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Ja sam Goran. Limar preser. Za to je potrebna sigurna ruka, preciznost i dobra volja. U Metalcu 17 godina Za mene je:

Sigurnost na prvom mestu

Zovem se Jelena. Moj posao je kontrola kvaliteta u završnoj obradi posuđa, a moj moto je

Osmeh!

Ja sam Dušica. Moj posao je poliranje proizvoda od granmatrixa. Kažu da su ženske ruke u ovom poslu maestralne. Pedantne smo i vidimo svaku sitnicu. Kad radim imam samo jedno merilo:

Neka sija kao sunce

Moje ime je Rajko. Već 12 godina sam u mašinskoj obradi lima. U životu sam sigurna u jedno:

Snaga je u čoveku

Zovem se David. Radim na automatima i robotima za zavarivanje bojlera.

Samo upornost rešava svaki problem

Moje ime je Milijan. Zovu me Žuti. Zavarivač sam već 33 godine, sada u pogonu bojlera. Znamo se i kad sam pod maskom. Moje pravilo u poslu je:

Biti tačan i odgovoran

Znamo se
We've been friends

metalac AD

since 1959

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After the program of fiscal consolidation ended successfully in 2018, the macroeconomic momentum in Serbia is significantly shifting. This edition of *Ekonomika preduzeća* addresses a spectrum of subjects in the new macroeconomic setting. In the *Introductory paper,* a trio of authors, *S. Popović-Pantić, D. Semenčenko* and *N. Vasilić,* acknowledges the impact of digital transformation on business performance. Of course, the idea of doing well in business by implementing digital transformation has proved to be a challenge, particularly in case of the women-owned companies. This involves equal measures of creativity and discipline, aspiration and practicality, including the balance between financial and social goals.

In the *Economic Growth and Development* section, a duo of authors, *O. Gavrić* and *Đ. Mitrović*, analyzes the impact of the green economy concept on the performance of EU economies by using four indicators that are relevant for the composite index, the Green Economy Development Index. The results are relevant for policymakers in Serbia who are in the stage of industrial policy formulation based on green economy and circular economy principles. In the second paper in this section, a trio of authors, *N. Tomić*, *V. Todorović* and *A. Pešterac,* measures the effects of Brexit on stock prices in the capital markets. The authors used parametric and non-parametric tests in three sectors (finance, technology and food). In the third paper in the *Economic Growth and Development* section, a trio of authors, *S. Ljajić, V. Kostić* and *M. Nikolić,* presents a benchmark analysis of small and medium-sized enterprises sector in Serbia and selected EU countries. This analysis is valuable in terms of making certain corrections in Serbia's current development strategy in the segment of small and medium-sized enterprises.

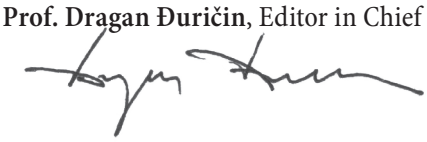
In the *Strategic Management* section, *Z. Aničić* presents results of an empirical analysis of intrapreneurship (or corporate entrepreneurship) and business performance based on a sample of 136 medium-sized and large enterprises operating in Serbia. It is an extremely delicate subject because business metrics are inherently imperfect, particularly when used to quantify intangible goals such as research and innovation as a proxy of corporate entrepreneurship.

In the *Accounting and Auditing* section, a trio of authors, *D. Rajin, M. Džunić* and *T. Radojević,* indicates the importance of compatibility of the accounting system and financial reporting in private and public sectors. The analysis is based on experiences of the developing countries.

In the *Marketing* section, a trio of authors, *M. Bakator, D.* Đorđević and *D.* Ćoćkalo, analyzes the impact of brand awareness on business performance and macroeconomy in Serbia, all based on a sample of 418 units.

In the *Tourism* section, a trio of authors, *J.* Šuleić, *A.* Đorđević and *B. Zečević,* offers an analysis of the impact of transportation services in package tours configuration based on a sample of 400 participants from Serbia's hospitality market. The analysis confirms that transportation service is a key success factor for package tours.

Prof. Dragan Đuričin, Editor in Chief



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THE INFLUENCE OF DIGITAL TRANSFORMATION ON BUSINESS PERFORMANCE: EVIDENCE OF THE WOMEN-OWNED COMPANIES*

Uticaj digitalne transformacije na poslovne performanse - Iskustvo iz firmi u ženskom vlasništvu

Abstract

Taking into account that female-owned companies are an emerging economic force, this paper is discussing the phenomena of digital transformation from the gender perspective. In the first part, we present the definition of digital transformation and overview of literature that was used. In addition to this, the stages of the digital transformation process are highlighted, as well as potential biases which companies could face, but also the benefits arising from the process of digital transformation and the tools used to identify the existing digital gap in companies. Furthermore, certain key characteristics of women-led businesses that we consider, at the same time, to be factors that enable faster digitization are presented. The third part is a discussion of the results obtained by statistical analysis. The paper uses a simple OLS regression analysis to test the impact of digital transformation on women-owned companies' performance, as well as a T-test of independent samples to identify potential differences in business indicators, depending on the number of years a company has been undergoing digital transformation. Research indicates that there is a positive impact of digital transformation on the performance of women-owned businesses. Also, it was confirmed that there is a significant difference in the level of product and service quality, product and service development capacity, productivity, and overall performance levels between enterprises undergoing digital transformation for less than two years and those who have been in the process for more than two years in favor of the latter. Finally, we summarize the findings of the research, concluding that digital transformation is a chance to improve the business performance of a group of businesses that are considered to have limited access to markets and sources of funding, such as women-owned businesses.

Keywords: *digitization, digitalization, digital transformation, women-owned companies, female entrepreneurship, business performance.*

Sažetak

Uzimajući u obzir da kompanije u vlasništvu žena predstavljaju ekonomsku silu u razvoju, u ovom radu biće razmatran fenomen digitalne transformacije iz rodne perspektive. U prvom delu rada predstavljena je definicija digitalne transformacije i pregled dosadašnjih istraživanja na ovu temu. Takođe, istaknute su faze procesa digitalne transformacije, potencijalne koristi i prepreke u ovom procesu, kao i alat za identifikovanje digitalnog gepa u kompaniji. U drugom delu predstavljene su neke ključne karakteristike ženskih kompanija za koje smatramo da su istovremeno i faktori koji omogućavaju efikasniju digitalnu transformaciju. Treći deo tiče se rezultata empirijskog istraživanja, dobijenih primenom odgovarajuće kvantitativne metodologije. U radu je korišćena prosta regresiona analiza za ispitivanje uticaja digitalne transformacije na performanse firmi u ženskom vlasništvu, kao i T-test nezavisnih uzoraka za identifikovanje potencijalnih razlika u indikatorima performansi u zavisnosti od broja godina koje je kompanija provela u procesu digitalne transformacije. Rezultati pokazuju da postoji pozitivan uticaj digitalne transformacije na performanse firmi u ženskom vlasništvu. Takođe, potvrđeno je da postoje signifikantne razlike u nivou kvaliteta proizvoda i usluga, kapaciteta za razvoj proizvoda i usluga,

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produktivnosti i ukupnih performansi između firmi koje su u procesu digitalne transformacije manje od dve godine i firmi koje su duže od dve godine u ovom procesu, u korist firmi iz druge grupe. Na kraju, sumiramo nalaze istraživanja, zaključujući da je digitalna transformacija šansa za poboljšanje poslovnih performansi grupe preduzeća za koja se smatra da imaju ograničen pristup tržištima i izvorima finansiranja, kao što su preduzeća u vlasništvu žena.

Ključne reči: *digitizacija, digitalizacija, digitalna transformacija, kompanije u ženskom vlasništvu, žensko preduzetništvo, poslovne performanse.*

Introduction

The accelerated development of digital technologies, as one of the main features of the 21st century, has made the business environment much more turbulent and unpredictable, where not only prosperity but also the continuation of the enterprise is rather uncertain. Any business in such conditions needs to be flexible and adaptable to keep up with everyday changes in order to survive, and also to use the changes caused by the rapid development of technology as a chance for progress. All of this, combined with problems of the contemporary business environment such as lack of resources, tougher competition and increasing customer awareness, calls for a rethinking of the current business philosophy and ways of communicating and cooperating with key stakeholders. The rapid development and penetration of digital technologies in all segments of society has led many businesses to think and actively explore the methods by which digital technologies can be exploited productively to raise the quality of all aspects of business. The concept of digital transformation is emerging not as one of the possible solutions, but as a prerequisite for companies striving for business excellence and expansion.

Digital technology is central for designing a new and more competitive business model. However, digital technology alone is not enough to help an enterprise improve its market position and business performance. It requires constant, adequately guided and directed integral use of modern digital technologies in the activities of changing products, processes, organizational structure, organizational culture, in the business model as a whole, focusing on the optimal satisfaction of the consumer needs. These characteristics form the basic idea of the concept of digital transformation. In the last two decades, the concept of digital transformation has received considerable attention in the academia, but only in recent years the implementation of this concept has become effective in commercial practice. Digital transformation is a global phenomenon that economic policymakers, businessmen, the intellectual elite speak about every day. It is a term that is increasingly being prioritized due to the fact that it is a global trend, but also because of the real advantages and opportunities that this concept brings to the entire society. A review of the literature addressing the topic of digital transformation has revealed that there is no generally accepted, uniform and comprehensive definition of the term digital transformation. In addition, it is often heard in public appearances and read in the press or in scientific publications that the terms digitalization and digitization are used as synonyms for digital transformation. Fitzgerald, Kruschwitz, Bonnet and Welch [13] define digital transformation as the use of modern digital technologies (mobile devices, analytics devices, social media, etc.) in the process of improving the experience of users of products and services, simplifying operational business activities and transforming the traditional business model. Martin [31] believes that digital transformation signifies the use of information and communication technologies, which is not a function of trivial automation, but contributes to enhancing the existing ones, and also to creating new capabilities in business and people's lives. According to Collin et al. [7] and Kane, Palmer, Phillips, Kiron and Buckley [25], digital transformation and digitalization are terms used interchangeably to describe a concept that influences policy, business and other important social issues. In the paper of Schwer, Hitz, Wyss, Wirz and Minonne [40], the literature review begins with the sentence: "Digitalization, also called digital transformation,…" Foerster-Metz, Marquardt, Golowko, Kompalla and Hell [14] and Hausberg, Liere-Netheler, Packmohr, Pakura and Vogelsang [20] use digitalization and digitization as synonyms for digital transformation. Some authors make a distinction between digitization, digitalization, and digital transformation. Digitalization, as an application of digital technologies, precedes digital transformation, which

is an endless process [12]. Kwon and Park [28] consider that digital transformation also involves digitalization, but that there is a certain difference between the two concepts. Digital transformation means the conversion of analogue information to digital or process automation using ICT, which will initiate changes in the business model, organizational structure, products, processes and other aspects of business. Osmundsen, Iden and Bendik [35] point out that digital transformation is a consequence of continuous digitalization and digital innovation over time, which will lead to transformation of the company or the entire industry. For Matt, Hess and Benlian [32], digitalization manifests itself in the form of integration of digital technologies, thus making things digital, while digital transformation also implies changes in products, processes, organizational structure and management concepts. Savić [37] points out that there are differences between digitization, digitalization and digital transformation in terms of focus, goals, activities, tools and challenges. Digitization refers to the creation of a digital representation of an object that has a material form [37], that is, the conversion of analogue into digital information [9]. For example, scanning the invoice and saving it as a digital document. Digitization by itself is of no value, but it provides the basis for those activities that require the use of digital data, which ultimately has the effect of creating a new value. Digitalization is a broader category, which includes digitization. Transforming and improving a business using digital technologies and digital data is called digitalization. Unlike digitization, digitalization involves the automation of business processes and operations, as well as the processing of information [37]. Receiving and processing digital invoices in appropriate software is an example of digitization. However, Savić [37] emphasizes that digitalization does not result in digital transformation. Digital transformation means that things are done differently, creating a whole new business model based on modern digital technologies. Specifically, digital transformation signifies the use of existing knowledge in order to make radical changes in the organization, so that all activities and decisions that are made are customer-focused. Simply put, digital transformation means that in the company "Everything is electronic, from registration to content delivery" [37] in order to increase the level of customer satisfaction. According to Bockshecker, Hackstein and Baumol [4], the term digitization is linked to changes in the technical system, while digitalization encompasses changes in both the social and technical system of the organization [4], [29], from which it can be concluded that digitization is an integral part of digitalization. Digital transformation is a more comprehensive category than the previous two, and it is interpreted as a process that enables organizations to fully embrace social and technical change. In fact, digital transformation is a complex and ongoing process of profound change across all segments of the organization, which should contribute to enhancing the capacity to absorb new technologies almost immediately, thereby significantly enhancing the technical and social elements of the business. Apparently, digitization, digitalization, and digital transformation are three completely different concepts in their complexity, content, activities and goals, and that is why the authors of future research in this field should be cautious when using these terms, which has not been the case so far.

Although it results in radical changes, it should be emphasized that the digital transformation process is of an evolutionary character, starting from equipping workplaces and all parts of the organization with digital technologies, through the digitalization of the back-end and front-end processes, to creating a new business model, which enables integration into the digital ecosystem, an extensive network of participants trying to deliver the best quality through collaboration. However, this does not mean that the digital transformation ends the moment when the current way of doing business has been radically changed. Digital transformation is a continuous process of change within the company and in relationships with stakeholders, which will last as long as new technologies emerge, since it requires the company to constantly monitor the emergence of new digital technologies and incorporate them into its operations, putting them in the function of day-to-day operations. That is why it is important for the concept of digital transformation to become the kind of model that businesses will follow, because only this way can they survive in a strong competitive game and improve their performance.

So far, research looking into the field of digital transformation has been largely descriptive. The authors have been concerned with identifying differences between the concepts of digitization, digitalization and digital transformation [37], [4], defining and analyzing a digital transformation strategy [25], [32] and the role of chief digital officer in this process [45], [22], assessing digital maturity, and thus the willingness to continue the digital transformation process [48], [47], the digital transformation of the business model [39], [27], and assumptions about the potential effects of digital transformation on business operations [13], [24], [34]. In Serbia, Pitić, Savić and Verbić [36] address the country-wide digital transformation strategy. There is a lack of empirical research in this area which would enable reliable verification of theoretical assumptions that were developed so far, which is a significant gap that will be covered to some extent by this research. However, the influence of digital transformation on the business performance of the companies managed and owned by women has been even less discussed in the literature and practice. The authors have decided to analyze digital transformation from a gender perspective because this particular group of enterprises seems to have an increasing contribution to GDP. The European Commission [10] recognizes that "policies to promote gender equality will be needed to increase labor force participation thus adding to growth and social cohesion".

However, the findings of the European studies warn continuously that the share of women in STEM is underrepresented. Furthermore, "figures indicate that women's participation in the ICT and digital sector does not improve significantly comparing to 2011 survey. If the existing biases are not addressed, rapid economic advances achieved by digital transformation will not take into account the existing gender gap in the sector" [23]. However, digital transformation is a considerable opportunity to boost female entrepreneurs and therefore, the focus of the paper is to analyze the current position of female entrepreneurship in Serbia regarding digital transformation. Our interest for this target group and its behavior in the process of digital transformation comes from the fact that certain research into female entrepreneurship in Serbia indicates that women-owned companies with increasing profit place a significantly higher importance to catching up with new technologies [41]. Also, it seems that, unlike the female students in the EU, the share of Serbian female students who graduated in STEM is quite higher, amounting almost to half of the total graduates – 45% [42]. Having in mind such encouraging data, this paper explores the influence of digital transformation on the performance of Serbian women-owned companies in order to learn if there is significant influence of the current level of digital transformation on the women-owned companies' performance.

According to the abovementioned aspects of digital transformation, and considering the context of this research, we will define digital transformation as follows: Digital transformation is a complex, dynamic, continuous and in the digital era necessary process of reforming all organizational aspects, supported by a strategically designed integral application of modern digital technologies, which should result in the creation of a new business model and putting the customer at the center of all actions and decisions that the company makes, all with the aim of creating conditions for enhancing innovation, better positioning in the market, and thus improving overall business results.

Characteristics and potential implications of the digital transformation process

Digital transformation is manifested in the form of continuous improvement of the existing and rapid absorption of new technologies, which will be put into function to affect all activities in the company. The constant emergence of new and powerful digital technologies enables the continuity of the digital transformation process. Therefore, when asked what is the main driver of digital transformation, many of us would probably mention technology as the core engine of this process. However, we would be wrong. Digital technologies (social, mobile, analytics, cloud) are important, but their strength and power is not in their individual use, but in whether the company has the knowledge to transform itself and its business through the integrated application of digital technologies. A well-thought-out digital transformation strategy is

something that initiates and is the basis for success in a company's digital transformation process. The strength of the digital transformation strategy lies in its goals and aspects that will be the focus of the process. From a business perspective, the digital transformation strategy aims to transform products, processes and organizational aspects by using digital technologies. In connection with this, it is necessary to emphasize that this strategy is trans-functional (cross-functional), because it affects all activities and functions in the enterprise. This fact requires the conception of a new, meta strategy, called digital business strategy, which would incorporate under its roof the digital transformation strategy, functional and operational strategies of the company. The importance of the digital strategy is also reflected in the results of a study conducted in collaboration with the MIT Sloan Management Review and Delloite Company. Specifically, this study shows that 15% of the respondents from the early-stage digital companies believe that their company has a clear, coherent and comprehensive digital strategy, while this percentage exceeds 80% among companies positioned in the higher stages of digital maturity [25].

The success of the management and employees in designing a high-quality digital business strategy, as well as its implementation, greatly influences the current level of digital maturity of the company. Digital maturity reflects the level or stage of the digital transformation the company is currently in, as well as the existing digital gaps that will pave the way for the company to continue this process. Digitally mature are those companies where the business process automation is at the highest level, so there is no repetition of work, operating costs are minimal and can be easily planned and predicted, there is a logical sequence and correlation between business functions, so that the output of one function is used as input in another function, contacts with all stakeholders are automated, the risk of human error is minimized, work is done in a reliable company information system etc. Digitally mature companies are focused on the integrated application of modern digital technologies in changing the way they do business, as opposed to less digitally mature companies, which seek to solve individual problems encountered in business through individual digital technologies.

Although many point out to the radical character of digital transformation, it should be mentioned that it is a phased, evolutionary process, in which each phase must be fully completed in order to succeed in the next one. According to Chalons and Dufft [6], digital transformation consists of three phases. In the first phase, it is necessary to equip workplaces with smartphones, tablets and other mobile devices, as well as collaboration tools such as video conferencing and chat. This phase is best described by the term consumerization, which implies a change in technology in a business under the influence of technologies originally intended for the consumer market but which, because of their different opportunities and options, find their place in the business world, as well. In the second phase, as Chalons and Dufft [6] point out, the focus shifts from employees to consumers. The goal is for the consumer to experience the optimal digital experience, which is why the emphasis must be on comprehensive digital transformation. This means that digital transformation must be equally carried out on the processes directly confronted by the consumer, such as marketing, sales, customer support, but also on back-end processes that are not visible to consumers and which have an equal impact on their experience in company relations (accounting, warehousing, logistics, etc.). The last, third phase, embraces new sales models, products and a whole new business model, all of which results in a new digital ecosystem [6]. Namely, the concept of the digital ecosystem is especially important in the conditions of globalization where, as a result, there is an increased competition and inability of many companies to withstand and survive in such conditions. By pooling the strengths of actors from different sectors, while sharing the necessary information, there is a chance to offer consumers better options compared to their competitors whereas, in return, the overall value that companies are appropriating is increased.

The dynamics of the digital transformation process and thus the level of digital maturity varies from one company to another. There are a number of obstacles companies face while trying to be effective in this process. The system of values, assumptions and beliefs shared by the employees of a company greatly influences not only the success, but also the decision to initiate the

digital transformation process. Important features of an organizational culture that would benefit from digital transformation are innovation, trust, collaboration, risk appetite, and tolerance in case of failure [19]. Lack of knowledge about digital technologies and their application capabilities can make it difficult to manage the digital transformation process. That is why it is important for an organization to hire an expert or to appoint one of its existing employees to the position of chief information officer. Employees are often inclined to have a deep aversion even to minor changes, and especially when it comes to the radical, big changes that digital transformation brings. For this reason, a new chief digital officer function is emerging in organizations, and their main task is to direct and actively engage employees whose jobs and workplaces are affected by the digital transformation process, which should alleviate resistance to change and thus ensure full digital transformation capacity. Apart from that, SMEs in particular have additional difficulties, which are slowing down the digital transformation process. An aggravating circumstance for the SMEs, compared to large firms, may be the lack of high-quality people in management positions and limited financial resources, and in particular the propensity of the SMEs to adopt dynamic, informal, non-proactive strategies [16].

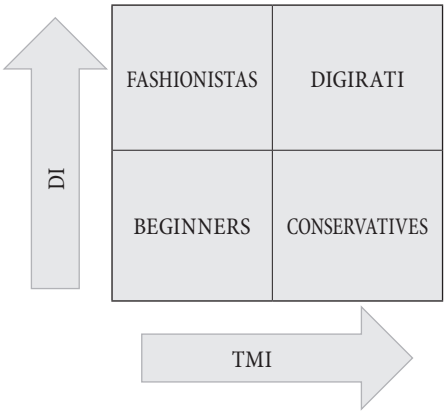
The concept of digital transformation has gained in popularity in the recent years as a subject of research in numerous scientific publications, but above all with a focus on the theoretical explanation of the concept, characteristics, strategies and possible implications of this phenomenon. The authors generally predict and assume on a logical basis what implications a digital transformation would have on the enterprise itself, on its innovation, organizational structure, processes and overall business performance, but in most cases without any empirical verification of theoretical assumptions.

The intensive use of fast-growing digital technologies is a major mean of reducing costs, increasing the efficiency and effectiveness of business processes, increasing customer satisfaction through overall collaboration with the company, thereby enhancing the market position and competitive power of the company [13], [1]. Companies that have undergone intense digital transformation are rapidly reaching a high level of digital maturity, thus becoming more able to use their digital technologies more efficiently and productively to improve their performance [34] and to occupy a leading position in the market. Also, by applying an integrated digital strategy, such companies can improve business processes and perform modularization more easily, which further strengthens their capacity to adopt and implement new business practices and initiate innovation. Organizations that use digital technologies in order to initiate changes, enhance business processes and operations are much more innovative [34] compared to those which do not behave according to the postulates of the digital era. Kagermann [24] concludes that digital transformation drives innovation and change, regardless of the type of industry, due to the increasing approximation of the real and virtual worlds. Originally conceived of the business philosophy and logic underlying the business of the company from its inception, it will experience some form of modification or complete restructuring through the digital transformation process, creating the conditions for the development and commercialization of new products and services [44]. The implementation of new digital technology incites growth of company productivity through appropriate improvements and changes in the production process [15]. According to Urbach and Ahlemann [46], digital transformation means the use of technological innovations in business with the intention to increase productivity, sales and establish new forms of cooperation with customers.

All of these authors conclude that digital transformation will significantly improve a company's business through increasing innovation, productivity, streamlining business operations, stimulating consumer satisfaction, etc. Generally speaking, it is true. But whether and to what extent digital transformation provides an improvement in business performance depends largely on the current stage of digital transformation in which businesses are positioned. In order to prove that not all companies have the same level of benefit from digital transformation, Westerman, Tannou, Bonnet, Ferraris and McAfee [47] developed a digital maturity assessment model. The model itself is a combination of two dimensions: digital intensity and transformation management intensity (Figure 1), based

on which the company falls into one of four categories: beginners, fashionistas, conservatives and digirati. The categories below indicate the stage of digital transformation the company is currently in according to the estimated level of digital intensity (DI) and transformation management intensity (TMI)[1].

Figure 1: Matrix of digital maturity



Source: Adapted according to [47].

Beginners are companies that have just started out their digital transformation or are still not aware of the consequences of low DI and low TMI. Companies that use different digital technologies but lack the vision, unity and knowledge of how to integrate and deploy them to achieve a synergistic effect are called fashionistas (high DI and low TMI). Conservatives, on the other hand, are characterized by a thorough, stable and slow approach based on cultural uniformization and effective management, but with a high dose of skepticism towards modern technologies (low DI and high TMI). The most advanced digital transformation companies are concentrated in the last quarter of the quadrant, the digirati, and are known as the digital elite (high DI and high TMI). They have a comprehensive digital strategy that combines vision, a strong digital culture and willingness to adopt current and upcoming digital technologies

The developed model was implemented in practice on a sample of 184 companies in the USA, to test the effects of current digital maturity levels on business performance [47]. The results of the study show that conservatives and fashionistas perform better than the beginners, digging far ahead of all other companies. The authors used the following as indicators of business success: the amount of income, profitability and market value. The digirati had a 9% increase in revenue compared to the average fashionistas or conservative companies [47]. The results also show that companies with low TMIs, regardless of the DI (beginners or fashionistas) levels, achieve a significantly lower level of profitability compared to companies with high TMIs and independently of the DI levels (conservatives or digirati). The digirati and digital conservatives are 26% and 9% more profitable, respectively, than the other two categories of companies [47]. Companies with high levels of TMI (digirati and conservatives) also have a higher market value than other companies. Of course, companies that are capable of recognizing, adopting and implementing current digital technologies are the most successful, with a clear, strategic vision, cultural uniformity and active involvement of employees at all levels of the organization in the digital transformation process.

