forms (Score (0 to 100), Online Service Completion (Score (0 to 100))), Digital Public Services for Businesses (Score (0 to 100) - including domestic and cross-border), Open Data (% of maximum score), eHealth Services (% individuals)

Source: <https://digital-agenda-data.eu/datasets/desi/indicators#desi-overall-index>

In order to extract the countries with similar levels of digital development analysis of agglomerates was used. The grouping uses Euclidean distance and Ward's method (Panek & Zwierzchowski 2013). Analysis of the Digital Economy and Society Index and individual indicators was supplemented by the analysis of inequalities using Theil index in separate groups. Theil index (T) can be expressed using the following formula (Ulman et al. 2015):

$$T = \frac{1}{n} \sum_{i=1}^n \frac{y_i}{\bar{y}} \cdot \ln \frac{y_i}{\bar{y}},$$

where: \bar{y} – arithmetic average; n – the number of individuals surveyed. Theil index is characterized by additive decompositionality, allowing the decomposition of overall inequality due to the selected subgroups (Shorrocks 1980). At the same time it is possible to determine the influence of subgroup inequalities and disparities between the established groups in the formation of the general inequality (Ulman & Wałęga 2007).

DIGITAL DEVELOPMENT IN THE COUNTRIES OF THE EUROPEAN UNION

The value of the Digital Economy and Society Index for the European Union in 2018 year ranges from 73.7 for Denmark to 37.5 for Romania. Denmark owes its position in the DESI ranking to the highest performance in the Digital Technology and the Use of Internet Services. Interestingly, the dimension of Connectivity and Digital Public Services takes the 3rd place in the ranking, and the Human Capital - only 6. DESI histograms and its individual dimensions are presented in Figure 1.

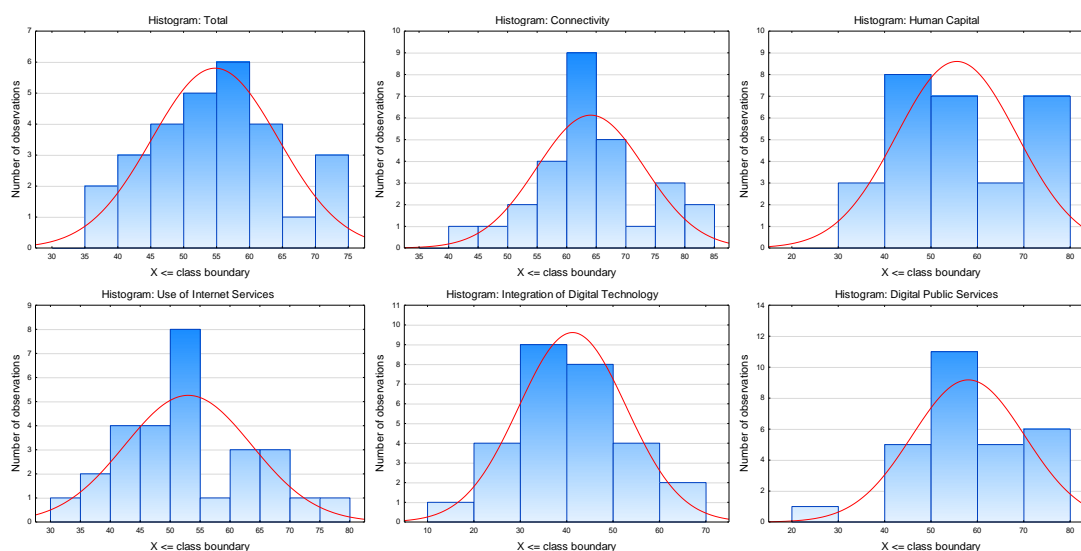


Figure 1. Histograms of DESI and its individual dimensions

Source: Author

The average DESI value for EU countries in the year 2018 was 54 (cf.. Table 2), which gives an increase of about 6% over the previous year and 10% in relation to 2016. Out of the dimensions included in the DESI, the highest average and the lowest diversity was showed by Connectivity. In contrast, the lowest average and the biggest differentiation was observed for the Integration of Digital Technology. In the year 2017, the biggest average increase happened in terms of the Integration of Digital Technology (9.26%), and the smallest one in Human Capital (3.67%). The growth for the rest of the dimensions varied from 6.03% to 7.08%.