Some current characteristics of female entrepreneurship – Do they differ from the male?

Female entrepreneurship contributes significantly to economic growth and poverty reduction not only in less developed economies, but also in economically developed countries. In addition to their contribution to the growth of employment, female entrepreneurship improves diversification of jobs through different innovation processes, different management and marketing practices. In the EU countries, the average number of women-owned enterprises is around 30%, as is in Serbia. However, in the United States, women own about 40% of SMEs. Although it is an upward trend regarding percentage of female entrepreneurs, there are still plenty of facts which put this economic group in a less favorable positions than men.

There are specific difficulties, including accessing finances, which women face when it comes to establishing and running a business. Other barriers include (1) lack

1 The digital maturity rating is performed over 10 statements, 5 statements for DI estimation and 5 for TMI estimation, on a scale of 1 to 7. The minimum value that can be achieved at the DI and TMI level is 10, and the maximum is 70. Ranking is performed in a way so that companies that have earned between 10 and 40 points for both DI and TMI are ranked as low digital maturity companies. Companies that have earned more than 41 points for both dimensions are categorized as high digital maturity companies [48].

of role models, (2) entrenched stereotypes, (3) weaker business networks, (4) stronger perceived difficulties for reconciling business and personal life, and (5) gender differences in the sector of activity. Fear to fail seems to be an important socio-cultural factor influencing both genders, but women to a greater extent [3].

The starting point of our research (and a hypothesis approved in a number of papers so far) is that there are certain differences between men and women who are doing business, and accordingly also differences in the digital transformation of enterprises. What characterizes the differences between men and women doing business? In fact, networking is a way to enhance business expertise, get support regarding access to funds, establish suitable partnerships or find qualified employees, among other things. 93% of female entrepreneurs think that business networks are essential for their professional development.

The number of women who use entrepreneurial workshops/support meetings is higher compared to their male counterparts, 55% vs. 44%. Men prefer incubators, mentoring programs or initiatives to workshops and meetings. Family obligations and responsibilities related to children and caring for the elderly are important factors associated with the number of female entrepreneurs.

Female businesses tend to be smaller and with lower loans and initial capital levels, which usually implies lower returns for equity and debt financiers. In general, most women start new businesses in sectors that are traditionally female-dominated and which seem to be less attractive and profitable for private investors. Women prefer to set up their business in specific industries, particularly in the health care, social care or the education sector. The sectors where women prefer to set up businesses tend to be considered by investors as less profitable, which in turn influences the capacity of women to raise funds [3].

Digital transformation and female entrepreneurship in the European Union

A study conducted in 2018 on the participation of women in ICT in the EU (and some other countries, among them a few respondents from Serbia, as well) and its dynamics and analyses of the practices enabling women's participation in the digital world, stated in the final conclusion that "although 57% of tertiary graduates in the EU are women, only 24.9% of them graduate in ICT-related fields, and very few enter the sector" [23]. Furthermore, figures indicate that women's participation in the ICT and digital sector has not improved significantly compared to the survey published in 2011. If the existing biases are not addressed, rapid economic advances achieved by digital transformation will not take into account the existing gender gap in the sector which will simply amplify and, possibly, perpetuate gender stereotypes [23].

Data trends and qualitative analysis suggest that gender inequality in the digital sphere exists. Differences in the personal preferences that men and women have regarding technology have generally been considered as a factor influencing their educational and professional choices, and partially explains the lack of women in STEM studies and ICT careers. Gender differences are not visible only in career options but also in citizens' attitudes towards technology and innovation. A recent Eurobarometer survey asked Europeans about their perceptions of the impact of digital technologies on their lives. The results show the existence of differences based on gender. Women have a more negative view of the impact of digital technologies in all spheres, particularly in their quality of life [11].

The digital economy contributes with up to 8% to GDP in the G20 countries (in Serbia with 6% [26]) and shows an upward-growing trend.

Digital transformation is a considerable opportunity to boost female entrepreneurs, particularly for the younger generations which have grown up in close interaction with digital technologies. Focused on the high-technology industry in Europe, almost half of the start-ups nowadays belong to the digital economy: 48.9% of start-ups are related to innovative technologies and/or business models. Nevertheless, out of the 2,515 start-ups and 6,340 founders analyzed by the 2nd European Start-up Monitor, only 14.8% of the founders were female, which is an increment of 0.1 percentage points in comparison to 2015 [23].

In 2015, the Female Entrepreneurship Index [30] analyzed the situation of female entrepreneurs in a total of 77 countries and scored them from 0 to 100. They did this in accordance with an evaluation of factors

related to entrepreneurial environment, ecosystem and aspirations in order to identify those factors that boost high potential for female entrepreneurs. Six countries in the European Union are among the top ten when it comes to female entrepreneurs: the UK, Denmark, the Netherlands, France, Sweden and Finland. Serbia was not included in this survey due to the lack of accurate official statistical data. All of the EU countries involved in the study were ranked among the top forty positions. The evidence suggests that the European countries (included in the survey) have a stimulating environment to boost female entrepreneurship and consequently, a higher share of them in the total number of SMEs. Their findings for the European region in particular have pointed out to high levels of education and access to learning programs for women to improve business skills through SME support and training. Conversely, findings also show that self-perception of females on their start-up knowledge and skills, as well as the identification of good opportunities to start a business in Europe, were identified as points that need to be improved. But, similar to the U.S. survey, female entrepreneurs in the EU encounter their most prominent challenge in accessing funding. These weaknesses might explain the scarce number of new businesses. According to the Global Entrepreneurship Monitor [21], Europe in 2016 recorded not only the lowest female involvement in early-stage activity of all the regions analyzed (6%), but also the lowest gender parity. Furthermore, it stated that European women were half as likely to be engaged in the total early-stage entrepreneurial activity (TEA) as men.

Some demographic characteristics of female entrepreneurs in Serbia relevant to the survey on digital transformation

Before we present the analysis stemming from our research, it will be reasonable to become more familiar with demographic characteristics of female entrepreneurs in Serbia. In 2014, we conducted a survey with a purpose to investigate the need for training (TNA) in Serbian women-owned firms. The research was conducted on a representative sample of 203 female entrepreneurs from Serbia, which provided a fairly reliable picture of the demographic characteristics of women's entrepreneurship in Serbia [41].

The size of enterprises from the sample corresponds to the general indicators of women's entrepreneurship in Serbia when it comes to SMEs [2], namely a maximum of 65% of companies are in the micro category (1-9 employees), 25% are small (10-49), and 10.3% medium-sized. The majority of women entrepreneurs from Serbia participating in the survey (77%) hold a university diploma and/or a master's degree and a PhD, which is approximately the case in the entire sample in South-East Europe – 72.2%, while 49% of the respondents hold a secondary education degree.

The largest number of survey participants is at the age group of 35-39 and/or 45-49. Women in the category of 55+ years are engaged in the manufacturing industry (17%), sales and trading (14%), professional and other service activities (11%) and the health care sector (11%). On the other hand, young women entrepreneurs are active in sales and trade (22%), professional and other service activities (15%), arts, entertainment and recreation (13%) and manufacturing (12%). Women under 29 years of age made up the smallest share in the whole sample, and almost with the same percentage were women over the age of 60.

Serbian female entrepreneurs started their businesses in order to become independent (36%) or to take advantage of the business benefits (30%). This data is in conformity with the data for the total SEE sample where 33% of women started their own business in order to become independent, while 27% wanted to take advantage of the business benefits.

61% of female entrepreneurs estimated that the state of their business is good, and only 6% of them barely survives. There is no significant difference compared to the assessment which is given by men about their businesses' performance in another survey on TNA with a mixed gender sample [41].

Only 25% of women entrepreneurs were trained for start-ups before entering the entrepreneurial world. Women entrepreneurs which organized some kind of training for their employees did it by combining their internal resources (employees with specific skills) and paid services – training, consultants, seminars and other.

The most important reasons for undertaking training are: 1. increasing the quality of services and products, 2. expanding the business, 3. keeping up with new technologies and trends**.** Organizers of the training that they opt for are usually private consultants. Only 12% of SMEs in Serbia have an annual budget dedicated to training with an average amount of 9.9% of the total revenue. As many as 79% of companies in Serbia fund training from their own resources. This is probably why they have kept investment in human resource development at the same level for the last three years.

Results showed that there are significant differences in the reasons for organizing training between firms with an increasing profit trend and the firms whose profit is without changes. Companies with an increasing profit trend place a significantly higher importance to virtually all the reasons for organizing training: 1. staying in business, 2. catching up with new technologies, 3. expanding the business, 4. increasing the quality of services or product, 5. improving the company's image, and 6. improving the skills of new employees.

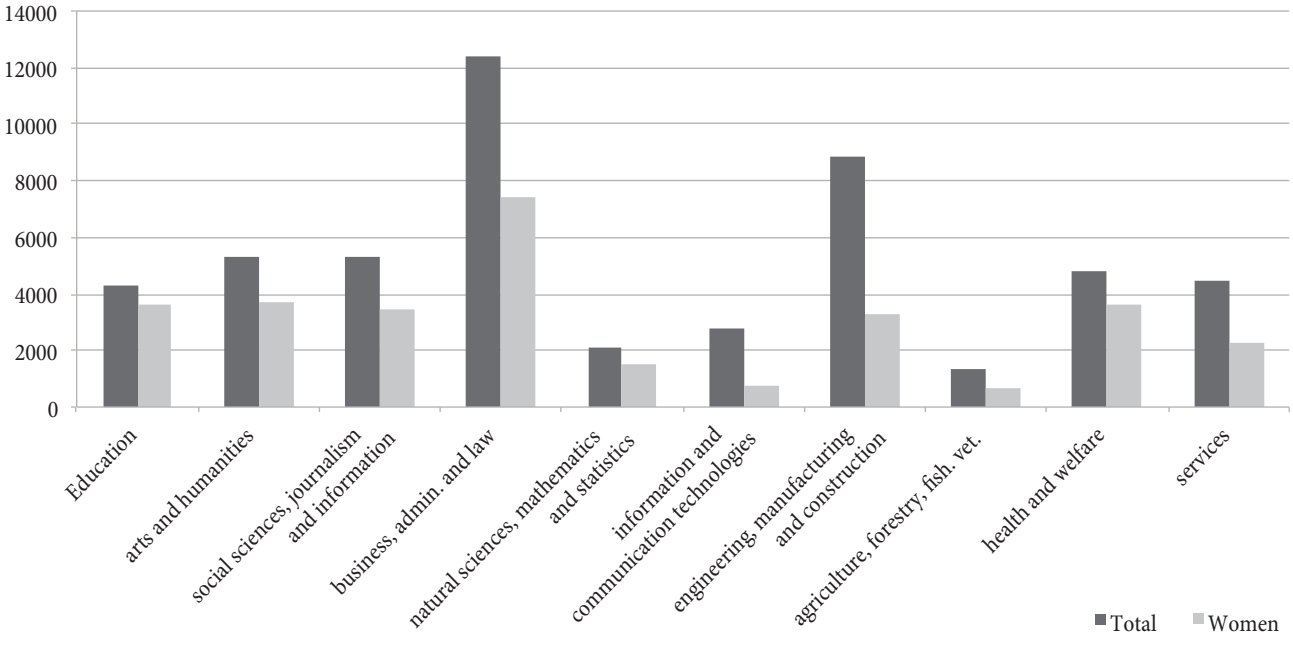
If we add that 58% of graduate students in 2017 in Serbia were women (and 56% of the students) [42], of which approximately 45% were women in STEM sciences (Figure 2), and about 35% of employed researchers in R&D organizations in the field of technical and technological sciences were women, we can get a more accurate picture of women's professional potentials which can help to an extent to enter the process of firms' digital transformation in an adequate way.

At this moment, there is no recorded survey on digital transformation in women-owned companies which can be compared to ours.

A recent research carried out in Serbia [38] in which there are a few similarities to our research objectives, although it applied different methodology and implemented a much larger sample that was not gender-disaggregated was conducted during 2018. Respondents were employees and managers at all levels in companies from different sectors, foreign and domestically owned, operating in Serbia. This means that the results obtained in this particular research are only partially useful for comparison with our own research.

A more detailed research for the purpose of obtaining an accurate idea about the current level of digital transformation reached by the companies in Serbia and their potentials, as well, is taking place on the website of the Center for Digital Transformation of the Chamber of Commerce and Industry of Serbia [5]. After selecting a particular enterprise, the objective of

Figure 2: The number of graduated students at all university levels and fields of study in Serbia in 2016/2017



Source: Statistical office of the Republic of Serbia [43] and authors' calculations.

this data collection is to introduce them into a training process that will contribute to their expertly guided, and thus more efficient, digital transformation. Since the results of these surveys are not published, we are not able to use them to compare with those obtained in our research. The only general conclusions that are presented publicly are as follows: 60% of enterprises in Serbia do not have a digital transformation process planned; 90% of companies that are planning digital transformation are purchasing basic software or a website, in 40% of the companies there is no responsible person for the process of digital transformation, and 5% of the annual turnover is planned for digital transformation [5].

Methodology

Sample and questionnaire

The empirical part of the research is based on the primary data collected through the questionnaire. The questionnaire is divided into three parts and consists of a total of 28 statements. The first part of the questionnaire consists of 18 statements, which were used to evaluate the degree of digital transformation, and one statement to confirm for how long the companies have been involved in the process of digital transformation. The second part consists of five statements for assessing business performance (financial and non-financial) adapted according to Gunday, Ulusoy, Kilic and Alpkan [18] and Naidoo and Hoque [33]. In the last part of the questionnaire, there are statements for assessing the demographic characteristics of the company. The questionnaire was created in accordance with previous research in the field of digital transformation [5], [8], [49], [50], where the statements were more concretized and substantiated by examples, in order to make it easier for respondents to understand what was required from them. Within the defined timeframe, 46 correctly completed questionnaires were received and included in the analysis. The sample characteristics are shown in Table 1.

Micro companies account for 61.4%, small companies 22.7%, and medium-sized companies for 15.9% of the total sample of the companies. About 62.3% of the companies have been in the process of digital transformation for a period of two to three years, 24.4% for one to two years, while 13.3% of the companies are in the initial stage of digital transformation. Questionnaires were filled in by (co)owners of companies, regardless of whether they owned majority (71.4%) or minority (28.6%) shares in the capital of the company. The sectoral structure of the companies is diverse, with the largest number of companies in the professional, scientific and technical sectors (13.2%), the creative industry (13.2%), the financial sector (13.2%), the food industry (10.5%), the metal industry (10.5%), trade (7.9%), tourism (7.9%) and others.

The research revealed that as many as 41.86% of the micro companies have been in the digital transformation process for more than two years, 11.63% for one to two years, and 9% are in the initial stage of this process. About 9.30% of the small companies have been in the digital transformation process for more than two years, and the same percentage of these companies is in the middle phase of digital transformation (one to two years), while 4.65% of the companies have just started this process. Medium-sized companies (11.63%), which also make up for the smallest part of the sample, have been implementing digital transformation for more than two years.

Table 1: Demographic characteristics of the sample

Number of employees	%	Start of digital trans. (year)	%
1-9	61.4	<1	13.65
10-49	22.7	1-2	20.93
50-250	15.9	2-3	62.79
Industry		%	
Professional, scientific and technical activities		13.2	
Creative industry		13.2	
Financial sector		13.2	
Food industry		10.5	
Metal industry		10.5	
Commerce		7.9	
Tourism		7.9	
Pharmaceutical and medical industries		5.3	
Textile and leather		5.3	
Construction industry		5.3	
Transport		2.6	
Utility services		2.6	
Organic production		2.6	
Missing		4.67	

Research hypotheses

The aim of the paper is to explore the impact of the achieved level of digital transformation on the overall business performance of the company, based on the available theoretical knowledge. An additional goal is to examine the existence of differences in the indicators of business performances among companies which have been in the process of digital transformation for less than two years and companies which have been in that same process for more than two years. This goal was set under the assumption that the companies involved in the process of digital transformation for more than two years were more successful in the said process in terms of qualitative changes and the stage of digital transformation they are in, which should ensure better performance in comparison to companies which have been involved in this process for a shorter period of time.

In accordance with the goals of the research based on the previously defined subject of analysis, the empirical part of the paper will focus on testing the following hypotheses:

H_1: Companies that have made significant progress in the process of digital transformation can expect to improve overall performance.

H_2: There are significant differences in the performance indicators between firms which have been included in the process of digital transformation for less than two years and those undergoing digital transformation for more than two years.

Results

Table 2 shows the values of Cronbach's alpha (CA), mean, correlation analysis and normality tests. The calculation of the CA coefficient determines the reliability, that is, the internal consistency between the statements used to create the variables. The recommended CA value is over 0.7. All variables have a CA value that is over 0.7 and range from 0.804 to 0.882. Based on these results, it can be concluded that the variables are reliable for use in further analysis. The next step is to determine the average values of the variables used. Companies in the sample are characterized by a relatively high level of digit-trans, with an average score of 2.33 (on a scale of 1 to 3). Average score of the perf is M=3.82 on a scale of 1 to 5. Normality tests, skewness and kurtosis range within the allowed scope for all variables (-2 to +2) [17], implying that the data were normally distributed. Based on this, it was decided to continue with the Pearson correlation. Correlation analysis shows a significant, positive and strong relationship between digi-trans and perf (r=0.516; sig=0.000).

The test results of the defined hypotheses are presented in Table 3 and Table 4.

The T-test of independent samples compared individual performance indicators and overall performance between enterprises undergoing digital transformation for less than two years and those that have been in the process for more than two years (Table 3). The value of Levene's test shows that the F statistic is not significant except for productivity, where the results which did not assume equal variances are presented. The difference in the profitability level between companies implementing digit-trans for up to two years (M=3.647) and those in the process for more than two years (M=3.828) is very small (η^2=0.01) and statistically insignificant (sig=0.492). Similar conclusions are reached when using turnover ($M_{LessThanTwo}$=3.588; $M_{LongerThanTwo}$=3.828; η^2=0.02; sig=0.379) and customer satisfaction ($M_{LessThanTwo}$=3.941; $M_{LongerThanTwo}$=4.138; η^2=0.01; sig=0.442) as performance indicators. Significant but moderate differences were identified with the productivity indicator ($M_{LessThanTwo}$=3.529; $M_{LongerThanTwo}$=4.138; η^2=0.09; sig=0.05) and product & service development capacity (η^2=0.11; sig= 0.05). Product and service quality is significantly different (η^2=0.14; sig=0.011) between companies that have been in the digit-trans process for more than two years (M=4.379) and companies that are in the initial stages of digit-trans (M=3.706). When looking at overall performances, the

Table 2: Reliability test, descriptive statistics, correlation analysis and normality tests

Variables	CA	Mean	Digit-trans	Perf	Skewness	Kurtosis	Shapiro-Wilk
Digit-trans	0.804	2.329	1	**0.516****	0.048	-0.921	0.973^{ns}
Perf	0.882	3.822	**0.516****	1	-0.208	-0.130	0.961^{ns}

Note: **Result is significant at the level of 1%; ns – not significant. a. CA for the questionnaire as a whole: 0.862

results confirm the accuracy of the first hypothesis H_2. The difference in overall performances between companies which have been implementing digit-trans less than two years (M=3.614) and companies exceeding two years (M=4.015) in the process is significant and moderate (η^2=0.07; sig=0.05) and is in favor of the companies from the second group.

The impact of digit-trans on business performance was analyzed using a simple OLS regression analysis (Table 4) method. The results imply that digit-trans has a significant, positive and strong impact on perf (β =0.516; sig=0.000). An improvement of 1% in the digit-trans process affects the perf enhancement by 0.52%. A value of adjusted R^2=0.25 means that digit-trans accounts for 25% of perf variability, while the rest of the variance is accounted for by factors not included in the model tested. There are no autocorrelation problems in the model (Durbin-Watson=2.262).

Robustness check

To test the robustness of our results, an additional analysis (Table 5) related to examining the impact of company size on the relationship between digital transformation and company performance was conducted. It is considered that smaller companies lack high-quality personnel more often than larger ones, especially in the managerial department, and that they have a restricted access to financial resources [16]. In order to successfully implement the process of digital transformation, it takes skilled, qualified, highly motivated personnel with leadership skills, capable of managing an enterprise and leading its employees through a process of change based on the use of digital technology. Apart from that, financial resources are vital for the modernization of the existing technology and the procurement of new digital technology which should, with all the other factors, ensure success in the process of digital transformation, especially if the company has aspirations to reach a leading position in the market. On the other hand, it is possible that digital transformation would be easily and more successfully implemented in smaller companies. Firstly, there are companies with simple organizational structures, where it is easier to coordinate the activities of those employed in the midst of a process of change. Secondly, in smaller companies there is a greater possibility of the employees sharing the same value system, attitudes and assumptions, which is of great importance for success in the process of digital

Table 3: Are there any differences in performance indicators depending on how many years the companies have been in the process of digital transformation?

Performance indicators	No. of years in the process of DT	Mean	Levene's test	η^2	Sig
Profitability	Less than two More than two	3.647 3.828	Not significant	0.01	0.492
Turnover	Less than two More than two	3.588 3.828	Not significant	0.02	0.379
Product and service quality	Less than two More than two	3.706 4.379	Not significant	0.14	0.011
Productivity	Less than two More than two	3.529 4.138	Significant	0.09	0.05
Customer satisfaction	Less than two More than two	3.941 4.138	Not significant	0.01	0.442
P&S development capacity	Less than two More than two	3.412 4.069	Not significant	0.11	0.022
Overall performance	Less than two Longer than two	3.614 4.015	Not significant	0.07	0.05

Note: When the Levene's test was not significant, we used the results which assumed equal variances.
Source: Calculated by authors.

Table 4: Simple OLS regression

Variable	β	Sig	F	R^2	Adjusted R^2	Durbin-Watson
Digit-trans	0.516	0.000	15.971**	0.266	0.250	2.262

Note: **Result is significant at the level of 1%. a. Dependent variable: Performance.
Source: Calculated by authors.

transformation. Furthermore, digital technology required for a smaller consultant agency or a trading company not only differs in its complexity of use, i.e., integration in the business, but also in price as opposed to the technology needed for a metal company or a food company. Companies owned by women are usually in the SMEs category and are located in traditional sectors, whose activities are usually characterized by a low level of novelties regarding the use of complex digital technology.

The moderation effect of company size has been analyzed using hierarchical regression analysis. All three models have been well set (R^2>0.25; Fsig=0.000; VIF<10; 1.5<DW<2.5). After including the company size moderator variable (Model 2) and the moderation effect (interaction between digit-trans and company size) in Model 3, the results are still robust. This means that there is no moderation effect of company size. There is no significant influence on the core results of the digit-trans and perf in women-owned firms (moderation effect: β=-0.004; sig=0.979). The obtained results indicate that hypothesis H_1 can be accepted.

Discussion and conclusion

The main objective of the research is to analyze the effects of digital transformation on the performance of women-owned businesses. The results of the applied statistical analysis methods show that there is a relatively high degree of digital transformation in the created sample, and the assumption about the positive implications of digital transformation on company performance (H_1 is accepted) is confirmed. This result is in line with the study conducted by Westerman et al. [47] and Nwankpa and Roumani [34]. Significant differences were also observed in the level of product and service quality, product & service development capacity, productivity, and overall performance in favor of companies that have been undergoing digital transformation for more than two years compared to the companies in the initial stages of digital transformation. In contrast, no significant differences were found in profitability, turnover, and customer satisfaction levels. However, having in mind that hypothesis H_2 places focus on overall performance, it can be stated that the hypothesis is accepted, noting that there are differences when considering individual indicators.