Table 2. The characteristics of the digital inequality measurement in the European Union

Variable	N	Average	Median	Minimum	Maximum	Standard variation	Variability coefficient
Total	28	54.79	54.30	37.5	73.7	9.62	17.56
Connectivity	28	64.08	64.40	43.1	81.1	9.12	14.23
Human Capital	28	55.58	53.30	32.1	79.2	12.99	23.36
Use of Internet Services	28	53.03	52.50	35.0	75.1	10.62	20.03
Integration of Digital Technology	28	41.28	40.20	17.8	61.3	11.62	28.15
Digital Public Services	28	58.08	58.05	26.9	78.6	12.17	20.96

Source: Author

In terms of Connectivity in 2018, Netherlands was classified on the top position (81.1), obtaining the result that was 96.53% higher than the lowest-rated Greece (43.1). In terms of Human Capital the highest score was reached by Finland (79.2) and the lowest by Romania (32.1). The

dimension of the Use of Internet Services was rated the highest in Denmark (75.1) and the lowest in Romania (35.0). In the fourth dimension evaluated - Integration of Digital Technology Evaluation, Denmark (61.3) was 344.38%, while Romania received the lowest rank (17.8). However, in the dimension of the Digital Public Services the highest score was obtained by Finland (78.6), which is the result of 192.19% higher than Greece, weakest in this dimension (26.9).

DIGITAL INEQUALITY IN THE EUROPEAN UNION

For the purposes of classification of the countries of the European Union due to the dimensions of digital inequality analysis of agglomerates was applied. The results of the analysis were presented in Figure 2. A clear division into four clusters can be seen there. The first cluster connects the member states of moderate levels of development. The first group includes: Germany, Czech Republic, Austria, France, Slovenia, Portugal and Cyprus. Luxembourg, the United Kingdom, Ireland, Belgium, Estonia, Spain, Latvia, Lithuania and Malta create a cluster with a level of development slightly higher than the first cluster. Among the countries with the highest level of digital development were Denmark, Sweden, the Netherlands and Finland. Other countries (Slovakia, Croatia, Hungary, Poland, Bulgaria, Romania, Italy and Greece) should be regarded as the least developed in the area of digitalization.

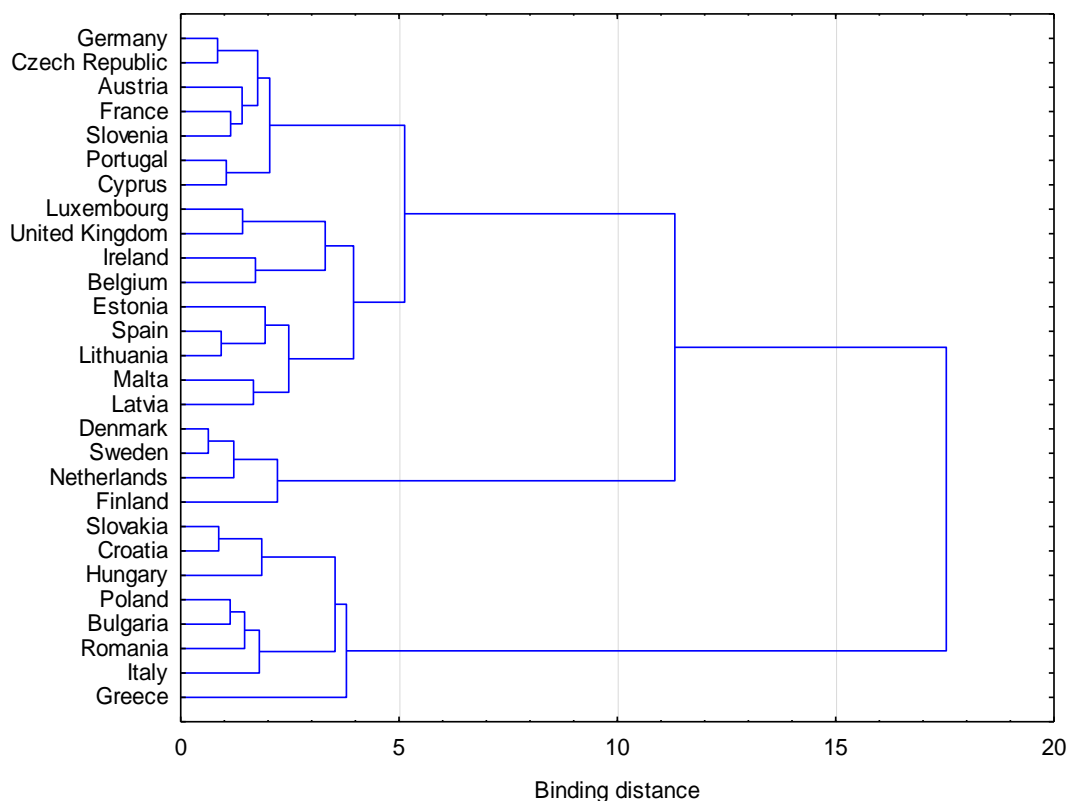


Figure 2. Results of grouping of Member States of the European Union due to the similarity of 5 dimensions forming DESI

Source: Author

As indicated in the previous section the digital development of EU Member States is characterized by large inequalities. In order to decompose the existing inequalities according to belonging to each cluster, Theil index was applied. As is apparent from Table 3, the Theil index values for each cluster are quite small and range from 0.0002 (concentration III) to 0.0042 (concentration IV). Focus IV has the greatest impact on the inequality index DESI - 6.38% of the total inequality between clusters result from inequalities within the fourth cluster. While the

third inequality in cluster three accounts for only 0.29% of the total inequality. By far the greatest impact on inequality in shaping the Digital Economy and Society Index have the inequalities singled out between the clusters.