The conducted research has significant implications in theory and practice. Considering the fact that the field of digital transformation is new and rather unexplored, especially when the gender aspect is included in the context, where only two papers with similar goals have been identified in the literature, the conducted analysis stands as a significant contribution to expanding and complementing existing theoretical knowledge. A new definition of digital transformation has been conceived in line with previous research and the context of this paper, which is acceptable regardless of the gender aspect of the enterprise. Research can be helpful to owners and managers in terms of learning about the features of the digital transformation concept, the importance of digital transformation for improving business performance, as well as a tool for measuring digital maturity. The survey provides insight into women-led businesses and ownership

Table 5: Hierarchical regression analysis

Variable	Model 1			Model 2			Model 3		
	β	Sig	VIF	β	Sig	VIF	β	Sig	VIF
Digit-trans	0.516	0.000	1.000	0.535	0.000	1.040	0.535	0.000	1.047
Company size				-0.097	0.468	1.040	-0.096	0.485	1.082
Moderation effect							-0.004	0.979	1.055
F statistics	15.971**			8.169**			5.320**		
R^2	0.266			0.275			0.275		
R^2 change	0.266			0.009			0.000		
Adjusted R^2	0.250			0.242			0.224		
Adjusted R^2 change	0.250			-0.008			-0.018		
Durbin-Watson	2.289								

Note: **Result is significant at the level of 1%. a. Dependent variable in all models: Performance. b. Before calculating the moderation effect, the digit-trans and company size variables were standardized to avoid the occurrence of multicollinearity problems. c. Company size is a dummy variable – 1 (up to 20 employees) and 0 (otherwise).
Source: Calculated by authors.

over companies which are in the digital transformation process, which is also an under-researched area, pointing out that women's businesses, which are mostly micro and small, see digital transformation as an important tool for achieving better business results, and that as many as 41.86% of women-owned micro enterprises have been in the digital transformation process for more than two years. If we know that 60% of enterprises in Serbia do not have a planned digital transformation process, then we can conclude that digital transformation is at the same time a chance for groups of enterprises with difficult access to finance and the market, such as those owned by women, to achieve better business performance. It is symptomatic that the level of customer satisfaction, as an essential generator of profitability, does not greatly differentiate between companies undergoing a digital transformation for less than two years and those that have been in the DT process for more than two years. This result can be explained by the fact that the passage of time did not bring about significant progress in the DT process in terms of transition to multiple stages of the DT, and that the DT process mainly covered activities that do not provide direct benefit to consumers or are invisible to them, which did not lead to significant changes in their satisfaction level. This is also indicated by the fact that over 76% of enterprises use eGovernment services, 51.5% are qualified to receive e-invoices, 73.9% use accounting software, 63.1% perform e-invoice processing and the like. In contrast, in a small number of companies, digital technologies have been used to better meet the wishes and needs of modern consumers. Only 31.8% of the companies managed to innovate their business model according to consumer needs (free basic product/service and sale of additional product/service, rental instead of sale, advertising space, license, data sale, free capacity sale), while 45.5% of companies point out that digitization has generated additional benefits for consumers (easier use of the product range, optional location, greater choice, etc.). All of the above indicates that in the coming period, companies should shift their focus to consumers, i.e. to a more productive use of digital technologies, which will be in the function of modernizing relations with consumers and generating an optimal digital experience for consumers.

Despite its significant theoretical and practical implications, this research faces certain limitations from which recommendations for future research work may arise. The research was conducted at one point in time. This kind of problem requires conducting a longitudinal study that would provide a more objective insight into digital transformation over time because, as stated, it is an ongoing process. Second, the analysis includes companies managed and (co)owned by women, which gives an insight into the gender aspect of digital transformation, but at the same time imposes the need for a comparative analysis in some subsequent research with the SMEs run and own by women as well as men. Third, the limitation is exogenously determined and concerns the absence of similar studies, which diminishes the possibility of comparing the results obtained and drawing more complete conclusions.

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DEVELOPMENT OF GREEN ECONOMY AND COMPETITIVENESS OF EU COUNTRIES: MACRO-LEVEL EMPIRICAL ANALYSIS

Razvijenost zelene ekonomije i konkurentnost EU zemalja – empirijska analiza na makro nivou

Abstract

In the past two decades, continuous changes caused by environmental degradation and global warming have contributed to the emergence and actualization of the green economy concept. Applying green principles enables economic growth and development while respecting all aspects of the environment. Green economy is a function of sustainable development as a dominant trend in the global framework, but it is also a sort of a challenge and opportunity for improving national economic competitiveness as the main indicator of success in the world market. The focus of the paper's analysis are four indicators that are relevant to different segments of applying the green economy concept, which are grouped by the DEA method into the composite index GEDI (Green Economy Development Index). Bearing in mind that innovations are very important for the adoption and implementation of the green economy, the emphasis of the research was on examining the relationship between GEDI and the third subindex of the Global Competitiveness Index, which focuses on innovations in the European Union countries. The aim of this comparative analysis is to define future guidelines and recommendations for more efficient implementation of environmental standards and to achieve a sustainable competitive advantage in the long run.

Keywords: *green economy, competitiveness, DEA analysis, composite index.*

Sažetak

Kontinuirane promene uslovljene degradacijom životne sredine i globalnim zagrevanjem u poslednje dve decenije su doprinele nastanku i aktuelizaciji koncepta zelene ekonomije. Primena zelenih principa omogućava rast i razvoj privrede uz istovremeno uvažavanje svih aspekata životne sredine. Zelena ekonomija kao takva je u funkciji održivog razvoja kao dominantnog trenda u globalnim okvirima, ali i svojevrstan izazov i mogućnost za unapređenje konkurentnosti privrede kao pokazatelja uspešnosti na svetskom tržištu. U fokusu analize rada bila su četiri indikatora koji su relevantni za različite segmente primene zelene ekonomije, a koji su korišćenjem DEA metoda grupisani u kompozitni indeks GEDI (Green Economy Development Index). Imajući u vidu da su inovacije veoma značajne za usvajanje i primenu zelene ekonomije, akcenat istraživanja bio je na ispitivanju relacije između GEDI indeksa i trećeg podindeksa globalnog indeksa konkurentnosti čiji su fokus inovacije u zemljama Evropske Unije. Cilj komparativne analize je i definisanje budućih putokaza i preporuka za efikasniju primenu ekoloških standarda i sticanje održive konkurentske prednosti u dugom roku.

Ključne reči: *zelena ekonomija, konkurentnost, DEA analiza, kompozitni indeks.*

Introduction

Globalization, the ongoing Industry 4.0, as well as climate changes, are the attributes of modern economies. Dynamic and volatile business environment, convergence of different industries, and also a higher degree of ecologic sensitivity, have all contributed to the relativization of the positions of companies in the context of new business models. The said tendencies, as well as a proactive market approach in the form of change management, have enticed the development of the green paradigm for companies, and this has further conditioned the implementation of the green economy concept. In this respect, energy efficiency, recycling and the use of renewable energy resources become the imperatives of doing business, and this additionally emphasizes the importance of the environment for companies and economies. In other words, it is necessary to acknowledge all environmental aspects in order to gain global competitive advantage.

Having in mind the abovementioned, the green economy concept represents an economy whose performance leads to improvement of human well-being and social equality, while significantly decreasing environmental risks [4]. As such, it is also compatible with the term of green growth, which aims to decrease the use of nonrenewable resources that are one of the reasons of environmental devastation. Pursuant to this, green economy and green growth are inseparable links that serve the ultimate goal of sustainable economic development. For the purpose of as effective as possible implementation of the green economy standards and principles, both technology innovations, as well as the support of governmental industrial policies, are absolutely necessary.

On the other hand, national economic competitiveness has always been the focus of many economists' work. Intuitively, it is an important indicator of economic success in international terms. As such, national economic competitiveness makes a distinction between more and less effective economies in the world. There are several indicators of competitiveness, and the GCI (Global Competitiveness Index) is the most widely used one. Each year, the World Economic Forum publishes a report ranking 140 countries based on GCI indicators.

The focus of this paper is to identify and analyze the possible correlations between green economy and national economic competitiveness. In other words, one of the goals of the paper is to determine if the countries that have implemented the green economy principles are also more competitive than the ones that have not. For the purpose of a more comprehensive analysis, by applying the DEA (Data Envelopment Analysis) method, we will construct a composite index GEDI (Green Economy Development Index), which refers to the degree of green economy development in a national economy. GEDI contains four indicators that refer to different environmental aspects.

In the paper, we will examine the correlations between the GEDI and the indicators of competitiveness within the GCI (Global Competitiveness Index). The emphasis will be on the EU countries that are highly competitive and that are characterized by high engagement and application of the green standards. The obtained result may also be interesting for the less developed economies, such as Serbia, in the context of improving strategic competitiveness as an integral part of the economic policy. One of the aims of this paper is to implicate, precisely through theoretical considerations and comparative analysis, the existing gaps and future guidelines and recommendations for a more effective application of green economy as a precondition for achieving sustainable development and acquiring competitive advantage based on it.

Green economy as a precondition for sustainable economic growth

The imperative of changes caused by an overuse of resources, global warming and environmental devastation has also incited the development and implementation of the green economy concept. Ever since the 1970s, when the idea first emerged, green economy remains an important global topic. As such, at the same time it represents an add-on, but also a necessary condition for achieving long-term sustainability. Taking into consideration the abovesaid, the concept of green growth is an integral part of the green economy concept, that is, economic growth with minimum environmental impact [12].

In general, green economy has many recognizable characteristics. Namely, one of the initial premises of the concept is replacing conventional linear production by a circular economy model. The linear model, simply represented through four stages, *take–produce–spend–dispose*, has numerous limitations and disadvantages embodied in inefficient resources management, environment degradation accompanied by increasing costs of waste disposal and environmental costs of business operations. The problem and possible consequences of irrational exploitation of natural resources is best presented through the Seneca effect, which creates a correlation between resources and economic development. Specifically, the economic growth based on the exploitation of resources is slow and gradual, but it causes increasing pollution and waste pileup, which ultimately implies a fast and plummeting economy collapse [1]. One of the causes of inefficient use of resources is the low price, as well as the absence of a suitable legal framework in the context of decreasing negative environmental externalities and transaction costs [13]. All of the aforementioned tendencies have conditioned the transition to take direction of circularity and sustainability.

Although there is no single uniform definition in the literature, circular economy as the very core of the green economy concept emphasizes energy efficiency, recycling and greater use of renewable energy sources with minimum waste (the zero-waste principle). The reuse of outputs or its segments in the form of new (secondary) inputs results in lower costs of energy, raw materials, storage and environmental costs for companies. In other words, implementation of circular economy contributes to the increase of companies' business efficiency and more rational resource management.

As a result, green products most often emerge as a second important characteristic of the green economy. Eco-friendly products are completely compatible with the environment, where improvements with respect to design, package, use and quality ensure a higher degree of added value for consumers [5]. Creating eco-friendly products implies changes in the entire product life cycle. Likewise, green products also imply the use of green inputs, whereby they additionally incite companies' innovation potential. In this respect, green products can contribute to the growth of market share and sales volume, which ultimately can also have macro effects in the form of export, GDP and employment increase. Furthermore, the redesigned products may have an important role in the process of increasing the competitiveness of companies and the economy.

The implementation of circular and green economy concepts contributes to bringing the economic and environmental principles closer together, which have more often than not been diametrically opposite. Pursuant to this, it is necessary to refocus the micro and macro objectives from economic maximization to sufficiency and sustainability. With the purpose of applying and spreading the green economy concept as successfully as possible, the aforementioned support of the government and its institutions such as universities, consumers, markets, nongovernmental agencies etc., cannot be omitted [3]. However, innovations have an immanent importance in spreading the green economy.

We differ two types of innovations:

- Innovations with the purpose of pollution decrease;
- Innovations with the above-stated purpose, but with an increase of the resources' productivity.

From the aspect of environmental conservation, the second type of innovations is far more important, and it is also closely linked to creating green products. Specifically, the authors find that technological innovations play a key role in the application of environmental standards and improvement of competitiveness derived therefrom [8], [12]. In addition to this, green economy entails using and investing in cleaner technologies, which further encourages the investment activities of the economy. On the other hand, investments in cleaner technologies also imply cleaner productions.

Having in mind all of the above-stated characteristics, green economy can also be observed from the perspective of Porter's Diamond Model of national competitiveness. As such, green economy creates a climate for gaining competitive advantage, which is crucial in global economic flows. Likewise, all characteristics and attributes of green economy confirm its potential as the carrier of long-term sustainable economic development.

Competitiveness as the measure of national economies' success – Concept, factors, indicators

Globally speaking, national economic competitiveness is an important indicator of the economy's efficiency, which determines the position of a national economy in the international market, its export potential, standard of living and GDP. As economic theory developed, the concept itself has evolved, and two views of competitiveness have emerged. According to the first one, the classical approach, national economic competitiveness is based on natural resources and it is, basically, a zero-sum game. Namely, if a country has an abundance of a particular production factor which it uses for products or services it exports, it will be competitive. Adam Smith and David Ricardo were the pioneers of this concept, and they viewed competitiveness in the context of absolute and competitive advantages, where success of one national economy in the world means failure for another national economy.

According to the second view, which prevailed in the modern world, national economic competitiveness is the result of productiveness, that is, efficient use of the production factors in the process of creation of main export products. Success of a national economy in the world market depends on its ability to improve and innovate itself. Compliant with this is the contemporary definition of the World Economic Forum, which defines competitiveness as a set of institutions, factors and policies which determine the level of productiveness of a country [18]. One of the main proponents of the second approach is Michael Porter, who starts with the premise that competitiveness is not inherited, but created [15]. In Porter's view, competitiveness is a win-win situation where several economies can be competitive at the same time. This concept emphasizes the close connection, but also recognizes the difference between macro competitiveness and competitiveness of companies as the basic subjects of every economy.

In this respect, the existence of macro competitiveness does not a priori mean that the national economy is also competitive. Bearing this in mind, micro and macro factors have a significant role in competitiveness. Although essentially different, both approaches are highly complementary and maintain the goal of providing an integral and comprehensive picture of national economic competitiveness in the world. The factors of company's competitiveness are observed through the concept of five competitive forces (power of customers, power of suppliers, potential of new entrants into the industry (entry barriers), competition in the industry and threat of substitute products) that are basically opportunities or threats to company performance in their own right. On the other hand, macro competitiveness is analyzed based on the abovementioned Porter's Diamond Model of national competitiveness which provides, through four dimensions (factor conditions, related and supporting industries, company strategy and demand conditions), an insight into the nature of economic climate from the aspect of potentials and limitations in which companies operate.

There are two more concepts relevant to this analysis which are also very close to the concept of competitiveness: competitive advantage and distinct competitiveness [11]. Both terms are related to micro competitiveness and thus show a company's potential for high-quality business performance, successful positioning and creating value.

An important step in competitiveness analysis is measuring it. Having in mind the complexity and multifactor character of the concept, all relevant micro and macro factors and drivers of a country's success in the global market must be taken into consideration while conceptualizing the indicators. Pursuant to this, one of the most common indicators in the economic analysis is GCI. This is one of the most comprehensive tools for ranking world economies. GCI emphasizes the importance of productivity for a country's prosperity in the sense that higher values of this index imply higher productivity and better prosperity [16]. Distinctiveness of the index itself is reflected in the multidimensional approach, since it observes competitiveness from the aspect of different indicators that are grouped into twelve pillars. The twelve pillars basically cover the factors that are represented based on the Porter's Diamond Model and the Five Competitive Forces Model.

One especially interesting segment of global competitiveness is the 3rd subindex, which focuses on

innovations and business sophistication. The main results of a company's research and development (R&D) processes are precisely innovations, but also improvement of business operations and creating value based thereon. Accordingly, there is a two-way connection between innovations and business sophistication. In other words, growth of innovative potential improves the business sophistication and vice versa.

Besides institutional support and market incentives, the diffusion of innovations in a national economy is crucial for implementation and application of the green economy standards and its principles [9]. On the other hand, observed from the aspect of long-term sustainability, the greatest potential for a country lies in competitiveness based on innovations. Having in mind the importance of innovations both for green economy implementation, as well as for competitiveness, in the next step of our analysis we will try to provide the answer to the question of whether there is a relationship between the applying environmental principles and the improvement of competitiveness derived therefrom, observed through the prism of the 3rd subindex.

Green economy development index

In accordance with the abovesaid peculiarities of green economy, the main emphasis in the paper will be on the application of the DEA (Data Envelopment Analysis) method for the purpose of constructing a composite index. The DEA analysis, as a unique linear programming tool, enables comparison of different economy segments, starting from ICT use, environment, education, demography, micro and macroeconomy etc. [14]. The main advantage of the DEA method is in that it relies on the composite index instead on several different individual indicators that represent individual elements of the selected areas. Specifically, we will construct a Green Economy Development Index (GEDI), which refers to the degree of the green economy development in an economy.

In constructing the GEDI, we will focus on four indicators: 1) environmental taxes by economic activities (i.e., green taxes – GT), (2) circular material in use (CM), (3) share of renewable energy in gross energy consumption (SRE), and (4) trade in recyclable raw materials (TR). The indicators were selected to represent different green economy aspects, starting from the state of the environment, dispersion of green production, and the amount of investments in the environment, and all this for the purpose of a comprehensive macro-level empirical analysis. While selecting indicators, the starting point was previous research of other authors with similar topics – application of composite indices in the field of the environment (e.g., sustainable energy) [10], [19]. In addition to this, according to Harris and Goodstein, green taxes are a relevant indicator for the analysis, having in mind that green taxes systems are an effective way to internalize the negative externalities, which occur as the consequence of economic activities [7], [9]. Similarly, a heavier reliance on alternative energy sources, such as the energy of the Sun, wind and water, decreases GHG[1] emission and the greenhouse effect. Finally, the use of recycled inputs and the green products trade underlies the total potential of circular economy as one of the main characteristics of industrial ecology.

The official Eurostat data for 2014 have been used to calculate the GEDI. Their original values are presented in Annex 1. The data shown refer to 25 European Union countries.

The application of the DEA method requires determining an adequate number of national economies to be included in the analysis. The most often used rule is that the number of the observed units (national economies) should be at least two times larger than the number of indicators [6]. The GEDI structure, with accompanying indicators, is presented in Table 1.

Table 1: GEDI and individual indicators

Main index	Indicators used
Green economy development index (GEDI)	1. Environmental taxes by economic activities (**GT**) (million EUR)
	2. Circular material in use (**CM**) (%)
	3. Share of renewable energy in gross energy consumption (**SRE**) (%)
	4. Trade in recyclable raw materials (**TR**) (tonne)

Source: Authors' illustration.

1 GHG – greenhouse gasses. GHG emission refers to excessive atmospheric concentration of CO2 and SO2, which are among the main causes of the greenhouse effect and climate change.

Generally speaking, calculation of the composite index is an iterative process containing several steps (Figure 1). After defining the selection of individual indicators, as well as the year representative for the analysis, normalization of their values has been performed. The reason for this lies in the fact that higher values of some indicators imply better, while higher values of other indicators imply worse performance of an observed country. Normalization is conducted in the interval from 0 to 1. In the next step, the weights necessary in the final calculation of the composite index are set for each subindex. The DEA methodology is specific in that the weights of individual indicators are determined endogenously, that is, they are different for each individual economy [19], [20]. The obtained weight value is such that there is no other combination of weights that would bring the analyzed economies in a better position. Optimal weights are calculated based on the following relations:

$$CI_j = max \sum_{i=0}^{n} y_{ij} w_{ij}$$

$$\sum_{i=0}^{n} y_{ij} w_{ik} \leq 1 \quad w_{ij} \geq 0$$

where $i=0,1,...,n$, $j=0,1,...,m$, i $k=0,1,...,m$.

In the above equation, y_{ij} is the value of the indicator i for the country j, where higher values denote better performance, by using m indicators for n countries. The symbol w_{ij} denotes the value of the ponders used for aggregation of the indicators, while CI_j denotes the composite index that we are calculating.

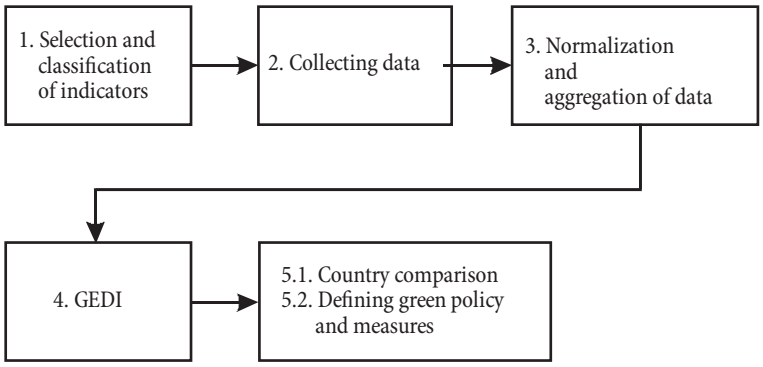
The main limitation of GEDI and DEA methods in general is the static character of the analysis. This means that the calculated values show only the achieved level of green economy development, as well as the advantages and the disadvantages of each economy. It is not possible to analyze the specific samples and possible consequences of the existing state due to the lack of a dynamic component.

Research context and results

In the calculation of GEDI, we used four indicators that relate to different environmental fields, starting from the costs in the form of green taxes, to the use of renewable energy sources and recycled inputs obtained as the result of circular economy, to the benefits in the form of added value and green products trade. The analysis included 25 EU countries: Austria, Belgium, Bulgaria, Croatia, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom, which are characterized by a certain degree of application of green economy standards. We have excluded countries such as Cyprus, Luxembourg and Malta from our analysis due to lack of data that relate to specific indicators. The data used are the official data from Eurostat statistical base for 2014.

All of the selected indicators show the same trends in the sense that higher values contribute to better environmental performance of a national economy. For example, the innovated materials and recycled raw materials that emerge as the consequence of circular economy implementation contribute to the growth of the

Figure 1: GEDI construction process



Source: Authors' illustration.

production of eco-friendly products, higher added value for consumers, as well as higher green export potential. Likewise, the growth of the share of renewable energy sources contributes to the decrease of the GHG emissions. The analysis has shown that there is a positive correlation between green taxes by economic activities, the level of investments, opening new (green) job positions and green products trade (0.66 and 0.54, respectively). On the other hand, there is a weak negative correlation between the share of renewable energy sources in gross energy consumption and the other stated indicators (–0.34 and –0.39, respectively), which is explained by the fact that the use of alternative energy sources cannot produce the same cumulant of energy as in the case when a combination of nonrenewable and renewable resources is used, which further brings into question the functioning of the entire production, industry and national economy in general. The graphic representation of the indicators with the interrelated correlation coefficient is provided in Figure 2.

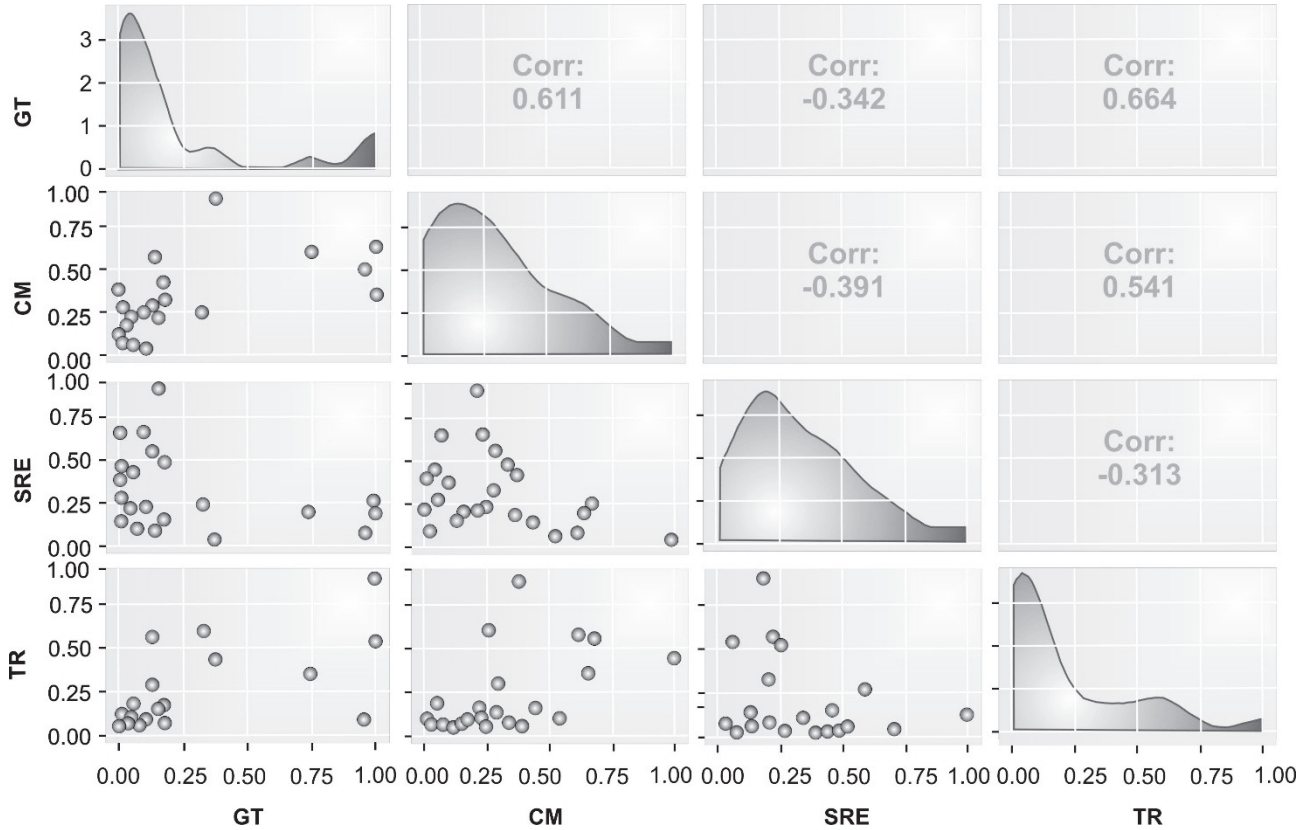
After selecting the indicators, we normalized the values of each indicator in the next stage of the DEA method in order to obtain the final composite index. The normalized indicator values are shown in Table 2.

In the next step, we calculated the GEDI for the EU economies whose values are in the interval between 0 and 1, where the values close to 0 imply poor green performances, while the values approaching 1 show remarkable results in environmental principles implementation. In this regard, Germany, Italy, Sweden and the UK are the most successful countries observed from the aspect of green economy development. The values of individual indicators,[2] which refer to different aspects of the environment, further confirm this statement. Namely, national economies with the best performances have high values of at least three out of the four stated indicators that are included in the composite index. On the other hand, Slovakia, Hungary, Greece, and the Czech Republic scored lowest, that is, they have performed poorly with respect to the green standards implementation.

In accordance with all of the above stated, in the next stage of our research, we examined the correlation

2 The values of individual indicators are shown in Annex 1.

Figure 2: Correlation between individual indicators



Source: https://fvidoli.shinyapps.io/compind_app/.

Table 2: Normalized values of individual indicators

Country name	GT	CM	SRE	TR
1. Austria	0.12	0.28	0.58	0.27
2. Belgium	0.13	0.61	0.05	0.57
3. Bulgaria	0.01	0.05	0.26	0.01
4. Croatia	0.01	0.04	0.47	0.01
5. Czech Republic	0.04	0.21	0.20	0.06
6. Denmark	0.17	0.33	0.51	0.02
7. Estonia	0.00	0.38	0.44	0.00
8. Finland	0.09	0.23	0.71	0.01
9. France	0.74	0.65	0.19	0.33
10. Germany	1.00	0.37	0.17	1.00
11. Greece	0.10	0.00	0.20	0.04
12. Hungary	0.03	0.16	0.19	0.04
13. Ireland	0.07	0.02	0.06	0.00
14. Italy	0.99	0.67	0.24	0.55
15. Latvia	0.01	0.07	0.71	0.02
16. Lithuania	0.00	0.09	0.38	0.01
17. Netherlands	0.37	1.00	0.00	0.42
18. Poland	0.17	0.44	0.12	0.11
19. Portugal	0.05	0.04	0.45	0.14
20. Romania	0.05	0.01	0.41	0.00
21. Slovakia	0.01	0.13	0.13	0.02
22. Slovenia	0.01	0.27	0.34	0.08
23. Spain	0.32	0.25	0.22	0.60
24. Sweden	0.15	0.21	1.00	0.11
25. United Kingdom	0.95	0.53	0.03	0.05

Source: Authors' calculation.

Table 3: GEDI and 3rd subindex of GCI in EU countries (2014)

Country	GEDI	Normalized values of the 3rd subindex of GCI
Austria	0.82	0.78
Belgium	0.85	0.75
Bulgaria	0.26	0.00
Croatia	0.47	0.07
Czech Republic	0.37	0.33
Denmark	0.74	0.78
Estonia	0.73	0.34
Finland	0.79	1.00
France	0.89	0.66
Germany	1.00	0.97
Greece	0.26	0.07
Hungary	0.31	0.13
Ireland	0.11	0.64
Italy	1.00	0.39
Latvia	0.70	0.14
Lithuania	0.39	0.27
Netherlands	1.00	0.87
Poland	0.54	0.15
Portugal	0.53	0.33
Romania	0.41	0.02
Slovakia	0.23	0.08
Slovenia	0.54	0.25
Spain	0.72	0.36
Sweden	1.00	0.92
United Kingdom	0.95	0.79

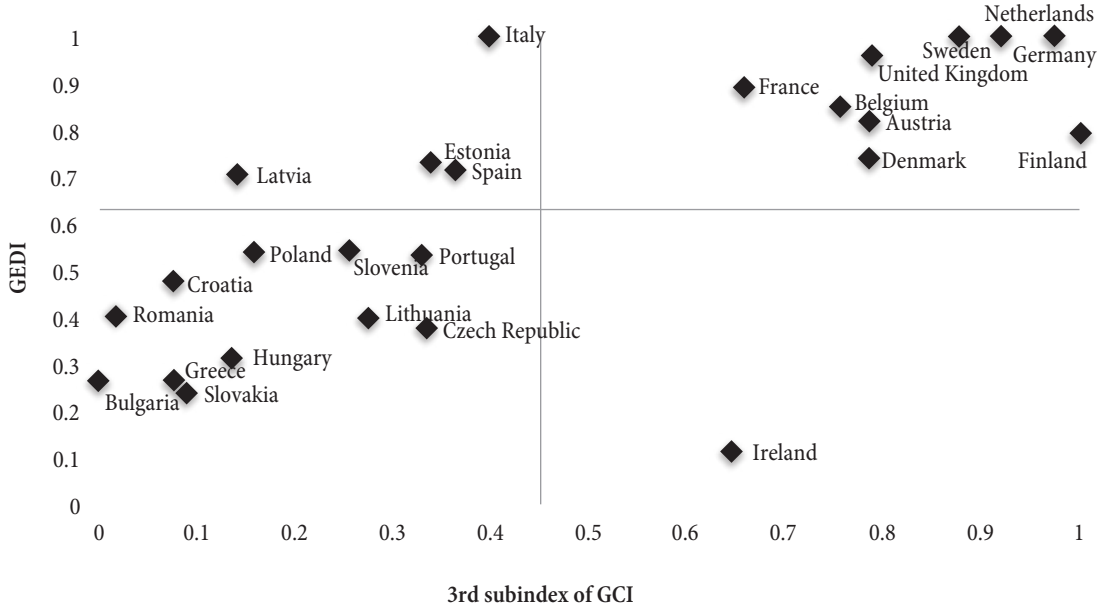
Source: Authors' calculation.

between GEDI and the 3rd subindex of GCI, which measures competitiveness through the prism of innovation and business sophistication of companies. As in the case of GCI, the value of the observed 3rd subindex fluctuates within the interval between 1 and 7, where values closer to 7 imply better innovativeness and business sophistication. The data for the subindex values is taken from the official data base of the World Economic Forum. The values of GEDI and the 3rd subindex of global competitiveness per country for 2014 are summarized in Table 3.

Finally, normalization of the 3rd subindex of GCI values is performed in the last iteration, and we observe the degree of correlation with the data relevant for GEDI, for the purpose of correlation coefficient calculation. The analysis has shown that there is a moderately strong correlation between the stated variables, and the Pearson's coefficient of 0.72 also confirms this correlation. Therefore, we have confirmed the starting assumption that the green principles implementation and application can to a certain extent improve national economic competitiveness. The argument in favor of the achieved result is also the fact that other micro and macro indicators, such as institutional and market efficiency, exchange rate levels, foreign debt levels, transparency of companies' business operations, availability of education and health care, also impact the national economic competitiveness, therefore, respecting the environment and its postulates does not represent a dominant factor for a country's global success, but it does have a certain impact.

Having in mind the obtained results, in the final iteration, the authors prepared a graphic illustration (Figure 2) in the form of a matrix, where national economies were classified according to two criteria: (1) value of GEDI, and (2) value of the 3rd subindex of GCI, respectively. The graphic illustration also points out to the advantages and disadvantages of the EU countries observed from the perspective of green economy, innovations and competitiveness based thereon.

Figure 3: Matrix GEDI and 3rd subindex of GCI – EU Countries



Source: Authors' illustration.

Namely, the combined values of the two indices classified national economies into quadrants, where the most successful countries are in the top right quadrant. In other words, Germany, Sweden, the Netherlands, the United Kingdom, France, Austria, Finland, Denmark and Belgium indicate that implementation of the green dimension contributes to improving the innovative potential and economy sophistication. Specifically, respecting the environmental postulates in these countries is a direct implication, and also the result of global environmental measures and policies, investments in equipment and systems for reduction of noxious gasses emission and pollution, as well as efficient climate change management. Having in mind the long-term perspective, the green principles' application in the stated countries may be observed as a source of competitive advantage in its own right and in the service of achieving the goals of sustainable development.

On the other hand, the analysis has also shown that certain EU countries are in the initial stages of green economy development, and also exhibit a low degree of competitiveness (bottom left quadrant). In this regard, observed from the aspect of the stated criteria, Croatia, Romania, Slovenia, Lithuania, Bulgaria, Poland, Greece, the Czech Republic and Portugal show the poorest performance, which is most often the consequence of inefficient green policy or the lack of proper infrastructure or financial institutional support. Also, moderate reliance on renewable resources or insufficient use of potential circular economy may also be the cause of the obtained results.

The greatest exception to the rule is noticeable in the cases of Italy, Spain and Ireland. Globally speaking, despite the fact that they have achieved significant results in the environmental domain (GEDI=1 and GEDI=0.72, respectively), Italy and Spain have reached a medium level of competitiveness, which is a direct consequence of the impact of substantial public debts, high unemployment rate, presence of corruption in public institutions and insufficiently used innovative potential in the research and development context. The calculated results may serve as a sort of guidance in the direction of improving the existing drivers and carriers of competitiveness.

On the other hand, if measured based on the 3rd subindex of GCI, Ireland boasts better national economic competitiveness than Italy and Spain, but it also records significantly lower environmental achievements. In this respect, it is necessary that Ireland enforces the laws and regulations regarding environmental protection more effectively, and also to focus on using alternative energy sources, internalizing negative externalities through the green taxes system, as well as on completing the transition towards the industrial ecology model.

Conclusion

The main objective of this paper is to investigate if there is a link between green economy standards implementation and national economies' competitiveness. An empirical research, conducted by focusing on the DEA method and simple correlation, confirmed the initial premises of the paper and indicated that green economies do indeed achieve a higher degree of competitiveness, with the emphasis on innovation and business sophistication, and also strike a better position in the global market. In other words, green standards implementation is becoming an important element of global competitiveness, that is, one of the important factors that differentiate successful from the less successful countries.

Generally speaking, abandonment of conventional linear production models, as well as transition in the direction of circularity, energy efficacy and renewability additionally integrates economic and environmental objectives that have more often than not been divergent. The change of the paradigm that companies are the main subjects of the economy has conditioned refocusing the objectives from economic maximization to sufficiency and sustainability. Lesser exploitation of nonrenewable resources, as well as recycling, further incite innovative processes within companies, which results in products that are more sophisticated and have higher added value. Therefore, increase of export and competitiveness based thereon further leads to higher employment rates and higher GDP.

The analysis in this paper makes a distinction between countries that have achieved significant results in the context of adoption of environmental standards and improvement of competitiveness based on innovations, and the countries that have not. Specifically, national economies that usually dominate European and global markets at the same time have the greatest potential to achieve green growth and adopt environmental postulates. The results obtained in the analysis could be important from the aspect of future research in the field of industrial ecology.

Examples of good practice can, as such, further be used as guidelines and benchmarks to identify the existing gaps and improve performances of the lesser developed economies within the EU, but also of the countries that are not EU members, such as the Republic of Serbia. Also, in addition to the abovesaid attributes, the wide range of the benchmark analysis enables defining specific measures and policies that enable better results, and that are at the same time crucial for achieving long-term sustainability.

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Annex 1: Raw values of the individual indicators

Country name	GT (mil. EUR)	CM (%)	SRE (%)	TR (tonne)	3rd subindex of GCI
Austria	8,334.23	8.60	8.00	6,619,411	5.14
Belgium	1,167.82	16.90	18.00	216,462	5.07
Bulgaria	3,281.30	2.70	15.00	856,109	3.28
Croatia	10,621.56	2.40	29.60	368,610	3.46
Czech Republic	58,177.37	6.90	13.80	11,366,205	4.07
Denmark	533.10	9.80	26.30	114,578	5.14
Estonia	4,641.24	11.00	8.70	91,836	4.08
Finland	6,522.96	7.30	15.30	557,843	5.65
France	19,382.00	17.80	16.10	6,899,891	4.84
Germany	43,661.00	10.70	14.70	3,882,296	5.59
Greece	1,390.87	1.40	27.80	216,909	3.46
Hungary	58,174.99	5.40	17.10	6,331,576	3.60
Ireland	853.59	1.90	38.70	307,552	4.81
Italy	633.88	18.50	23.60	176,839	4.22
Latvia	2,690.98	3.10	14.60	550,141	3.61
Lithuania	22,255.00	3.80	5.50	4,915,224	3.93
Netherlands	7,973.60	26.70	33.00	3,124,073	5.36
Poland	10,562.10	12.50	11.50	1,396,079	3.65
Portugal	3,933.90	2.40	27.00	1,694,945	4.06
Romania	3,516.57	1.70	24.80	141,439	3.32
Slovakia	1,452.67	4.80	21.50	1,041,595	3.49
Slovenia	1,349.44	8.40	11.70	383,410	3.88
Spain	5,909.74	7.70	38.70	186,278	4.14
Sweden	9,535.75	6.70	52.50	1,358,874	5.46
United Kingdom	55,672.85	14.90	7.00	696,311	5.15

Source: Eurostat.

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MEASURING THE EFFECTS OF BREXIT USING EVENT STUDY METHODOLOGY

Utvrđivanje efekata Bregzita primenom metodologije studije događaja

Abstract

The aim of the paper is to determine the effects of the results of the UK EU membership referendum on stock prices on the London Stock Exchange. The event study methodology is used to quantify the effects and determine the statistical significance of the conducted test. The research was carried out on the sample of 167 stocks listed on the London Stock Exchange, classified into five groups by the company business sector. Given the high level of integration of EU economies, the referendum outcome is expected to show negative effects. As a general conclusion, the conducted tests confirm the assumptions regarding the expected effects. Consistent results of parametric and non-parametric tests in three of the five observed sectors (financial, technology, and food) confirm the relevance of the results obtained. Parametric tests show statistical significance of negative effects on energy companies, but non-parametric tests do not confirm these results. Statistical significance of the referendum outcome regarding medical companies' return has not been determined.

Keywords: *event study, abnormal return, market return, parametric tests, non-parametric tests.*

Sažetak

Predmet rada je utvrđivanje efekata rezultata referenduma u Velikoj Britaniji o ostanku u Evropskoj uniji na kretanje cena akcija na Londonskoj berzi. Za kvantifikovanje efekata i utvrđivanje statističke značajnosti testa korišćena je metodologija studije događaja. Istraživanje je sprovedeno na primeru 167 akcija listiranih na Londonskoj berzi, grupisanih u 5 uzoraka prema sektoru poslovanja kompanije. Imajući u vidu visok stepen integrisanosti privreda zemalja Evropske unije, očekivan je negativan efekat ishoda referenduma. Generalni zaključak je da su testovi pokazali opravdanost pretpostavki u vezi sa očekivanim efektima. Konzistentni rezultati parametarskih i neparametarskih testova u tri od pet posmatranih sektora (finansijskom, tehnološom i prehrambenom) potvrda su relevantnosti dobijenih rezultata. Parametarski testovi su pokazali statističku značajnost negativnih efekata na kompanije energetskog sektora, ali neparametarski testovi nisu potvrdili ove rezultate. Nije utvrđena statistička značajnost ishoda referenduma na kretanje prinosa kompanija sektora medicinskih usluga.

Ključne reči: *studija događaja, ekstra prinos, tržišni prinos, parametarski testovi, neparametarski testovi.*

Introduction

Event study methodology is used for the purpose of analyzing the impact of an individual event on return on stocks. This methodology measures the statistical significance of a positive or negative deviation of return on stocks from the predicted trend. Applying event study to a selected stock portfolio makes sense, because the obtained results allow for broader conclusions. This methodology relies on the assumption of market rationality of economic entities, which is why it is considered that the event will immediately be reflected in the stock price trend on the stock exchange.

The aim of the paper is to determine the effects of the UK referendum results using event study methodology. This event is widely known as Brexit. The research will be carried out on the sample of 167 stocks listed on the London Stock Exchange (LSE), classified into five groups according to the company business sector. The paper aims to test the existence of a statistically significant effect of the referendum outcome on return on stocks selected from different sectors.

By passing the European Union Referendum Act (UK Parliament, 2015), the issue of deciding on the UK's stay in the EU through a referendum was raised. The referendum was held on 23 June 2016 in all constituent parts of the United Kingdom, including Gibraltar. Next morning, preliminary referendum results hinted at the clear lead of the option to leave the EU, and, later that day, it became clear that this option had won. The final results showed a very small difference between the two options: 51.9% of votes for exit and 48.1% of votes for staying in the EU. Based on the referendum results, the government is obliged to initiate negotiations on leaving the EU in accordance with Article 50 of the Treaty on the Functioning of the European Union.

The effects of such a referendum outcome have undoubtedly had a significant influence on the economy and political relations of the EU countries. Shortly before the referendum, surveys highlighted a small difference in the final outcome, but they all gave priority to the stay option [9], [25]. The assumption is that stocks reacted strongly in view of the EU member states' interconnected economic flows. The indicators of a strong reaction are the turbulent events in the days following the referendum, which included the fall of the government [38], the announcement of the Scottish independence re-referendum [40], and a petition to repeat the referendum [8].

The first part of the paper gives an overview of previous event studies on political events. Event study methodology is most commonly used in the analysis of economic events, although many authors have so far used it to analyze the impact of election results on the financial market. This paper is part of pioneering efforts to measure the impact of referendum outcome on stock prices. The second part of the paper provides the sample structure and explains event study methodology, the starting research hypotheses, and the methodology used in the paper. The research results are presented in the third part, followed by the final evaluation of the referendum effect on stock prices.

Literature review

A great number of studies prove the existence of abnormal return caused by political events (elections in the first place). In [26], a market reaction to presidential election results in the USA was analyzed over a long period of time and it was concluded that it depended on whether the winner was a Republican or a Democratic candidate. The results of this analysis indicate that the global market grows after the victory of the Republican Party candidates and shrinks after the victory of the Democratic Party candidates. In another analysis of market reaction to Republican Party victories [31], it was concluded that the market grew after their victory, while in the case of the Democrats' victory, the market grew until the election itself, but experienced a decline afterwards. One comparative analysis of the presidential election effects in the United States and Great Britain covered a period of as many as 7 decades. The analyses conducted within it did not employ the event study methodology, but the GARCH method [22]. A regression analysis of the impact of Ronald Reagan's 1980 victory on military companies' stock prices had positive results [32]. Barack Obama's victory at the 2008 election produced a negative impact on the financial sector stocks

[27]. A comprehensive study of the 1992 U.S. election effects on as many as 74 different sectors revealed a statistically significant effect in 15 sectors [18]. There were also two analyses of George Bush Junior's victory over Al Gore in 2000 [20], [37].

Several studies analyzed the referendum impact, primarily focusing on the character of internationalization and overflow of the referendum effect onto different markets. In the analysis of the global referendum impact on financial markets, the conclusion was that the referendum outcome positively affected the return on the U.S. and emerging markets [1]. The most pronounced negative effects on average and cumulative abnormal return in different sectors during the post-referendum period are found in financial companies and the consumer goods sector [30]. Similar results were obtained in [19], where regression analysis showed that financial companies and consumer goods companies were most exposed to possible losses. An event study analysis was applied to a number of companies listed on the LSE, concluding, surprisingly, that companies oriented toward the domestic market experienced more pronounced negative effects than companies operating internationally [28]. A cross-sectoral event study concluded that the referendum itself produced a negative effect, but that the post-referendum events gave a positive abnormal return [36]. Examination of the negative effect overflow from the British financial market to the rest of Europe revealed negative effects, but also a quick market recovery [34]. Using a detrended fluctuation analysis to examine the relationship of the European financial markets before and after Brexit, it was concluded that the European financial markets would be negatively correlated in the future [2].

Analysis procedure and methodology

Sample construction

The research objective is to test whether the outcome of the referendum significantly affected LSE stocks. Bearing in mind the high level of integration of the European Union economies, it is expected that the referendum outcome will have negative effects. Since companies react totally differently to the outcome, the market will not be viewed as a whole. The companies are divided into five groups according to the business sector. The sectors were selected using the study and the assumptions from [39] and [17], respectively. The following sectors are identified as those most likely to suffer as the result of the UK leaving the EU: financial, chemical, automotive, food, energy, technology, medical, and air transport. The idea behind the paper is to analyze only the effects on the stocks of UK-based companies, not of all listed companies of a given sector. That is why the chemical, air transport and automotive sectors are excluded from the analysis due to insufficient number of companies meeting the requirements for an unbiased analysis. The final sample includes 167 companies from the financial, food, technology, energy, and medical sectors.

Applied methodology

Event study methodology was first applied in the late 1960s in the study [16]. The methodology itself was formulated in the following period [4], [5], [10], [14]. It relies on regression analysis and parametric and non-parametric statistical tests. The essence of event study lies in testing the existence of abnormal return on observed stocks over the period when a particular event produces effects. Therefore, it is important for the research to precisely and irreversibly define the event, to determine whether it was expected or unexpected and carefully select stocks to be monitored and tests to be performed.

In the analysis, it is important to select an event whose effects on return on stocks will be isolated. Since a certain period of market research before the event itself is required in order to determine normal return, it would not be appropriate to choose an event preceded by one or more other significant events that could affect return. Since a longer period of time has been chosen to determine normal return, the effects of minor events could be mutually compensated, enabling an unbiased statistical conclusion to be made. Generally, the inclusion of as many stocks as possible in the survey gives more reliable results. However, companies whose stocks are not traded for more than 2 consecutive days are not suitable because they lead to statistical bias.

After the selection of the event, the effects of which will be subject to analysis, and the definition of the set of stocks to be analyzed, it is necessary to determine the estimation window, the event window, as well as normal and abnormal return. The estimation window is a time period (2 to 8 months) without turbulent events that could significantly disturb the market. In this period, numerous events that affect the stocks of individual companies or a group of companies on a daily or weekly basis are compensated [35, p. 2]. It is necessary to monitor the daily return on each stock during the estimation window, as well as the daily return on a market indicator (usually the market index) in order to determine normal return. Some scholars [3] prefer the analysis with estimation windows of different lengths (for example, 2, 4, 6, and 8 months), while other authors choose a longer estimation window (for example, 8 months). A too short estimation window poses the risk of estimating normal return on the basis of a too short period, where a minor event may have a key impact if it remains uncompensated, leading to a biased statistical conclusion. The risk of an estimation window being too long is that it would pick up too many events over a long period of time and again lead to a biased decision. A long estimation window is also a precondition for the variation measurement formulas to be valid with different categories of abnormal return.

Due to a long estimation window, a regression analysis can determine the predicted return, i.e., the market trend of an individual stock. The predicted return might not be positive –it may also have a negative value if the stock value has fallen during the observed period. This is a necessary value for determining abnormal return, which quantifies the event effects on the market. Abnormal return is determined as the difference in historical return generated during the event window and the predicted return for this period [11]. Abnormal return may not necessarily be positive either – if it is an event that leads to a reduction in the company value, abnormal return will be negative.

If the event is expected, the event window will cover several days before the event itself and fewer afterwards, because the effects of the upcoming event are felt even before it happens. If the event is unexpected, the event window will cover fewer days before the event itself and more after it, because unexpected events are later felt on the market. For research purpose, in this paper an asymmetric four-day event window is constructed (i.e., $T_0 - T_{+3)}$. Estimation window will cover 6 months, which period was determined arbitrarily based on different experiences from previous studies.

In order to determine abnormal return, normal return should first be determined. There are several models for determining normal return [24, pp. 17-19]. After a deeper analysis of the differences and potentials of each model [6], the market model, which is most commonly used in practice, will be applied in the paper. For any stock *i*, the market model is:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad (1)$$

where R_{it} is the return on security (stock) *i* in time *t* belonging to the estimation window, R_{mt} is the return on market indicator (usually the market index) in the same time period, andis, statistically speaking, a random error or effect of residual factors (the mentioned possibility that individual factors at the daily level have a strong influence on the daily trend of return on stock), which has the expected value $E(\varepsilon_{it}) = 0$ and variance $var(\varepsilon_{it}) = \sigma_i^2$, i.e., has normal distribution. α_i and β_i are market model parameters and are obtained by the regression of market return on each stock to return on a market indicator.

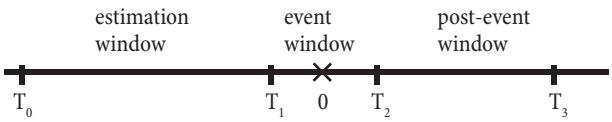
In order to determine abnormal return, the first thing one should do is calculate the expected return for each stock during the event window, using the market model methodology [35]. Once obtained, the expected return $E(R_i)$ will be used to test the existence of abnormal return:

$$AR_{it} = R_{it} - E(R_{it}) \quad (2)$$

$$Var(AR_{it}) = \sigma_{\varepsilon i}^2 \quad (3)$$

where AR_{it} is abnormal return on stock *i* on day *t* belonging to the event window, R_{it} is the return on stock *i* on that day, and $E(R_{it})$ is the expected return on the same stock on that day, with estimation constructed on the basis of a market model. In practice, abnormal return will always exist, but the question is whether it will be statistically significant or not. One should pay attention to Figure 1: *t* in formula (1) is between T_{0+1} and T_1 (this period is denoted by L_1), and in formula (2) it is between T_1 and T_2 (this period is denoted by L_2), where 0 denotes the event day.

Figure 1: Time dimension of the event study



Source: [7].