Table 3. Inequalities and DESI values of EU Member States according to separate clusters

Group	N	Average	Theil index	The percentage impact of a given group on Theil index in total
I	7	53.19	0.0012	1.96
II	9	58.76	0.0017	3.92
III	4	71.03	0.0002	0.29
IV	8	43.61	0.0042	6.38
Total	28	54.79	0.0149	87.45*

* The percentage impact of inequalities between groups on Theil index in total

Source: Author

A similar analysis was performed for the dimensions of the DESI areas. Table 4 shows the percentage of the effect of irregularities in the individual clusters on inequalities in each dimension.

Table 4. The percentage impact of the separated clusters on Theil index in total for individual DESI dimensions

Group	Connectivity	Human Capital	Use of Internet Services	Integration of Digital Technology	Digital Public Services
I	1.86%	9.09%	2.84%	2.00%	4.73%
II	5.49%	18.38%	7.98%	23.03%	8.90%
III	2.58%	0.63%	1.77%	1.03%	0.79%
IV	6.79%	11.26%	16.27%	21.70%	16.19%
Total	83.28%*	60.64%*	71.14%*	52.24%*	69.39%*

* The percentage impact of inequalities between groups on Theil index in total

Source: Author

In all the examined dimensions of the digital development, the greatest impact on overall inequalities are the inequalities between clusters. In the case of the dimension of Digital Technology Integration, the inequalities between the groups are the smallest at 52.24%, while the largest intergroup inequality exists in the dimension of Connectivity - it is the cause of more than 80% percent of overall inequality.

In the first dimension (Connectivity) the greatest contribution to the overall inequality was the group of the least developed countries in the field of digitization (Slovakia, Croatia, Hungary, Poland, Bulgaria, Romania, Italy and Greece) - almost 7%, and the smallest - the first group (Germany, Czech Republic, Austria, France, Slovenia, Portugal and Cyprus). The second cluster included: Luxembourg, the United Kingdom, Ireland, Belgium, Estonia, Spain, Latvia, Lithuania and Malta - less than 2%.

In terms of Human Capital the largest impact on the general inequalities was the second cluster (Luxembourg, United Kingdom, Ireland, Belgium, Estonia, Spain, Latvia, Malta and Lithuania) – at more than 18%. Inequalities between the Member States with the highest level of digital development (Denmark, Sweden, the Netherlands and Finland) are the cause of less than 1% of the total inequality in terms of Human Capital. Very similar situation applies to dimension of Digital Public Services - here also cluster IV generated more than 16% of the total inequality and clusters I, II and III, 4.73, 8.90 and 0.79 percent, respectively.

In terms of the shaping of inequalities in terms of Use of Internet Services, the greatest impact had cluster IV (countries most affected by the digital divide) at more than 16%. The impact of other clusters on the formation of inequalities in this dimension was small - clusters I, II, and III, respectively generate just 2.84, 7.98 and 1.77 percent of total inequality.

The distribution of inequality in terms of the Integration of Digital Technology is interesting. In this case, the second and fourth clusters generated more than 20% of the total inequality and the first and third, a total of only 3%.

CONCLUSIONS AND RECOMMENDATIONS

The development of the information society is inseparable from digitalization. As the research shows, the value of the Digital Economy and Society Index in the countries of the European Union are characterized by a fairly large variation. The best situation and the smallest variation in the studied countries was shown by Connectivity, which means that the question of the availability of the Internet slowly ceases to be a problem in the European Union, although there are regions, especially in rural areas, with poor availability and insufficient speed of data transmission. In the face of good accessibility to the Internet, the problem of digital skills seems to be much more important. People with even very good equipment and high-quality Internet connection will not reap the benefits of access to the Internet if they do not have appropriate information skills, communication skills and problem solving skills. The greatest potential in the use of ICT is provided by programming skills. In the forefront of countries with high percentages of people with at least a good digital skills are Finland, the Netherlands and Sweden.

The problem of the digital divide of businesses is an equally important issue as the digital divide of individuals. This aspect of digital development in the European Union is the most diverse. The greatest inequalities in Integration of Digital Technology are generated by the states with the lowest level of digital development (Slovakia, Croatia, Hungary, Poland, Bulgaria, Romania, Italy and Greece).

The analysis of the digital development would be complete without the issues digitization of public services. The availability of these online services supports the digital development of companies and makes life easier for individuals. Finland, Estonia, Denmark, Spain, Sweden and the Netherlands were top rated in terms of digitization of public services.

To sum up, it should be stressed that the development and convergence of the European Union are not possible without growth and reduction of inequality in terms of digitalization of the Member States. For this reason, the issue of the digital divide should be constantly monitored.

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