For the needs of the analysis, abnormal return shall not refer to individual stocks, but aggregation will be carried out. Aggregation can be done in several ways: it can be done at the level of each day of the event window, where the average abnormal return for the day t, $\overline{AR}_t$, can be determined as:

$$\overline{AR}_t = \frac{1}{N}\sum_{i=1}^{N} AR_{it} \quad (4)$$

$$Var\,(\overline{AR}_t) = \frac{1}{N^2}\sum_{i=1}^{N}\sigma_{\varepsilon_i}^2 \quad (5)$$

The second approach to aggregation is at the level of individual stocks over several days of the event window and most often covering all days of the event window, resulting in a cumulative abnormal return on stock i, CAR_i:

$$CAR_{i(t_1,\,t_2)} = \sum_{t=t_1}^{t_2} AR_{it}, T_1 < t_1 \le t_2 \le T_2 \quad (6)$$

$$Var(CAR_{i(t_1,\,t_2)}) = \sigma^2_{i(t_1,t_2)} = (t_2 - t_1 + 1)\,\sigma_{\varepsilon_i}^2 \quad (7)$$

Finally, average cumulative abnormal return, $\overline{CAR}$, can be determined. One should keep in mind that CAR and $\overline{CAR}$ do not have to be calculated only for the entire event window, but can also be calculated for two individual or several consecutive days.

$$\overline{CAR}_{(t_1,t_2)} = \frac{1}{N}\sum_{i=1}^{N} CAR_{i(t_1,t_2)} \quad (8)$$

$$Var(\overline{CAR}_{(t_1,t_2)}) = \frac{1}{N^2}\sum_{i=1}^{N}\sigma^2_{i(t_1,t_2)} \quad (9)$$

Derivation of all categories of abnormal return at all aggregation levels with variation measures can be found in [10], [15], [35]. The condition for (3), (5), (7), and (9) is a high value of L_1, with which the variance formulas are reduced to a given form [24, p. 21]. For the purpose of the analysis, we will also need a standardized cumulative abnormal return – $SCAR_i$, which is standardized for each individual stock by dividing the value of CAR_i with the standard deviation of the corresponding stock:

$$SCAR_{i(t_1,t_2)} = \frac{CAR_{i(t_1,t_2)}}{\sigma_i} \quad (10)$$

After determining all categories of abnormal return, it is possible to test the hypothesis of its statistical significance. It should be emphasized that two types of tests are usually applied – parametric and non-parametric. The requirement for the application of parametric tests is a normal distribution of test statistics, which a sufficiently large sample (N> 30) meets. For non-parametric tests this condition is not necessary, which is why non-parametric tests are recommended in the analysis of small financial markets. As regards parametric tests, the t-test, J_1 and J_2 tests will be applied, while non-parametric test will include J_3 (Sign test) and J_4 (Corrado test).

The t-test, one of the most commonly used, tests the difference between the historical and the hypothetical value of some statistics. The zero hypothesis in the case of the t-test is the absence of statistically significant abnormal return, and the alternative hypothesis rejects the zero hypothesis:

$$H_0 : \overline{AR} = 0, H_1 : \overline{AR} \neq 0 \text{ or } H_0 : \text{CAR} = 0, H_1 : \text{CAR} \neq 0 \quad (11)$$

Equation (11) shows that the t-test makes it possible to test average abnormal return for each day or cumulative abnormal return for each observed stock. For practical reasons it is far simpler to use the first variant because it yields a far smaller number of results, allows for transparency and makes it easier to draw a conclusion at the level of the sector. Also, the t-test can be one-tailed, i.e., the alternative hypothesis may contain greater than or less than symbols in place of the inequality symbol, when one explicitly wants to test whether the observed event leads to positive or negative abnormal return. In this paper, the alternative hypothesis will be two-tailed, because it tests the existence of abnormal return, without a priori determining whether it is positive or negative. The formula for the t-test statistics is:

$$t = \frac{\overline{AR}_t - AR_0}{S/\sqrt{N}} \quad (12)$$

Since the hypothetical value is $AR_0 = 0$, t-statistics will be obtained by dividing the average abnormal return on a particular day by the standard deviation quotient of the entire sample during the estimation window (according to [33, p. 9]) and the root of the number of stocks considered.

Since this is a two-tailed test, the critical value for rejecting the zero hypothesis is ± 1.96 with a confidence level of 95%.

The remaining two parametric tests, J_1 and J_2, give uniform results at the level of the entire event window. J_1 tests the value, and J_2 the value, which presents the average of all values for all observed stocks. The zero hypothesis is that and values are not statistically significantly different from 0, and alternative hypothesis rejects the zero hypothesis.

$$H_0 : \overline{CAR} = 0, H_1 : \overline{CAR} \neq 0,$$
$$\text{and } H_0 : \overline{SCAR} = 0, H_1 : \overline{SCAR} \neq 0 \quad (13)$$

$$J_1 = \frac{\overline{CAR}_{(t_1,t_2)}}{\sqrt{\overline{\sigma}^2_{i(t_1,t_2)}}} \quad (14)$$

$$J_2 = \sqrt{\left(\frac{N(L_1-4)}{L_1-2}\right)}\,\overline{SCAR}_{(t_1,t_2)} \quad (15)$$

where t_1 and t_2 values in (14) and (15) can represent any days during the event window. However, this study will use the first and last day of the event window, i.e., J_1 and J_2 will be performed at the level of the entire event window. The critical value for these tests is also ± 1.96 with a confidence level of 95%, as they are two-tailed tests.

As regards non-parametric tests, this study will apply the Sign test and Corrado test, also specified as J_3 and J_4 tests in studies. According to [23], the Sign test examines the distribution of observed statistics around the median value. The zero hypothesis states that there is equal distribution of positive and negative values of the observed statistics around the median value, and alternative hypothesis rejects it, with the conclusion that sign distribution is not symmetric around the median value.

$$H_0 : Me = 0.5, \quad H_1 : Me \neq 0.5 \quad (16)$$

In this case, cumulative abnormal return (CAR) values will be statistically important. The CAR values for all stocks included in the analysis should be placed in the ascending order in order to find the median value of CAR by the principle (N+1)/2, where N is the number of observations. Formula for calculating J_3 is:

$$J_3 = \left(\frac{N^{+(-)}}{N} - 0.5\right)\frac{\sqrt{N}}{0.5} \quad (17)$$

N is the number of all observed stocks and $N^{+(-)}$ is the number of positive or negative values of statistics (in this case, the number of positive values of CAR). Usually the number of positive values is taken, except in the case of one-tailed tests when examining whether the observed event leads to negative abnormal return. The critical test value is ± 1.64 in the case of a two-tailed test, which will be applied in this paper.

The Corrado test or J_4 shows the return rank for each of the observed companies [12]. The observation period presents the combination of the estimation window and event window. The advantage of this kind of test over parametric tests is that only the rank of return is important for analysis, which is why extreme values do not affect the test value. This test can be performed in two ways. The first is to view the entire event window as one period, in which case CAR is ranked for each individual stock. The problem is that, in this case, the estimation window is shortened (as in this case CAR aggregates four days, four days would have to be aggregated in the estimation window too). Another way is to perform the test for each day in the event window individually, with some days showing statistical significance, and some not (similar to the t-test). The zero hypothesis is that there is equal distribution of the positive and negative values of the observed statistics around the median value, and alternative hypothesis rejects it, with the conclusion that distribution is not equal. The formula for the J_4 test is found in [13], and [21]:

$$J_4 = \frac{1}{N}\sum_{i=1}^{N}\left(K_{i0} - \frac{L_2+1}{2}\right)/S(L_2) \quad (18)$$

$$S(L_2) = \sqrt{\frac{1}{L_2}\sum_{t=T_0+1}^{T_2}\left(\frac{1}{N}\sum_{i=1}^{N}\left(K_{it} - \frac{L_2+1}{2}\right)\right)^2} \quad (19)$$

where $(L_2 + 1)/2$ is the median rank, K_{io} is the return rank on the event day, $S(L_2)$ is the standard deviation of return rank, K_{it} is the return rank of the stock *i* on the observed day *t*, $t \in L_2$. In the case of a two-tailed test, which will be applied in this paper, the critical test value is ± 1.64. The field of non-parametric tests is subject to continuous procedural and test methodology adjustments.

Results

The analysis used the asymmetric event window $T_0 - T_{+3}$, where T_0 is the event day, specifically 23 June 2016. A six-month estimation window was used to estimate market

trends, starting from 21 December 2015. The FTSE 100 Index was used as an indicator of market trends. Analysis was carried out on 167 stocks of UK-based companies listed on the London Stock Exchange. Historical data was downloaded from Yahoo! Finance, and all statistical calculations were carried out in the IBM SPSS 20.0 software package. Each day's adjusted closing price was used to determine the return, as price adjustments were pronounced.

The stocks were divided into 5 groups according to the business sector. The parametric tests performed included the t-test, J_1 and J_2, with the t-test performed for each day of the event window individually. Non-parametric tests included J_3 and J_4. The statistics of all the tests individually for each sector can be seen in Table 1. The underlined values have statistical significance.

The performed tests show a strong negative effect of the referendum results on the stocks of all sectors except the medical sector. This confirms the assumption that the referendum outcome will significantly affect the London Stock Exchange. All parametric tests show statistical significance with high negative statistical values, with all three tests yielding the highest results from the stocks of the financial technology sectors. Regarding the t-test, in all sectors statistical significance was established on T+1 and T+2 days. On these days the t-test statistics is negative in the medical sector, but without any significance.

Non-parametric tests confirm the conclusion reached after conducting parametric tests in the financial, technology and food sectors, but not in the energy sector. The values of the J_3 test are high above the limit value, while the J_4 test shows significance on the days T_{+1} and T_{+2}. J_4 confirms the results of the t-test, as both tests show significance on the same days. Both non-parametric tests record the highest negative values in the technology sector. In the energy sector, non-parametric tests do not confirm the conclusion made after parametric tests. The reason for this can be the amplitude of AR and CAR negative values, which directly affect the values of parametric tests, but lose significance in non-parametric ones, because all values are converted to positive or negative signs (J_3) or ranks (J_4). It should be emphasized that non-parametric tests reveal a negative effect on key event days (T_{+1} and T_{+2}), but without statistical significance.

Finally, none of the tests shows significance of the negative outcome in the medical sector, and even the t-test shows statistical significance of the positive values for the days T_{+0} and T_{+3}. While this outcome could have been somewhat expected on the referendum day, a strong market recovery after two days of a very modest fall was

Table 1: Values of test statistics and sample size by sector

Sectors	Observations	Period	t-test	J_1	J_2	J_3	J_4
Food sector	25	T_0	0.670828	-4.45544	-2.33213	-3	1.08709
		T_{+1}	-3.75427				-2.30798
		T_{+2}	-2.90425				-2.18533
		T_{+3}	1.809464				1.79510
Financial sector	39	T_0	-0.58242	-12.9324	-15.9739	-4.0032	0.88379
		T_{+1}	-4.73065				-2.47423
		T_{+2}	-5.33068				-2.57068
		T_{+3}	0.09178				0.86214
Energy sector	34	T_0	-0.19962	-2.79376	-3.19015	-1.37199	0.27948
		T_{+1}	-0.70834				-0.09561
		T_{+2}	-2.00118				-0.66928
		T_{+3}	-0.09256				-0.26232
Medical sector	32	T_0	3.140431	0.095587	0.825923	0.353553	1.37914
		T_{+1}	-1.7021				-1.62268
		T_{+2}	-1.40802				-0.96321
		T_{+3}	2.830032				1.76497
Technology sector	37	T_0	1.087971	-10.14	-12.7536	-4.75757	0.74227
		T_{+1}	-4.70252				-3.28795
		T_{+2}	-6.46533				-4.06884
		T_{+3}	0.337088				0.16440

Source: Authors' analysis based on research.

not expected. J_4 confirms the statistical significance of recovery on day T_{+3}.

Conclusion

The general conclusion is that the tests confirmed the assumptions regarding the expectation of the negative referendum effects on the London Stock Exchange. Consistent results of parametric and non-parametric tests in three of the five observed sectors confirmed the relevance of the results obtained. There is room for further analysis only in the energy sector, where non-parametric tests did not confirm the statistical significance of parametric tests. Given the claim above stating that parametric tests depend on the amplitude of negative effects, it could be concluded that a different selection of companies would yield different results. However, having in mind the size of the sample and the total number of companies in this sector registered on the London Stock Exchange, this assumption can be ignored. All relevant companies registered in the UK are included in the analysis which is why the results can be considered relevant. The absence of statistical significance of the stocks of medical companies is a clear indication of the relative strength of this sector in comparison with others.

The choice of the portfolio and event window construction can always be considered possible research limitations. Nevertheless, in the light of earlier assumptions about the referendum impact, the selection of these sectors can be considered justified. In the future, it would be possible to carry out a comparative analysis of the reaction of one or more sectors within different stock exchanges, and include, besides London, the Paris Stock Exchange, Frankfurt Stock Exchange, and New York Stock Exchange. It would be interesting to compare the results of European stock exchanges with New York, potentially obtaining the result of statistically significant trends in opposite directions.

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THE LEVEL OF DEVELOPMENT AND SIGNIFICANCE OF ENTREPRENEURSHIP AND SMES IN SERBIA AND SELECTED EU COUNTRIES FROM THE REGION

Razvijenost i značaj preduzetništva i MSP u Srbiji i izabranim zemljama EU iz okruženja

Abstract

Starting from the role and importance of entrepreneurship and SMEs for economic growth and employment, the aim of this research is to explore the achieved level of development of entrepreneurship and SMEs in Serbia and selected EU countries from the region, based on the Global Entrepreneurship Index in 2018, and the development of SMEs in Serbia and selected EU countries from 2009 to 2017. The research on the development of SMEs was conducted through a comparative analysis of the performance of SMEs in the non-financial business sector in Serbia and five selected EU countries from 2009 to 2017, contribution of SMEs to the evolution – recovery and expansion of or decline in employment and value added in Serbia and selected EU member states from 2009 to 2017, as well as through analysis of SME development in Serbia and selected EU countries in 2009 and 2017 on the basis of the value of SME development index in the previously mentioned years. The obtained results served as the basis for assessing the effectiveness of the development policy, i.e., the policy aimed at encouraging the development of SMEs in Serbia in comparison with the reference EU countries from the region, and for making proposals for improving the existing and/or adopting a new SME development policy in Serbia.

Keywords: *entrepreneurship, SMEs, economic growth, employment, SME development policy.*

Sažetak

Polazeći od uloge i značaja preduzetništva i MSP za ekonomski rast i zaposlenost, cilj ovog rada je da istraži dostignuti nivo razvijenosti preduzetništva i MSP u Srbiji i izabranim zemljama EU iz okruženja, na osnovu vrednosti Indeksa globalnog preduzetništva u 2018. godini i razvoja MSP u Srbiji i izabranim zemljama EU iz okruženja od 2009. do 2017. godine. Istraživanje razvijenosti MSP sprovešće se kroz komparativnu analizu performansi MSP u nefinansijskom poslovnom sektoru u Srbiji i odabranim zemljama EU iz okruženja od 2009. do 2017. godine, analizu doprinosa MSP promeni – oporavku i rastu ili padu zaposlenosti i dodate vrednosti u Srbiji i izabranim zemljama EU od 2009. do 2017. godine, kao i kroz analizu razvijenosti MSP u Srbiji i izabranim zemljama EU u 2009. i 2017. godini na osnovu vrednosti Indeksa razvijenosti MSP u 2009 i 2017. godini. Dobijeni rezultati poslužiće kao osnova za ocenu uspešnosti razvojne, odnosno politike podsticanja razvoja MSP u Srbiji u poređenju sa referentnim zemljama EU iz okruženja i davanje predloga za unapređenje postojeće i/ili donošenje nove politike razvoja MSP u Srbiji.

Ključne reči: *preduzetništvo, MSP, ekonomski rast, zaposlenost, politika razvoja MSP.*

Introduction

Small and medium-sized enterprises (SMEs) are important drivers of economic growth and employment around the world. The role of entrepreneurship has changed dramatically and fundamentally – it became an important factor for employment, economic development and international competitiveness in the global economy [8, p. 9]. Economic growth and employment are driven by not only large and well-established companies, but also by small and new enterprises [1]. SMEs and entrepreneurs serve as a catalyst for economic growth and employment [5]. Through successful innovation, SMEs increase revenue, create new consumer needs (new market niches) and satisfy the existing ones better, make connections and collaborate, thereby reducing the advantage of large companies resulting from the size of available resources and opportunities for achieving economies of scale [13, p. 247].

Bad situation concerning unemployment and slow economic growth forced economists to try to find a solution to this problem through entrepreneurship and self-employment [21, p. 48]. OECD survey from 2010 showed that "small and medium-sized enterprises absorb the workforce which is released during the decline in activity in other parts of the economy" [17, p. 24], and Lerner came to a conclusion that "in proportion to their size, small businesses create more jobs than large companies and have the advantage of creating radical innovations" [16]. Also, OECD experts say that "in the short and medium term, there is a real possibility to use policies that will contribute not only to raising productivity but also creating new jobs at the same time by encouraging entrepreneurship and innovation of small and medium-sized enterprises" [17, p. 25]. This is why it is not surprising that a large number of "researchers have recently focused on exploring the links between entrepreneurship and SMEs and economic growth and employment" [4]. Also, in an attempt to support SME development aiming to prompt economic growth and employment, many governments introduce an active development policy and extensive reforms to increase productivity, human capital and company level performance. Active SME policy comprises horizontal and targeted policies. Horizontal policies are designed to improve the operational environment for all enterprises, such as regulatory simplification and improvement in the regulatory framework for access to finance. Targeted policies are related to specific segments of the enterprise population, such as innovative enterprises, start-ups or export-oriented enterprises [19, p. 18].

When it comes to entrepreneurship and SMEs, it should be emphasized that these are related, but not identical concepts. An entrepreneur is thought to be a person with a vision, capable of bringing a new idea to the market. Thus, in order to improve the general well-being, entrepreneurs are creating jobs, developing new solutions to problems, improving efficiency, and exchanging ideas globally [3, p. 5]. In this way, they connect invention and commercialization because invention without entrepreneurship remains in the university lab or R&D facility [3, p. 17]. Similarly, Carree and Thurik consider that entrepreneurs are the main drivers of the firm's creation process in which young and small firms participate. However, the force of entrepreneurship at a level of a country, region or industry became a phenomenon of firm creation and turbulence [6]. So, from all the previously mentioned facts it can be deduced that the most important thing for entrepreneurs is innovation which creates jobs and generates economic growth [3, p. 17].

The development, role and importance of entrepreneurship and SMEs for economic growth and employment in the modern economy are current areas of theoretical and practical research of a large number of foreign and domestic authors and professional institutions. Accordingly, this paper examines the development and importance of entrepreneurship and SMEs in Serbia and five selected EU countries from the region. As it covers a complex field of research, the work consists of several research areas. In the first part, the description of the methodological approach and database is followed by the analysis of the level of development of entrepreneurship in Serbia and selected EU countries from the region based on the Global Entrepreneurship Index in 2018. In the second part, the research on the development of SMEs in Serbia and selected EU countries from 2009 to 2017 was conducted through comparative analysis of the performance of SMEs in the non-financial business sector (NFBS) in Serbia

and selected EU countries in the same period, and the contribution of SMEs to the evolution – recovery and expansion of or decline in employment and value added in Serbia and selected EU member states from 2009 to 2017, as well as the analysis of SME development in Serbia and selected EU countries in 2009 and 2017 on the basis of the value of SME development index in those years. The main goal of analyzing the defined areas is to evaluate the development and importance of SMEs for economic growth and employment and assess the success of such development, that is, the policy aimed at stimulating the development of entrepreneurship and SMEs in Serbia in comparison with the EU reference countries from the region, and to provide guidelines for improvement of the given policy with the aim of accelerating development of domestic economy by strengthening and developing domestic SMEs.

Methodological approach and database

In recent years, researchers have attempted to create several entrepreneurial indicators; however, they have not been able to explain the complexity of entrepreneurship and its place in the development of the economy. To overcome this problem, starting from the understanding of entrepreneurship as a dynamic, institutionally embedded interaction between entrepreneurial perspective, potential and desires by individuals, which drives resource allocation through the creation and operation of new ventures [2, p. 479], the Global Entrepreneurship and Development Institute based in Washington created the Global Entrepreneurship Index as the first, and currently the only, complex measure of the national-level entrepreneurial ecosystem that reflects the miscellaneous nature of entrepreneurship [3, p. 43].

The Global Entrepreneurship Index (GEI) is a composite indicator of the entrepreneurial ecosystem conditions in a given country and it measures both the quality of entrepreneurship and the extent and depth of the supporting entrepreneurial ecosystem [3, p. 3]. GEI is composed of three characteristics or sub-indices: entrepreneurial attitudes, entrepreneurial abilities, and entrepreneurial aspirations, and covers 14 areas (pillars) of the entrepreneurial ecosystem [3, p. 13]. Each of them contains an individual and an institutional variable that corresponds to the micro- and the macro-level aspects of entrepreneurship [3, p. 33]. In this paper, the development of entrepreneurship in Serbia and selected EU countries from the region is analyzed on the basis of the GEI value, since this index is "a starting point for discussion about improving entrepreneurial ecosystems, and is an important tool to help countries accurately assess and evaluate their ecosystem to create more jobs" [3, p. 16].

Unlike entrepreneurship, which is a multidimensional phenomenon whose exact meaning is difficult to identify and measure, small and medium-sized enterprises (SMEs) have a simpler definition. Small and medium-sized enterprises are non-subsidiary, independent firms employing less than 250 employees; their turnover should not exceed EUR 50 million or the balance sheets of medium-sized enterprises should not exceed EUR 43 million [18, p. 17]. They consist of three different categories of enterprises – micro, small and medium-sized enterprises. The official European Commission's (EC) definition of SMEs focuses on three different factors (level of employment, level of turnover, and size of the balance sheet) [10, p. 13]. Nonetheless, the SME data in this analysis are based only on the definition of employment, because the main source of data for this research was the Structural Business Statistics (SBS) database maintained by Eurostat. The SMEs in the non-financial business sector (NFBS) represent the main focus of this research, including all NACE (the statistical classification of economic activities in the European Community) sectors, with the exception of the following: Agriculture, Forestry and Fishing (section A), Financial and Insurance Activities (K), Public Administration and Defense; Compulsory Social Security (O), Education (P), Human Health and Social Work Activities (Q), Arts, Entertainment and Recreation (R), Other Service Activities (S), Activities of Households as Employers (T) and Activities of Extraterritorial Organizations and Bodies (U) [10, p. 13].

The SME development index is created in order to analyze the trend of the development of SMEs in Serbia and selected EU countries. This index is a complex economic indicator that enables comparative analysis and provides us with better insight into changing the entrepreneurial environment of SMEs. It is calculated on the basis of

business data and national accounts statistics (the so-called hard data) and is based on three economic parameters:

a) Share of SMEs in total value added in the non-financial business sector,
b) Share of SMEs in total employment in the non-financial business sector, and
c) Share of high-tech manufacturing and knowledge-intensive services in TOTAL (manufacturing + services).

SME development index can be expressed as percentage and/or GDP per capita.

The SME development index used in this paper was modeled on the Index of SME Development introduced by the UNECE in 1999. The initial Index of SME Development is based on: the share of private ownership, share of SMEs in GDP, and share of SME labor force in the total labor force of a country [24, p. 9].

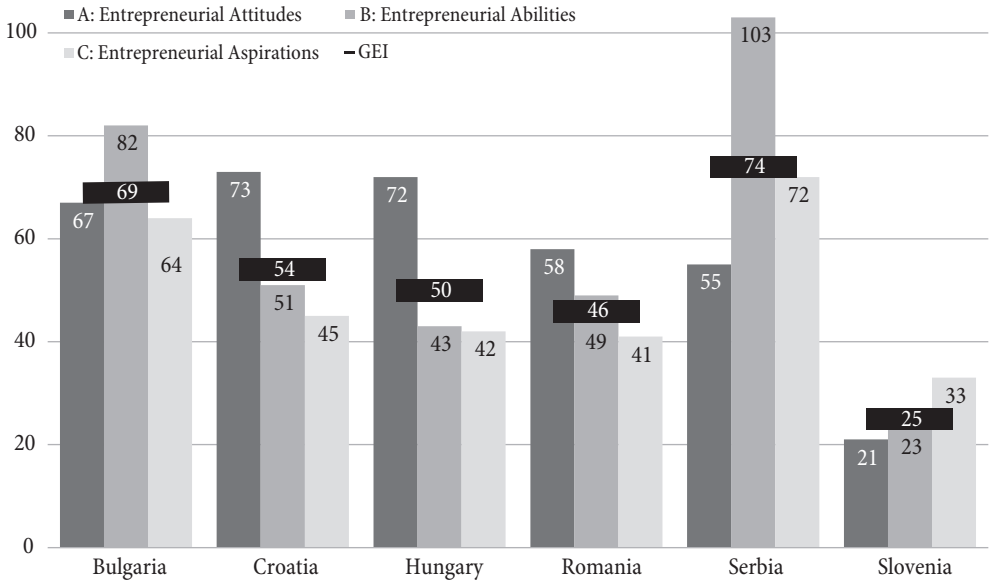
The development of entrepreneurship in Serbia and selected EU countries in 2018

As regards the development of entrepreneurship in 2018, with the Global Entrepreneurship Index value of 0.264 (on a scale of 0 to 1) Serbia occupies the 74th place out of 137 analyzed countries and is ranked worse than the five selected member states of the European Union from the region (Bulgaria, Croatia, Hungary, Romania, and Slovenia).

Compared to the selected EU countries from the region, Serbia ranks relatively well with regard to the Entrepreneurial Attitudes sub-index (its ranking is only worse than the one of Slovenia which holds the 21st place out of 137 countries analyzed). Serbia finds itself in an unfavorable situation when it comes to the pillar that measures Entrepreneurial Aspirations (Serbia is 72nd out of 137 countries and is lagging behind other countries), while the worst situation is reflected in the pillar that measures Entrepreneurial Abilities, where Serbia holds the 103rd place out of 137 countries in the world, significantly lagging behind the rest of the EU countries from the region (for example, Slovenia is 23rd).

Compared to the EU countries from the region (with the exception of Slovenia), entrepreneurs in Serbia are better able to see business opportunities, beginners in business have better skills necessary to start a business and connect more extensively (Networking). The development of certain aspects of entrepreneurial ecosystems in Serbia, such as Cultural Support, Human Capital, Product and Process Innovation, and Risk Capital, is at an average level in comparison to the observed EU countries from the region, while the following areas in Serbia show the biggest weaknesses: Risk Acceptance, Opportunity Startup, Technology Absorption, Competition, High Growth and Internationalization.

Figure 1: Global Entrepreneurship Index in 2018 – ranking of Serbia and the selected EU member states



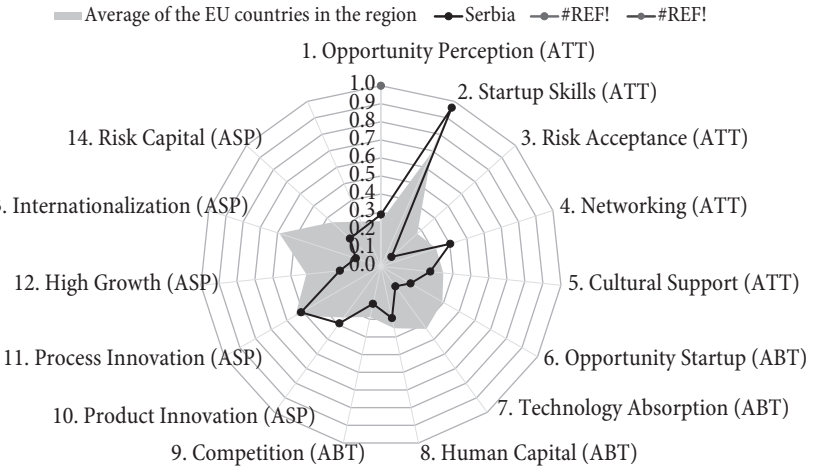
Source: Authors' own calculation and representation based on the GEI 2018 data.

Table 1: Development of the basic elements of the Global Entrepreneurship Index in 2018 - the example of Serbia and selected EU member states (darker color denotes a higher level of development)

	Opportunity Perception	Startup Skills	Risk Acceptance	Networking	Cultural Support	Opportunity Startup	Technology Absorption	Human Capital	Competition	Product Innovation	Process Innovation	High Growth	Internatio-nalization	Risk Capital
Bulgaria														
Croatia														
Hungary														
Romania														
Serbia														
Slovenia														

Source: Authors' own calculation and representation based on the GEI 2018 data.

Figure 2: Global Entrepreneurship Index 2018 – Serbia and the average of the EU countries in the region



Source: Authors' own calculation and representation based on the GEI 2018 data.

The results of the previous research indicate that the positive attitude towards entrepreneurship in Serbia has not been sufficiently included in Entrepreneurial Aspirations, and that the major constraints on the development of entrepreneurship and SME sectors in Serbia are factors that determine Entrepreneurial Abilities.

The fact that domestic entrepreneurs are well aware of business opportunities, possess the necessary skills needed to start their business and are ready for networking, suggests that activities to promote entrepreneurship and the development of the non-financial support systems, especially in the field of formal (higher education) and informal (trainings for entrepreneurs) education, have been relatively successful, since they have greatly helped entrepreneurs, beginners and owners of already existing SMEs to make realistic estimates of business opportunities in the market, to develop their entrepreneurial and managerial skills, as well as to recognize the importance and potential of networking – better linking of entrepreneurs among themselves and with other participants in the economy (for example: linking to clusters, linking with large companies in value chains, etc.) in order to improve their entrepreneurial activity.

The development of SMEs in Serbia and selected EU countries from 2009 to 2017

Comparative analysis of the performance of SMEs in the non-financial business sector in Serbia and selected EU countries from 2009 to 2017

In 2017, 315,307 SMEs (almost all Serbia's NFBS enterprises – 99.8%) operated in the Serbian non-financial business sector. These companies employed 808,299 workers (two-

Table 2: Values of the Global Entrepreneurship Index of Serbia and selected countries from the region in 2018

	Bulgaria	Croatia	Hungary	Romania	Serbia	Slovenia	Average
GEI	**0.278**	**0.340**	**0.364**	**0.382**	**0.264**	**0.538**	**0.361**
A: Entrepreneurial Attitudes	**0.288**	**0.273**	**0.276**	**0.322**	**0.324**	**0.544**	**0.338**
1. Opportunity Perception	0.143	0.181	0.286	0.254	0.287	0.349	0.250
2. Startup Skills	0.513	0.764	0.338	0.563	0.962	1.000	0.690
3. Risk Acceptance	0.189	0.102	0.167	0.243	0.078	0.843	0.270
4. Networking	0.440	0.252	0.309	0.192	0.402	0.331	0.321
5. Cultural Support	0.262	0.269	0.321	0.451	0.275	0.504	0.347
B: Entrepreneurial Abilities	**0.246**	**0.333**	**0.375**	**0.348**	**0.198**	**0.550**	**0.342**
6. Opportunity Startup	0.299	0.476	0.476	0.310	0.190	0.604	0.393
7. Technology Absorption	0.273	0.527	0.428	0.461	0.136	0.744	0.428
8. Human Capital	0.232	0.191	0.475	0.412	0.293	0.500	0.351
9. Competition	0.207	0.299	0.241	0.274	0.212	0.485	0.286
C: Entrepreneurial Aspirations	**0.300**	**0.415**	**0.441**	**0.476**	**0.271**	**0.521**	**0.404**
10. Product Innovation	0.204	0.200	0.360	0.470	0.391	0.480	0.351
11. Process Innovation	0.594	0.591	0.429	0.344	0.509	0.806	0.546
12. High Growth	0.268	0.484	0.572	0.506	0.228	0.427	0.414
13. Internationalization	0.325	0.899	0.749	0.675	0.145	0.747	0.590
14. Risk Capital	0.223	0.350	0.374	0.675	0.230	0.333	0.364

Source: Authors' own calculation and representation based on the GEI 2018 data.

Table 3: Number of SMEs in the non-financial business sector in Serbia and selected EU countries in 2017 and their employment and value added

	Bulgaria	Croatia	Hungary	Romania	Serbia	Slovenia
Enterprises						
Number (in 000)	337	149	558	481	315	142
Share (in %)	99.8	99.7	99.8	99.7	99.8	99.8
SME density	55	42	67	29	54	81
Employment						
Number (in 000)	1,487	696	1,884	2,701	808	441
Share (in %)	75.4	68.1	68.8	65.8	65.1	73.4
Average employment per enterprise	*4.4*	*4.7*	*3.4*	*5.6*	*2.6*	*3.1*
Value added						
Value in € (in billions)	16.8	14.2	33.5	33.9	10.2	14.6
Share (in %)	65.2	60.8	53.7	51.3	55.6	65.1
Value added/Number of enterprises (in 000)	*49.7*	*95.2*	*60.0*	*70.4*	*32.3*	*102.7*
Productivity (in 000)	*11.3*	*20.5*	*17.8*	*12.5*	*12.6*	*34.1*

Source: Authors' calculations based on the data from Eurostat, the Statistical Office of the Republic of Serbia and DIW Econ.

thirds of total employment – 65.1%) and created 10.2 billion, slightly less than three-fifths (55.6%) of the value added generated by the non-financial business sector.

In Serbia, there are twice as many SMEs compared to Slovenia and Croatia, but fewer than in Bulgaria, Romania and Hungary. SME density (number of SMEs per 1,000 inhabitants) in Serbia is higher than in Romania and Croatia, roughly the same as in Bulgaria, but it is significantly lagging behind Hungary and Slovenia.

Compared to SMEs from Serbia, SMEs from Romania, Hungary and Bulgaria employ more workers, while SMEs from Serbia employ more workers than those from Croatia and almost twice as much as SMEs from Slovenia. However, when looking at the number of workers per enterprise, SMEs from Serbia have lower employment than SMEs from Romania, Croatia, Bulgaria, Slovenia and Hungary. Also, SMEs from Serbia contribute less to employment in the non-financial business sector in 2017 compared to SMEs from other EU countries from the region, which points to smaller importance of SMEs in Serbia in terms of employment compared to other countries observed.

Even though there are a lot of SMEs in Serbia employing more workers than SMEs from Slovenia and Croatia, SMEs from Serbia create lower value added

Figure 4: Number and participation of employees from SMEs in NFBS employment in Serbia and selected EU countries

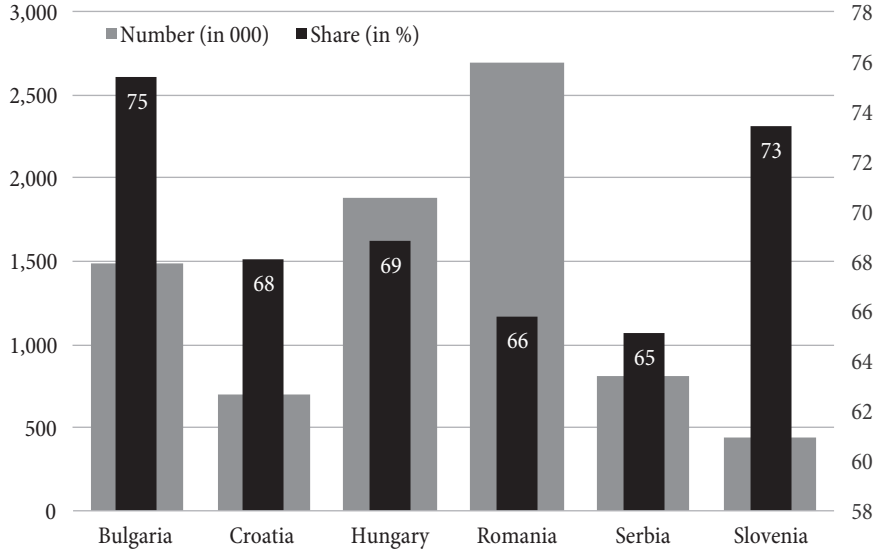
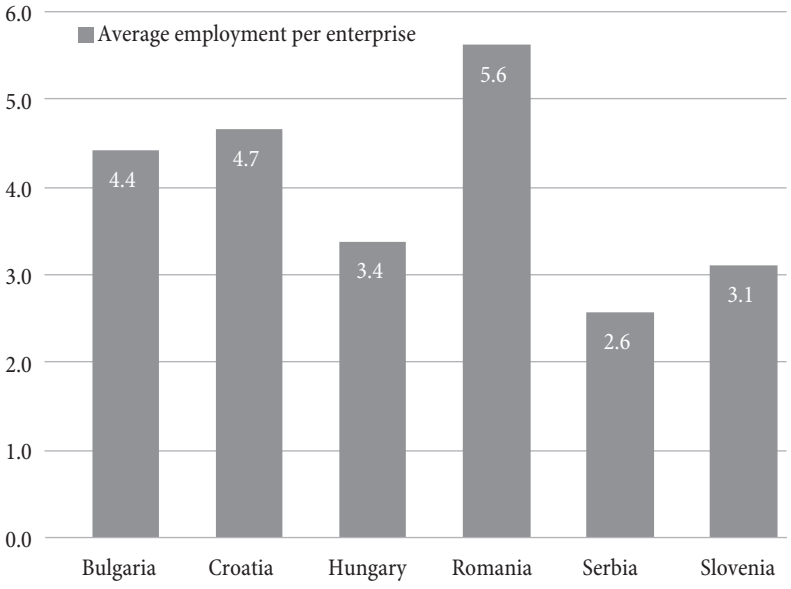


Figure 5: Average employment per SME in NFBS in Serbia and selected EU countries

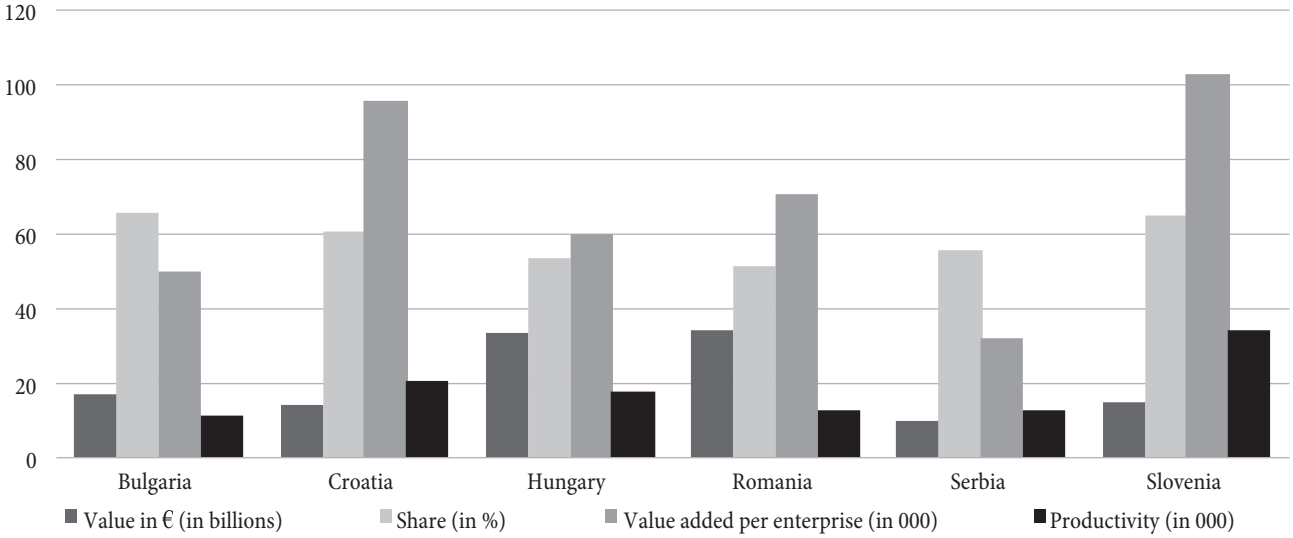


Source: Authors' own and representations based on the data from Eurostat, the Statistical Office of the Republic of Serbia and DIW Econ.

compared to SMEs from the observed EU member states in the region. We see a more favorable situation in SME participation in the creation of value added in the non-financial business sector, since SMEs from Serbia have a higher share than SMEs from Romania and Hungary, but lower than SMEs from Croatia, Slovenia and Bulgaria. Furthermore, SMEs from Serbia are more productive (value added/employment) than SMEs from Bulgaria and Romania, although they have lower productivity than SMEs from Hungary, Croatia and Slovenia.

A significant indicator of the development of SMEs is their knowledge or technology intensities. Therefore, there is a great policy interest in encouraging SMEs to become more innovative, due to the fact that many of them are in sectors characterized by either low knowledge or technology intensities [10, p. 19]. In Serbia, as well as in the selected EU countries, less than one-third of SMEs, in terms of the number of SMEs in the non-financial business sector, and less than one-fourth of SMEs, in terms of employment and value added in the non-financial business sector, were

Figure 6: Value added, participation, value added per enterprise and productivity of SMEs from the non-financial business sector in Serbia and selected EU countries from the region



Source: Authors' own calculation and representation based on the data from Eurostat, the Statistical Office of the Republic of Serbia and DIW Econ.

Table 4: Distribution of SMEs from Serbia and selected EU countries in terms of value added, employment and number of enterprises across sectors of different knowledge and technology intensities

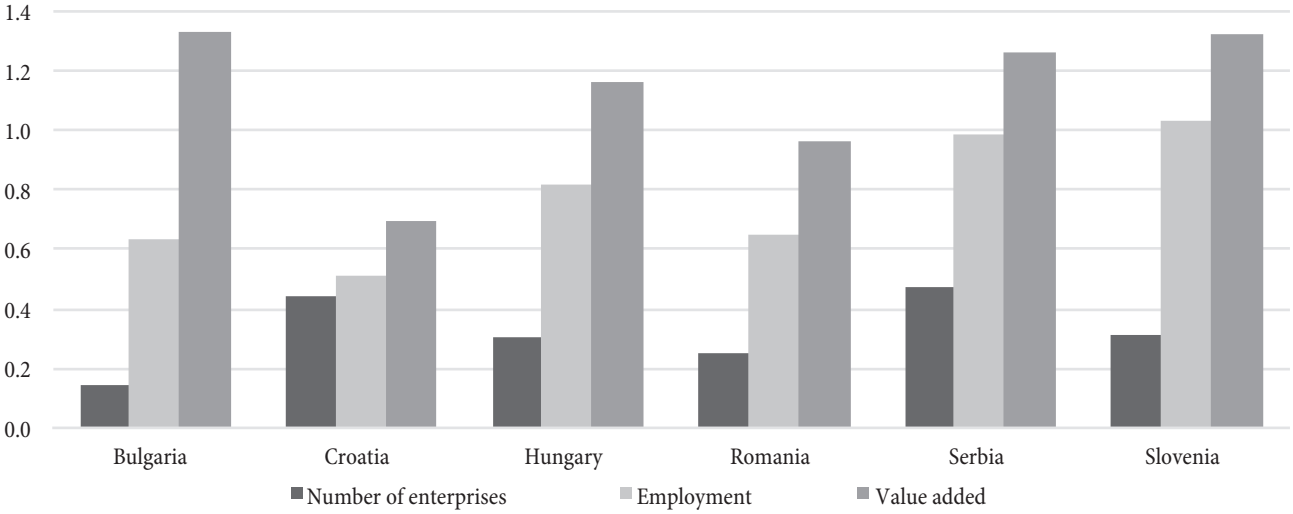
		High-tech industries		Medium-tech industries		Low-tech industries		Knowledge-intensive services		Less knowledge-intensive services		TOTAL manufacturing + services	
		value	%	value	%	value	%	value	%	value	%	value	%
Number of enterprises (in 000)	Bulgaria	0.5	0.1	12	3.8	20	6.3	60	18.9	224	70.9	316	100
	Croatia	0.6	0.4	9	7.0	10	8.0	31	23.6	79	60.9	130	100
	Hungary	1.5	0.3	23	4.8	26	5.3	174	36.0	260	53.7	485	100
	Romania	1.1	0.3	19	4.5	33	7.9	90	21.3	278	66.1	421	100
	Serbia	1.4	0.5	19	6.8	35	12.1	60	21.0	171	59.7	287	100
	Slovenia	0.4	0.3	10	8.6	9	7.9	44	36.1	57	47.1	121	100
Employment (in 000)	Bulgaria	8	0.6	95	10.0	235	17.6	200	14.9	760	56.8	1,299	100
	Croatia	3	0.5	78	13.3	84	14.4	103	17.5	319	54.3	588	100
	Hungary	13	0.8	205	12.5	169	10.2	373	22.7	886	53.8	1,646	100
	Romania	15	0.6	245	10.6	422	18.3	382	16.5	1,245	53.9	2,310	100
	Serbia	7	1.0	89	12.5	143	20.1	110	15.5	364	51.0	713	100
	Slovenia	4	1.0	75	20.3	40	10.8	86	23.0	167	44.8	372	100
Value added (in billion €)	Bulgaria	0.2	1.3	1.7	11.8	1.7	12.0	2.8	20.2	7.7	54.7	14.0	100
	Croatia	0.1	0.7	1.7	14.1	1.2	10.5	2.6	21.8	6.3	53.0	11.9	100
	Hungary	0.3	1.2	4.5	15.4	2.4	8.3	6.4	21.8	15.5	53.3	29.2	100
	Romania	0.3	1.0	3.3	11.7	2.9	10.2	5.3	18.9	16.4	58.2	28.2	100
	Serbia	0.1	1.3	1.2	13.8	1.3	14.4	1.8	20.4	4.5	50.1	8.9	100
	Slovenia	0.2	1.3	3.0	24.0	1.2	9.5	2.8	22.0	5.5	43.2	12.6	100

Source: Authors' own calculation and representation based on the data from Eurostat, the Statistical Office of the Republic of Serbia and DIW Econ.

active either in the knowledge-intensive service industries or in the high-tech manufacturing industries.

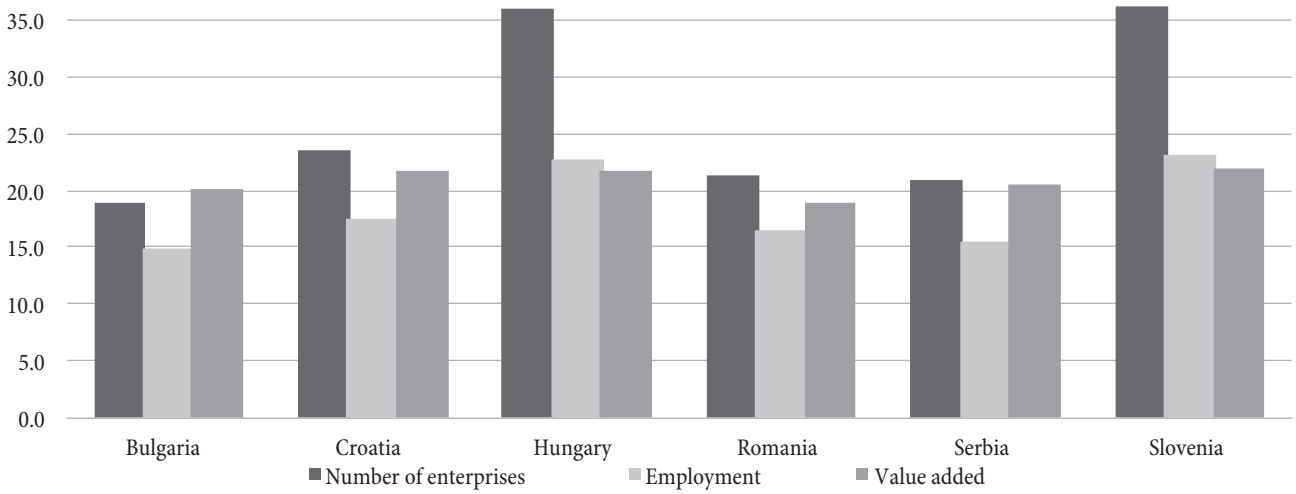
In terms of technology intensities of SMEs, Serbia's position is relatively favorable compared to other EU countries from the region. Although in Hungary there is a larger number of high-tech SMEs in comparison to Serbia, the participation of high-tech industries in Serbia, including manufacturing and services, is higher compared to other EU countries from the region. The situation is similar in terms of employment. Although high-tech SMEs from Romania, Hungary and Bulgaria employ more workers than SMEs from Serbia, the participation of SMEs operating in high-tech industries in total (manufacturing + services) employment of SMEs in Serbia is above all selected EU countries from the region, with the exception of Slovenia behind which it is only slightly lagging. However, when it

Figure 7: Distribution of non-financial business sector SMEs from Serbia and selected EU countries across sectors of high-tech industries in 2017



Source: Authors' own calculation and representation based on the data from Eurostat, the Statistical Office of the Republic of Serbia and DIW Econ.

Figure 8: Distribution of non-financial business sector SMEs from Serbia and selected EU countries across sectors of knowledge-intensive services in 2017



Source: Authors' own calculation and representation based on the data from Eurostat, the Statistical Office of the Republic of Serbia and DIW Econ.

comes to value added, the situation is significantly more unfavorable for Serbia. High-tech SMEs from Serbia generate higher value added only in relation to high-tech SMEs from Croatia. Serbia has a higher share of SMEs operating in high-tech industries in total (manufacturing + services) value added of SMEs compared to SMEs from Croatia, Romania and Hungary, while it significantly lags behind the high-tech SMEs from Slovenia and Bulgaria.

In Serbia, there is a larger number of SMEs from the sectors of knowledge-intensive services in relation to Croatia, Slovenia and Bulgaria (fewer than in Romania and Hungary), but the participation of these knowledge-intensive SMEs in the total (manufacturing + services) number of SMEs in Serbia is lower than in the observed EU countries from the region, except in Bulgaria. The situation is similar in terms of employment, as SMEs from the sector of knowledge-intensive services in Serbia employ more workers than the knowledge-intensive SMEs from Slovenia and Croatia, but the participation of these knowledge-intensive SMEs in the total (manufacturing +services) number is only higher than in Bulgaria. In contrast to the number of enterprises and employment, SMEs from the sectors of knowledge-intensive services from Serbia create the lowest value added in relation to SMEs from the five observed EU countries from the region, although the participation of these knowledge-intensive

SMEs in the total (manufacturing + services) number of SMEs in Serbia is above the one in Romania and Bulgaria.

The previous comparative analysis of the basic indicators of the business of SMEs from Serbia and five selected EU countries from the region indicates that, although in Serbia there is a relatively large number of SMEs in the sectors of high-tech industries and knowledge-intensive services, these SMEs are less important in terms of employment and economically weaker compared to similar companies from the observed EU countries from the region, which further points to a lower level of SME development in Serbia compared to the observed countries.

In the period from 2009 to 2017, the number of SMEs in Serbia significantly increased only in 2016 and 2017, the result of which was that in 2017 there were more than 36 thousand SMEs from the non-financial business sector more than in 2009. Unlike SMEs, the number of large companies was relatively stable over the whole period, although it dropped below the level from 2009. The year of 2017 saw a somewhat significant increase, although this growth was not enough to compensate for the decline at the beginning of the economic crisis.

Employment trends in Serbia within the non-financial business sector in the 2009-2017 period vary considerably in relation to the trends in the number of enterprises and value added. Almost throughout the whole observed period, employment within the non-financial business sector was below the level of 2009, with a greater decline in SMEs compared to large enterprises. The turnover in big companies came about only in 2016 and 2017 when the number of employees exceeded the level of 2009, and in SMEs the number of employees exceeded the level of 2009 only in 2017 – the number of employees in SMEs in 2017 was bigger by 12 thousand compared to 2009, which increase was by three thousand lower than the increase in the number of employees in large enterprises.

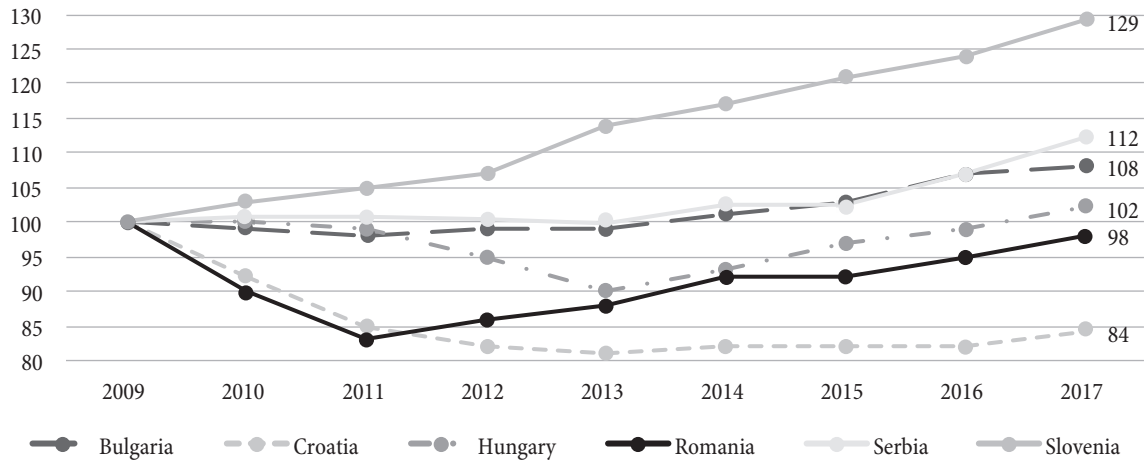
Table 5: Relative development of the number of enterprises, employment and gross value added (in current prices) with regard to size of enterprises in the non-financial business sector in Serbia from 2009 to 2017

		2009	2010	2011	2012	2013	2014	2015	2016	2017
Number of enterprises	SMEs	100	101	101	100	100	103	102	107	112
	Large enterprises	100	**95**	**94**	**95**	**93**	**93**	**93**	**94**	**98**
Employment	SMEs	100	**93**	**91**	**90**	**89**	**88**	**93**	**97**	102
	Large enterprises	100	**94**	**96**	**96**	**95**	**95**	**96**	101	104
Value added	SMEs	100	101	112	109	116	110	106	123	134
	Large enterprises	100	**95**	103	103	102	105	110	119	132

if value ≥ 110 | if 80 < value < 100
if 100 < value < 110 | if value < 80

Source: Authors' own calculation and representation based on the data from Eurostat, the Statistical Office of the Republic of Serbia and DIW Econ.

Figure 9: Trend in the number of SMEs in Serbia and selected EU countries in the non-financial business sector (2009=100)



Source: Authors' own calculation and representation based on the data from Eurostat, the Statistical Office of the Republic of Serbia and DIW Econ.

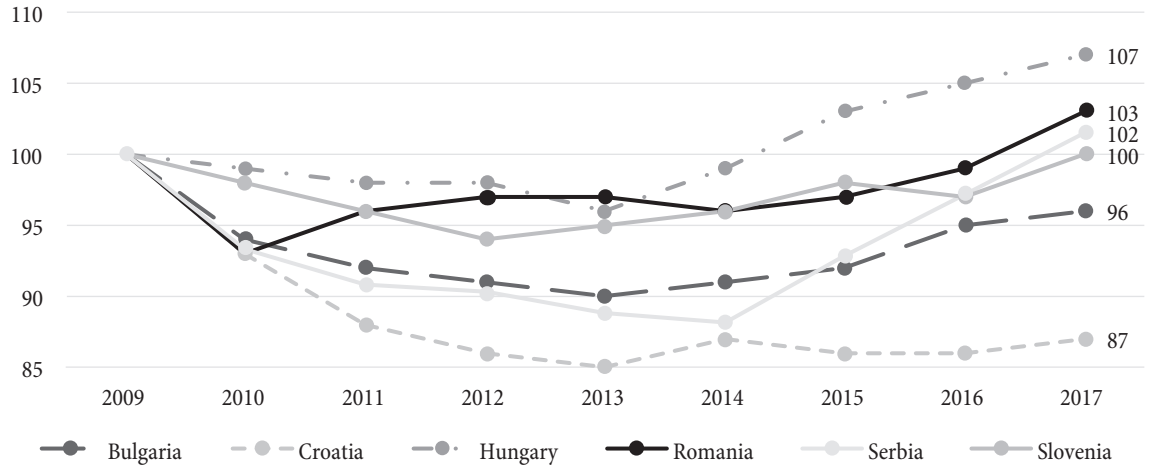
The trend of the value added provides the best opportunities for Serbia, since in the observed period it shows a significant increase in both SMEs and large enterprises, this growth being slightly higher in SMEs. Unlike large companies, which showed a drop in value added in 2010 below the level of 2009, in SMEs value added in all observed years was above the 2009 level.

The number of SMEs in the 2009-2017 period increased the most in Slovenia and Serbia, followed by Bulgaria and Hungary, while it decreased in Romania and Croatia. Regarding the number of SMEs, the most favorable situation is in Slovenia where the growth in the number of SMEs was recorded throughout the period, and the most unfavorable situation is in Croatia, where the number of SMEs was significantly below the 2009 level during the entire observed period.

In the 2009-2017 period, employment in SMEs in Serbia and the observed EU countries from the region first declined and it was not until the end of that period that the majority of countries saw its growth. In 2017, compared to 2009, employment in SMEs in Hungary, Romania and Serbia increased to the level of 2009, while in Bulgaria, and especially in Croatia, there was a significant decline in employment in SMEs.

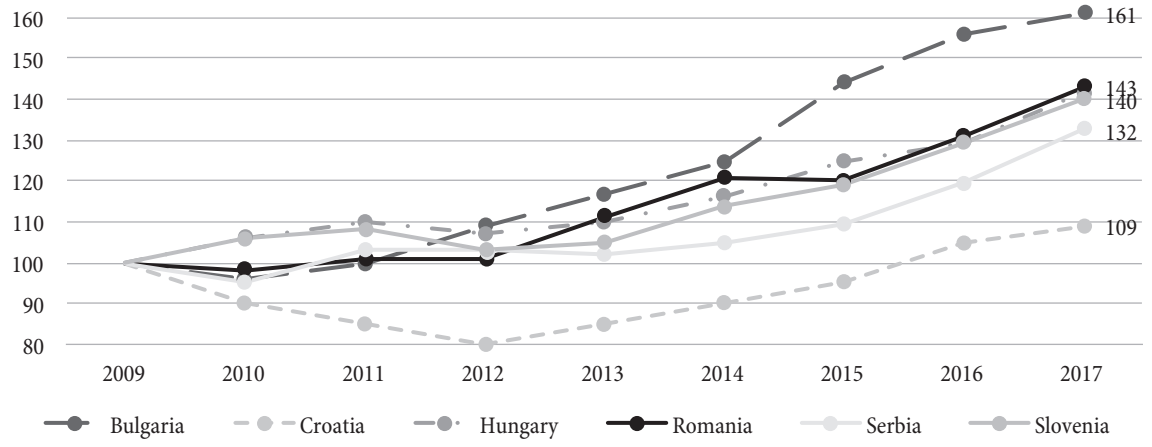
In contrast to the trends in the number of SMEs and employment, in the 2009-2017 period value added grew steadily, with a minor deviation, in all observed countries. In 2017, compared to 2009, value added increased in Bulgaria, Romania, Hungary and Slovenia, to a lesser extent in Serbia, while the most modest increase was achieved by Croatia, which saw the only drop in value added during this period.

Figure 10: Evolution of SME employment in Serbia and selected EU countries in the non-financial business sector (2009=100)



Source: Authors' own calculation and representation based on the data from Eurostat, the Statistical Office of the Republic of Serbia and DIW Econ.

Figure 11: Evolution of SME value added in Serbia and selected EU countries in the non-financial business sector (2009=100)



Source: Authors' own calculation and representation based on the data from Eurostat, the Statistical Office of the Republic of Serbia and DIW Econ.

Taking everything into consideration, different trends in the basic SME performance indicators (number of enterprises, employment and value added) were recorded in the six observed countries (Serbia and EU countries from the region) in the period from 2009 to 2017. Cumulative growth in the number of SMEs, SME employment and SME value added from 2009 to 2017 was realized only by SMEs from Hungary and Serbia. Despite the fact that, during the same period, the number of SMEs in Romania dropped, employment and value added increased. In Bulgaria and Slovenia, the growth in the number of SMEs and value added created by them was accompanied by a decline in employment, which led to a significant production increase in these SMEs. SMEs in Croatia face the most unfavorable situation, because the number of SMEs, employment and value added suffered a decline, which is why structural adjustment resulted in establishing a significantly lower level of development of SMEs in 2017 compared to 2009.

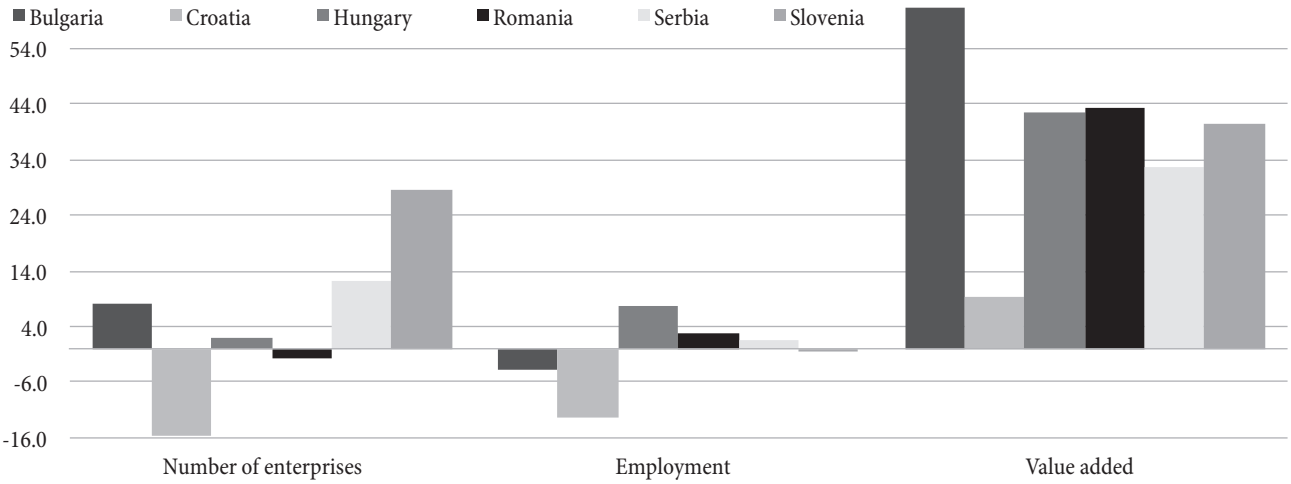
In some of the observed countries, in the 2009-2017 period SMEs in the non-financial business sector recorded better performance in relation to large enterprises (e.g. in Slovenia and Bulgaria), while in other countries large enterprises performed better (e.g. in Hungary and Romania). In Serbia SMEs achieved better results in terms of company growth, but lower growth in terms of employment and value added. In Croatia large companies managed to recover well from the impact of the crisis in 2017 and to get closer to the 2009 level in terms of the number of enterprises and employment, while SMEs managed to create a higher level of value added compared to 2009. Starting from the previously obtained results, we go on to investigate how much SMEs have really contributed to the growth of employment and value added in the non-financial business sector in Serbia and the observed EU countries from the region.

Contribution of SMEs to the evolution – recovery and expansion of or decline in employment and value added in Serbia and selected EU member states from 2009 to 2017

SMEs played their part concerning the growth of value added in the non-financial business sector in Serbia and selected EU countries from 2009 to 2017. They accounted for 55% of the total increase in value added in the non-financial business sector in Serbia. This contribution was greater than the one made by SMEs from Romania (48%) and Hungary (51%) and significantly lower than the contribution of SMEs from Croatia (108% due to the fall in the value added of large companies), Bulgaria (70%) and Slovenia (67%).

The picture of the contribution of SMEs to employment is more complex. In Serbian economy, SMEs accounted for 45% of the total employment growth in the non-financial business sector from 2009 to 2017. Such contribution was more modest only than the contribution of SMEs from Romania (49%) and greater than the contribution of SMEs

Figure 12: Cumulative increase in the number of SMEs, value added of and employment in SMEs from 2009 to 2017 in Serbia and selected EU countries



Source: Authors' own calculation and representation based on data from the Eurostat, Statistical Office of the Republic of Serbia and DIW Econ.

from Hungary (42%). On the other hand, in Bulgaria and Croatia SMEs accounted for 95% and 79% of total employment in the non-financial business sector from 2009 to 2017, respectively.

In order to further analyze the contribution of SMEs to the recovery from recession in Serbia and selected EU countries in 2009, we performed an analysis that compares the proportion of the change in gross value added (and employment) from 2009 to 2017 accounted for by SMEs in the NFBS to the NFBS SME share of the economy-wide gross value added (employment) in 2009.

SMEs in Serbia contributed 65% more than expected to the recovery of value added based on their share of gross value added in 2009, which was greater than the contribution made by SMEs from Romania (-12% less than expected), Hungary (+37% more than expected) and Bulgaria (+60%), and lower than the contributions made by SMEs from Croatia (+92%) and Slovenia (+122%).

A significantly less favorable situation appears concerning the analysis of the contribution of SMEs in the NFBS to recovery of employment across the economy, because only Hungarian and Serbian economies show

Figure 13: Share of the increase/decrease in employment and value added in the non-financial business sector accounted for by SMEs from 2009 to 2017

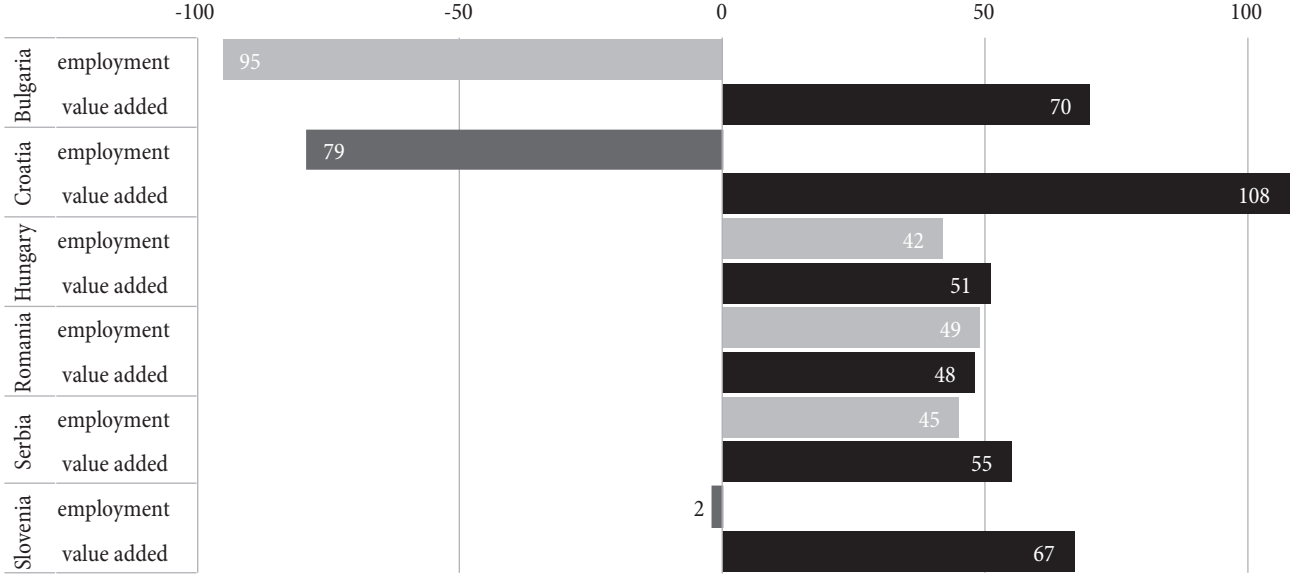
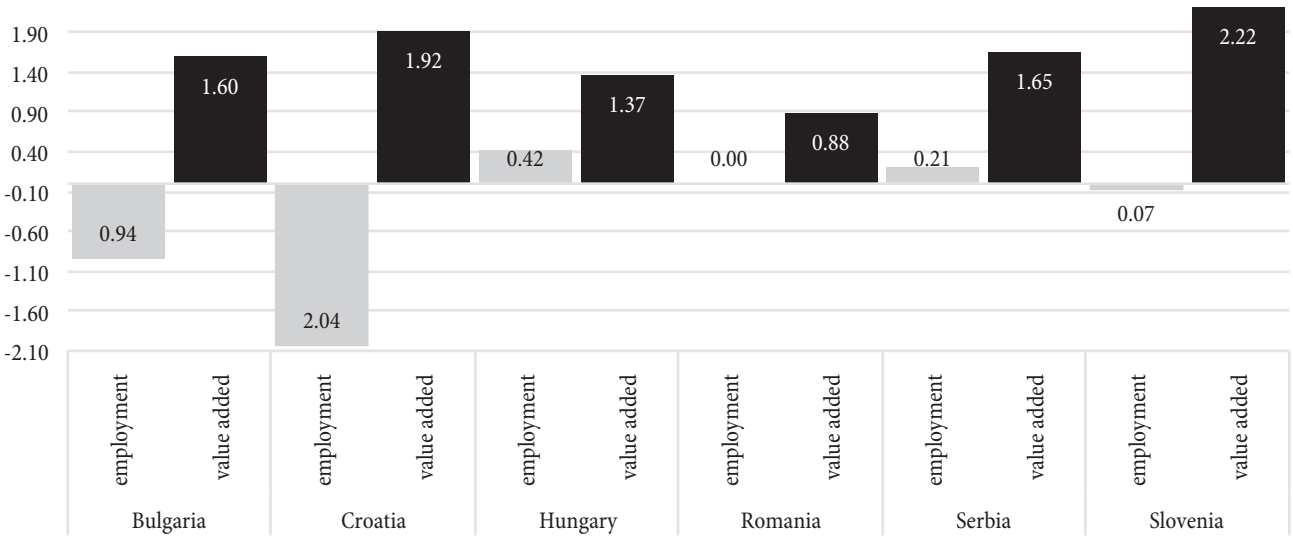


Figure 14: Contribution of SMEs in the NFBS to recovery and subsequent expansion (or decline) in economic-wide gross employment and value added from 2009 to 2017 – value of contribution



Source: Authors' own calculation and representation based on the data from Eurostat, the Statistical Office of the Republic of Serbia and DIW Econ.

Source: Authors' own calculation and representation based on the data from Eurostat, the Statistical Office of the Republic of Serbia and DIW Econ.

an increase in employment in NFBS SMEs and overall economy from 2009 to 2017.

At the level of Serbian economy, SMEs in the NFBS contributed 79% less to the recovery of employment in the overall economy than would have been expected on the basis of their share of employment in the economy in 2009. SMEs from Hungary recorded better results than the ones from Serbia, although they also contributed 58% less than expected. Bulgaria, Croatia and Slovenia showed a decline both in SME employment in the NFBS and in the economy as a whole over the 2009-2017 period. Bulgaria and Slovenia show a smaller SME contribution to the overall decline than would have been expected on the basis of their share of total employment in 2009, while Croatia shows much greater contribution to overall job decline than expected.

Table 6: Contribution of SMEs in the NFBS to the recovery and subsequent expansion (or decline) in economy-wide gross employment and value added from 2009 to 2017 in Serbia and selected EU member states

State	Employment	Value added
Bulgaria	NO*	YES
Croatia	YES*	YES
Hungary	NO	YES
Romania	Not applicable	NO
Serbia	NO	YES
Slovenia	NO*	YES

Notes: 'Not applicable' means that the SME and economy-wide indicators (value or employment) did not move in the same direction over the 2009-2017 period.
*Contribution of SMEs to decline.
Source: Authors' own calculation and representation based on the data from Eurostat, the Statistical Office of the Republic of Serbia and DIW Econ.

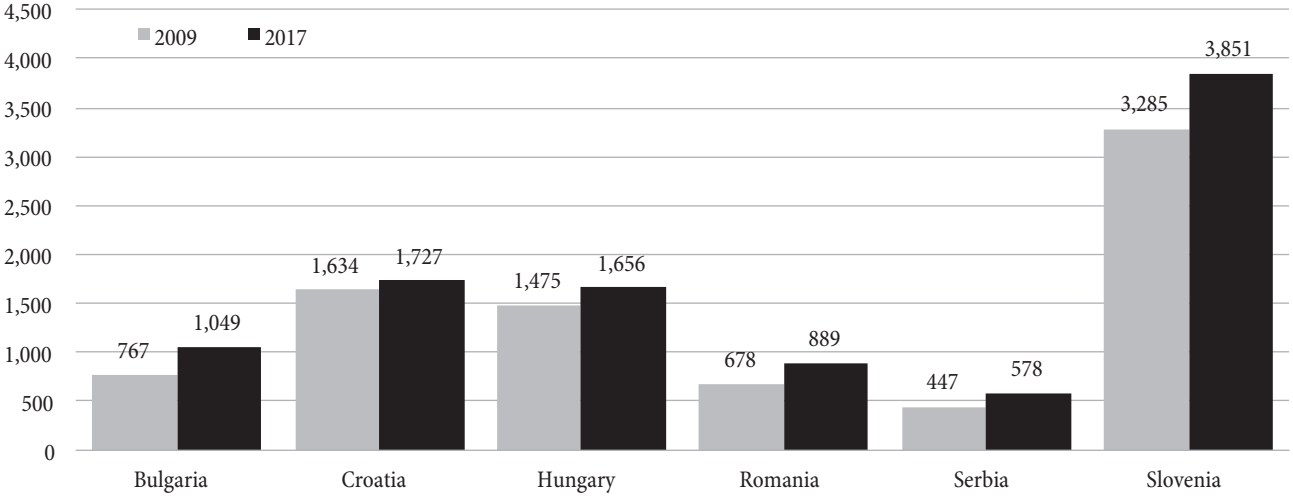
SME development in Serbia and selected EU countries in 2009 and 2017

Compared to 2009, SMEs continued to develop in all observed countries, but with different dynamics. The highest growth in the value of the SME development index was recorded in Slovenia, which not only retained the leading position among the countries observed, but also significantly improved the already high level of development and quality of SME business, which put it in a group of the most developed economies based on their growth in the development of entrepreneurship.

The lowest growth in the value of the SME development index compared to the observed countries was recorded in Croatia. Although according to the values of the SME development index in 2017, Croatia maintained the second position it had occupied in 2009, the slower growth in the value of the index, i.e., in the development of SMEs compared to the other countries observed, led to a decrease in the difference between the development of SMEs in Croatia and other observed countries, that is, the increase in the number of SMEs lagging behind in Croatia in relation to Slovenia.

Although Serbia recorded a higher growth in the value of the SME development index compared to Croatia in the 2017-2019 period, it was lower than in all other countries observed, indicating slow development of SMEs in Serbia and further increasing the gap in the development of SMEs in Serbia compared to other EU countries from the region (except Croatia).

Figure 15: SME development index in selected countries in 2009 and 2017, per capita



Source: Authors' own calculation and representation based on the data from Eurostat, the Statistical Office of the Republic of Serbia and DIW Econ.

Discussion of results and conclusion

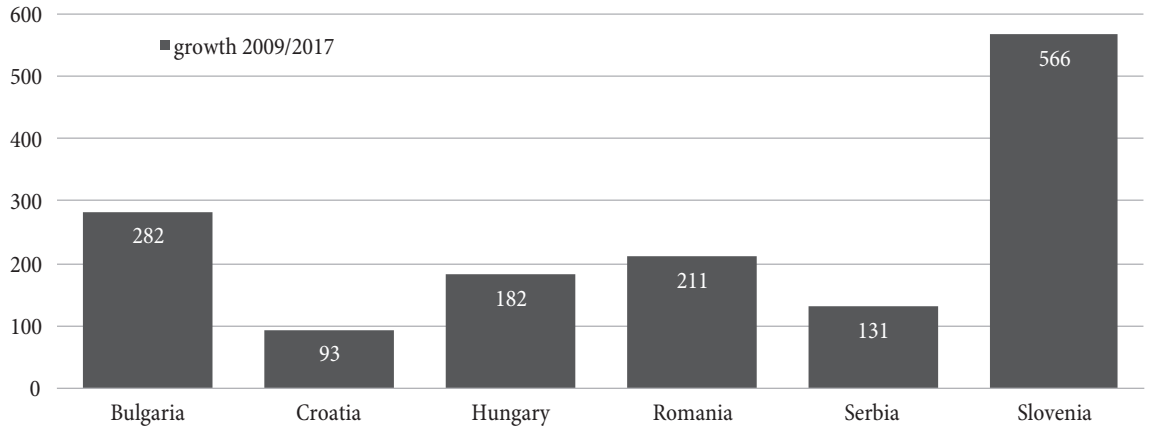
Based on the analysis of the Global Entrepreneurship Index for 2018, the results of the research on the development of entrepreneurship in Serbia and selected EU countries unambiguously indicate that Serbia is lagging behind the selected EU countries from the region, although there are some areas, such as Entrepreneurial Attitudes, where Serbia made significant progress. This assessment coincides with the assessment of the experts from the Global Entrepreneurship and Development Institute who find that "some countries, including Serbia, should have higher levels of entrepreneurship, as implied by their development trend lines, and more efficient use of entrepreneurial resources" [3, p. 36], as well as with the assessment of domestic experts that "in Serbia the wave of recession has stopped the growth of entrepreneurship sector and positive trends in transitional recovery" [15, p. 100].

The previous assessment of the development of entrepreneurship in Serbia is fully compatible with the results of the analysis of the development of SMEs in Serbia and selected EU countries from 2009 to 2017. The results of comparative analysis concerning the performance of SMEs in the non-financial business sector in Serbia and selected EU countries from 2009 to 2017 show that there is a relatively large number of SMEs in Serbia that employ a significant number of workers and create a significant amount of value added. However, the performance indicators of the company's business activity indicate that SMEs from Serbia have lower performance than SMEs from most of the observed EU countries from the region, especially in relation to those from Slovenia, Hungary and Croatia. An even more unfavorable situation is encountered when it comes to technology/knowledge intensities of domestic SMEs in relation to SMEs from selected countries in the region. Domestic SMEs from high-tech industries and knowledge-intensive services are less important in terms of employment and economically weaker in relation to similar companies from the observed EU countries from the region, which further points to a lower level of SME development in Serbia compared to the observed countries.

Also, the results of the SME evolution analysis in the 2009-2017 period, in terms of the number of enterprises, employment and value added in the non-financial business sector, as well as the contribution of SMEs to expansion of or decline in employment and value added, in Serbia and selected EU member states, although not always unambiguous, show a lower contribution of domestic SMEs to the recovery and expansion of the economy from 2009 to 2017 in terms of employment and value added in relation to most of the observed EU countries from the region. They also show disproportionate results relative to their importance in the economy, especially in terms of employment.

However, in order to obtain completely clear results regarding the level and trend of development of SMEs in Serbian economy and selected EU countries, a complex indicator of the development of SMEs, called SME development index, was constructed, integrating

Figure 16: The change in the value of the SME development index per capita in the 2009-2017 period



Source: Authors' own calculation and representation based on the data from Eurostat, the Statistical Office of the Republic of Serbia and DIW Econ.

important factors of development and importance of SMEs in the observed economies. The obtained values of the SME development indicators show that SMEs from Serbia are less developed and develop more slowly compared to all other EU countries from the region (except Croatia), which points not only to the slow development of SMEs in Serbia, but also to further widening of the gap between the development of SMEs in Serbia and other EU countries from the region (except Croatia). Based on the previous results, the general conclusion is that, in the 2009-2017 period, SMEs contributed to the recovery of the domestic economy, but that contribution was lower than it would have been expected on the basis of the relative importance that SMEs have in the domestic economy and the contribution of SMEs in the majority of EU countries from the region.

Lower degree of development and slower growth of SMEs in Serbia in relation to the EU member states from the region are the result of a simultaneous impact of a number of factors. The speed and quality of SME development in Serbia depends to a large extent on general business conditions and the quality of business environment (e.g. the EC study states that "the business environment in Serbia is still hampered by a number of challenges, including the costly, unpredictable and non-transparent system of parafiscal charges; red tape; and difficult access to finance, especially for SMEs" [9]), the development of entrepreneurial infrastructure and culture and, in particular, the efficiency of the system of financial and non-financial incentives for the development of new, innovative companies. According to the factors that affect the speed and quality of SME development, the obtained results unambiguously show low efficiency of the existing SME development policy and the economy of Serbia as a whole. Therefore, the question is raised regarding justification of the continuation of implementation of the existing economic development policy and, within it, the SME development policy based on the Strategy of Supporting the Development of Small and Medium enterprises, Entrepreneurship and Competitiveness for the Period from 2015 to 2020. The slow pace of the development of entrepreneurship and SMEs in Serbia points to the need for a significant redefinition of the existing and/or adoption of a new SME development strategy and policy in order to accelerate the dynamics and increase the quality of SME sector development in Serbia, thus reducing the lagging of SMEs and the overall economy behind EU countries in general. The aim of such redefinition/adoption is to enable taking into consideration the recommendation of OECD experts, which indicates that "government action should focus on improving the general operational environment and introduce targeted measures mainly to address coordination and market failures" [19, p. 18]. In case of Serbia, this would include implementation of the following individual activities in the upcoming period:

- Increase awareness of SMEs of the programs available for export promotion,
- Design supplier development programs,
- Conduct strong and comprehensive monitoring and evaluation using specific measures and key performance indicators to conduct long-term impact assessments of programs,
- Develop programs that promote e-commerce [20, pp. 871-872],
- Develop incentive mechanisms for growth and development of dynamic entrepreneurship [14, p. 112],
- Change the existing method of financing of the entrepreneurial sector and focus on financing aligned with various stages in the development of enterprises,
- Develop institutions for non-financial support to the development of entrepreneurship and change the structure of services offered in the direction of advisory assistance in the field of growth and development of enterprises [12, p. 220].

Implementation of these measures, along with those previously initiated and still not fully implemented, can contribute to a stronger development of entrepreneurship and SMEs in Serbia in the medium and long term, which will, on the other hand, have a very positive effect on the overall economy and contribute to higher employment and standard of living for the majority of people in Serbia.

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Miroljub Nikolić

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CORPORATE ENTREPRENEURSHIP, ENVIRONMENT DYNAMISM AND FIRM PERFORMANCE: EVIDENCE FROM SERBIA*

Korporativno preduzetništvo, dinamičnost okruženja i performanse preduzeća – slučaj Srbije

Abstract

Findings and knowledge about the relationship between corporate entrepreneurship and firm performance are not yet integrated and cumulative. While some authors support the ongoing entrepreneurial activities of established enterprises, others highlight its negative impact on their performance. Consequently, the question posed is that of significance of innovations' appropriate extent and adequate measurement. The focus of the present research is investigation of the nature of the relationship between corporate entrepreneurship and firm performance, as well as identification of factors with significant impact on the said relationship. By using data on 136 medium-sized and large enterprises operating in Serbia, this study shows that it is not always justified to increase the level of corporate entrepreneurship, i.e., that there is an optimal level of entrepreneurial activities. Moreover, the identified optimal level of corporate entrepreneurship is determined by the dynamism of the environment in which a firm operates. A high level of corporate entrepreneurship is desirable for dynamic environments, whereas in static environments the best performance is achieved at the medium (moderate) corporate entrepreneurship level.

Keywords: *corporate entrepreneurship, firm performance, environment dynamism, Serbia.*

Sažetak

Saznanja o vezi između korporativnog preduzetništva i performansi preduzeća još uvek nisu integrisana i kumulativna. Dok jedni autori podržavaju kontinuirano sprovođenje preduzetničkih aktivnosti etabliranih preduzeća, drugi ističu njegov negativni doprinos performansama. Posledično, nameće se pitanje važnosti doziranja i adekvatnog upravljanja inovativnim aktivnostima pojedinih privrednih subjekata. Centralna tema ovog istraživanja je ispitivanje prirode veze korporativnog preduzetništva i performansi preduzeća, ali i identifikovanje faktora koji bitno utiču na tu vezu. Koristeći podatke o 136 srednjih i velikih preduzeća koja posluju u Srbiji, u radu je pokazano da nije uvek opravdano povećavati nivo korporativnog preduzetništva, odnosno da postoji optimalni nivo preduzetničkih aktivnosti. Dodatno, identifikovani optimalni nivo korporativnog preduzetništva determinisan je stepenom dinamičnosti okruženja u kome preduzeće posluje. Dok je za dinamično okruženje poželjan visok nivo, najbolje performanse u statičnom okruženju ostvaruju se na srednjem (umerenom) nivou korporativnog preduzetništva.

Ključne reči: *korporativno preduzetništvo, performanse preduzeća, dinamičnost okruženja, Srbija.*

* This paper is a part of the author's PhD dissertation *"Investigation of the nature and determinants of the relationship between the corporate entrepreneurship and performance of the medium-sized and large companies in Serbia"* and its publishing is an integral part of the dissertation process at the University of Belgrade.

Introduction

In the era of the Fourth Industrial Revolution and an increasing significance of disruptive technologies, innovation and entrepreneurship are critical factors of corporate survival. Such a turn toward innovation-based economy promotes knowhow, data analysis and the internet as central concepts, while the market is being shifted to the field of new competitiveness. While competitive advantage of established companies used to be based on their size and experience and focused on competition with peers, nowadays innovation of small firms, relying on disruptive technologies, may disrupt large and rigid systems. In such a context, in order to survive in the market, the already established companies employ various strategies to initiate innovative entrepreneurial activities within their businesses. Corporate entrepreneurship is a term used to explain the entrepreneurial efforts of established medium-sized and large enterprises. In the early 1970s, several researchers discovered the significance of entrepreneurship and its role in the restoration of the existing companies. Due to its remedial effects on the revitalization of firms and increased performance, corporate entrepreneurship then became a focus of interest for a number of researchers. Interest in corporate entrepreneurship development is present among authors today, as well, as a result of the need to introduce new managerial tools that ought to enable competitiveness in environments subject to constant change. The continuing substantial concern with the contribution of entrepreneurial activities to firm performance is well illustrated by the fact that different views on this matter expressed in the past have remained unreconciled and far from unified. Numerous authors, who used to be uncompromising with regard to the contribution of the corporate entrepreneurship to the viability of firms and business, now state that corporate entrepreneurship is merely a short-term factor and not a strategic one. The subsequently conducted studies highlight the positive effects and contribution of corporate entrepreneurship and support the ongoing instigation of such activities within companies. There are also empirical analyses that illustrate adverse effects of corporate entrepreneurship on performance. Despite the required higher innovation levels within the context of the Fourth Industrial Revolution, based on the aforesaid opposing results of the previous studies, and in order to shed more light on the said relationship for corporate managers, it is important to determine whether there is an optimal level of entrepreneurship within firms, and if so, what determines such an optimal level. To resolve this dilemma, we have conducted an empirical research on a sample of medium-sized and large enterprises operating in Serbia.

The present paper is structured as follows: after the introductory considerations, we present a detailed review of literature, which provided a basis for defining the research hypotheses; the second section describes the research method including sampling, measures, and data collection; thereafter, we test our hypotheses; and finally, we detail and discuss the results.

Literature review and hypotheses development

Corporate entrepreneurship

The corporate entrepreneurship concept has been a subject of scientific research and practitioners' interest for over four decades. Although they did not use the term corporate entrepreneurship to describe entrepreneurial behavior of the already established companies, Peterson and Berger were among the first authors who examined the manner of introducing entrepreneurship into medium-sized and large companies [32]. However, the definition of the construct of corporate entrepreneurship is associated with the works of Burgleman in the early 1980s. This author says that corporate entrepreneurship refers to the process of a company's diversification through its internal development. Such diversification requires a completely new combination of resources to help the firm extend its activities into new spheres of business that are marginally related or fully unrelated to its current area of business activity [9, p. 1349]. Vesper views corporate entrepreneurship as bottom-up innovation, coming from an individual within a large organization, which needs not be known to or expected by this individual's manager [45, p. 295]. Gifford Pinchot is another scholar that has made a significant contribution to this field, having explained the difference between an

independent entrepreneur and an entrepreneur within a large corporation, i.e., intrapreneur [33, p. ix]. Sharma and Chrisman explain corporate entrepreneurship as a process whereby an individual or a group of individuals, in association with an existing organization, create a new organization, or instigate renewal or innovation within that organization [39, p. 18]. Jennings and Lumpkin define corporate entrepreneurship as the extent to which new products or new markets are developed, and an organization as entrepreneurial if it develops a higher than average number of new products and/or new markets [21, p. 489]. Schendel provides a somewhat different understanding of corporate entrepreneurship. This author holds that corporate entrepreneurship should be seen not only as creation of new products and processes, but also as transformation of the company itself. Schendel links the concept to the creation of new businesses within the existing companies and their strategic transformation [40, p. 2]. This is reaffirmed by Sathe, who defines corporate entrepreneurship as a simple process of organizational self-renewal [36], [17, p. 2]. In 1990, Guth and Ginsberg provided a potentially reconciling view on corporate entrepreneurship, closest to the one used nowadays. These two authors identify two forms of corporate entrepreneurship, one exclusively relating to the birth of new business within existing organizations by developing new products and/or processes, and the other relating to strategic transformation of organizations through renewal of the key ideas upon which they are built [19, p. 5]. A step further in defining corporate entrepreneurship was made by Zahra, for whom corporate entrepreneurship is a combination of innovation and entrepreneurial efforts to enter new businesses, as well as to revitalize the company's operations, whereby each of the three components have special significance [50, p. 1715]. The aforesaid components are known in the literature as corporate entrepreneurship dimensions and are designated as innovation, corporate venturing and strategic renewal. Although there are studies that deal with specific corporate entrepreneurship dimensions separately, the view prevailing in the literature is that upon determining the corporate entrepreneurship level, it is necessary to consider all of the three dimensions simultaneously [34], [39], [41], in order to eliminate possible deficiencies of using those dimensions in isolation, such as ignoring their complementarity [41, p. 83] or neglecting the effects of their interaction [39, p. 20]. Understanding, as well as measuring corporate entrepreneurship in the present paper relies on the views of the aforesaid authors.

Corporate entrepreneurship and performance

Most of the research into the relationship between corporate entrepreneurship and firm performance emphasizes a positive contribution of entrepreneurial activities to the performance. This particularly refers to the period of early investigation of the said relationship. For instance, although not yet completely defining the concept of corporate entrepreneurship, in 1986, Zahra revealed that a focus on entrepreneurial activities has positive and significant effects on the achieved net sales revenues [12, p. 19]. Subsequent to his definition of corporate entrepreneurship dimensions, a few years later, this author once again tested and confirmed the contribution of corporate entrepreneurship to profitability of companies by assessing its impact on the accounting and financial performance indicators [48]. Covin and Slevin also assumed that there is a positive correlation between entrepreneurial approach to business operations and performance [12]. In addition to the correlation between corporate entrepreneurship and profitability, these researchers emphasize the significance of entrepreneurship for company growth. There were studies that, focusing on the contribution of entrepreneurial activities to performance, analyze such effects in the international operations of companies. Use of innovation and entrepreneurial activities as a source of competitive advantage is directly correlated with sales growth, both in domestic and foreign markets. According to Bloodgood [7, p. 61], this positive effect will also affect the overall firm performance. Significance of corporate entrepreneurship within global corporate foreign operations was confirmed by Gavris and Zahra [51], as well. Numerous subsequent studies have only reaffirmed the evident contribution of corporate entrepreneurship to performance, and justified the ongoing initiation of entrepreneurial activities within companies [35], [41], [52], emphasizing its positive correlations with profitability [3], [49], [51], [53], innovation [27] and

growth [12], [26]. They often underlined the contribution of corporate entrepreneurship to competitive advantage of companies, as well [10].

Somewhat later, Andersen provided a critical review of the long-established positive correlation between the observed variables and highlighted a number of factors that were neglected within it, which could substantially affect the direction of the relationship [2]. At the same time, instances of negative effects of corporate entrepreneurship on performance appeared both in theory and in practice [1], [18], [23], [37]. Lekmat and Selvarajah claim that not all of the corporate entrepreneurship dimensions have positive effects on the firm performance. In their research, these authors conclude that innovation, as well as strategic renewal, may lead to considerable improvement in operations of a company, but at the same time, corporate venturing may have powerful adverse effects on profitability [37, p. 117]. Interestingly, other scholars obtained similar results for the remaining two corporate entrepreneurship dimensions. Samsudin finds that innovation and strategic renewal do result in negative financial performance [37, p. 127]. Similarly, in 2011, Su, Xie and Lishowed that in young companies, the positive effects of increasing entrepreneurial activities on their performance decline [42, p. 558]. In addition, numerous examples from corporate practice suggest contradictory conclusions regarding the role of corporate entrepreneurship. For instance, a pharmaceutical company Eli Lilly and Google Ventures (CVC) confirmed the significance of entrepreneurial activities and their ongoing initiation and promotion. Contrary to this, the case of Enron shows how the negative impact of the high-volume corporate entrepreneurship utterly ruined some of the most successful companies [6].

Although a great many studies suggested and documented the existence of either a purely positive or a purely negative linear relationship between corporate relationship and firm performance, Tang underlines that not one of them specified whether such positive or negative correlation is indefinite [43, p. 219]. While on one hand the results obtained indicate that ongoing innovation within companies is a necessity, there are significant adverse consequences of excessive corporate entrepreneurship on the other hand. Based on the aforesaid contradictory findings, it is justified to assume that an optimal level of entrepreneurial activities does exist in established enterprises.

In support of the foregoing, results of numerous empirical studies indicate in various manners that there is an optimal level of entrepreneurial activities [43], [46]. According to Wales [46, p. 96], for better recognition of the nature of the link between corporate entrepreneurship and firm performance, it is useful to monitor continuously the difference between the marginal benefits and marginal costs associated with the increase in the company's increased entrepreneurial activities. The aggregate effect on the performance will depend on the relationship between the marginal benefits and marginal costs arising from performing entrepreneurial activities. If the potential costs incurred due to decrease in available resources exceed the potential benefits from the use of those resources, the company will face a decline in the overall performance. According to Wales, a middle (moderate) level of entrepreneurial activity will lead to a maximal performance, while both extremely low and extremely high levels of entrepreneurial behavior will disrupt the company's performance. Wales explains the adverse effect of high entrepreneurship levels on the performance as a consequence of the need to withdraw resources from the basic business activities and to deploy them in implementation of new, innovative activities.

Speaking about the risk-return paradox, Bowman explains that positive financial returns are achieved when an organization conducts risky activities at a certain optimal level [8]. If the aforesaid risky activities are understood as the activities belonging to the context of corporate entrepreneurship, this is another confirmation that there is an optimum. Davis, Morris and Allen suggest the same conclusion. They ask whether there is a so-called "entrepreneurial trap", i.e., whether corporate entrepreneurship activities are always desirable and, if not, at what point they need to be discontinued so as not to result in chaos and loss of control [13, p. 43]. Ten years later, three scholars from the most eminent universities in the world underlined the existence of the optimal level of the entrepreneurial structure within the context of the balance between rigid and flexible. They explained that the worst performance is connected with high

flexibility (flexible structure), as well as with extensively high efficiency (rigid structure). The best performance is achieved at the level of moderate organizational structure [14, p. 427]. Given the fact that a rigid structure is related to inhibition of innovation and that more freedom and flexibility encourage entrepreneurial behavior, based on these authors' results, there is an analogy with the aforesaid optimal level of corporate entrepreneurship.

Based on all of the foregoing, it may be assumed that the relationship between corporate entrepreneurship and performance is not simple and linear, and that companies need to strive for a certain optimal level of entrepreneurial activities in order to achieve superior financial performance. With regard thereto, there is a need to conduct additional investigation into the nature of the relationship between the observed variables. This is confirmed by Wales, who stated that a possibly adverse impact of entrepreneurial activities on performance has not yet been sufficiently investigated in the literature, and invited researches to do in-depth analyses of this relationship [46, p. 114]. Other scholars have also joined this invitation for additional examination of the relationship between corporate entrepreneurship and performance, as they hold that a better understanding of its nature would make an important contribution to the theory, as well as a practical insight into the manner of managing such a strategic renewal effectively and efficiently in companies operating in diverse environments [5, p. 70]. Taking into account that evidence on the nature of this relationship is not complete and definite, in this paper we define the following hypothesis. *H1: The relationship between corporate entrepreneurship and firm performance is not linear, i.e., there is an optimal level of corporate entrepreneurship.*

Corporate entrepreneurship, firm performance and environment dynamism

Ignoring the context within which an enterprise operates stands out as a major restriction to a closer and more detailed definition of the nature of the relationship between corporate entrepreneurship and firm performance. According to a number of authors, environment dynamism is a crucial element of a more in-depth analysis of the nature of the issue at hand. Based on an extensive review of the available literature in this field, it may be concluded that a predominant view is that a company will have more benefits from conducting entrepreneurial activities if operating in a highly dynamic environment [20], [31]. In other words, environment dynamism has a moderating role in defining the relationship between corporate entrepreneurship and firm performance in terms that a higher environment dynamism intensifies the already established relationship between the two elements [31], [44], [49], [53].

The more dynamically the environment grows, the more useful it becomes for the company to behave in a more flexible manner and with increased innovation, i.e., to increase the level of corporate entrepreneurship. On the other hand, in predictable and stable environments, there is little need for entrepreneurial activities. In certain studies, it is emphasized that, compared to firms in stable environments, firms in turbulent environments will much rather endeavor to be innovative, proactive and less risk-averse in order to achieve superior results [13, p. 49], [29, p. 146]. Miller reaffirms the hypothesis that, in comparison to inferior firms, the more successful ones are characterized by a much higher correlation between the increase in environment dynamism and increase in innovation [28, p. 225]. Explaining the entrepreneurial trap, Davis [13, p. 49] says that it exists due to the turbulence in the environment the companies operate in.

Covin and Slevin also explain that managing the level of entrepreneurial behavior in a dynamic environment plays an important role in achieving superior performance. On a sample of 161 companies, these researchers showed that in dynamic environments, firm performance is positively correlated with entrepreneurship. On the other hand, in a stable environment, high performance was related not to innovation but to the entity characteristics that had inhibiting effects on innovation, such as conservative strategic approaches and mechanistic organizational structure [11, p. 75]. This was reaffirmed by Miller and Freisen [28, p. 227], who remark that the relationship between entrepreneurial activities and firm performance may be less positive or even negative in case of a "benign" environment, i.e., an environment that does not pose a source of uncertainty for a company.

Otache and Mahmood set a new research framework for the relationship between corporate entrepreneurship and firm performance, where environment dynamism has both direct and indirect moderating roles. The indirect moderating role is achieved through organizational elements, because changes in the environment often stimulate the management and employees to think and act in an entrepreneurial manner [31, p. 529]. Some authors see environment dynamism as the cause of high corporate innovation [25, p. 47], since entrepreneurial activities emerge as a response to the changes in the environment faced by the company. Khandwalla shares this view, stating that organizations actually fight the challenges posed before them in highly dynamic environments by means of their entrepreneurial attitudes based on proactive behavior and willingness to assume risks [12, p. 11].

The research conducted by Ting and Wang also suggests that innovation is particularly necessary in industries where huge technological changes occur. Assessing that the high-technology industries are the most powerful means for strengthening national competitive advantage, these authors hold that innovation within companies in those areas not only boosts their performance, but produces significant effects on the performance of the entire economy of a nation [44, p. 517]. Similarly, besides the institutional support, an important factor of success of innovation-based strategies for Li [24, p. 1125] is the ability of a company to assess well the characteristics of the environment it operates in. A turbulent environment with ongoing technological changes compels companies to erase their old routines and triggers adoption of innovation strategies and new business creation, which will certainly improve their current market position. According to the research results, only companies that successfully respond to the challenges of such an environment will survive in the long run. The key instrument to their survival is corporate entrepreneurship activity.

Based on the above-presented empirical studies, it may be concluded that if a company faces particularly rapid and unpredictable changes, volatile market and intense competition, it will be in greater need of innovation. In such a situation, survival is often dependent on the ability of the company to adapt to the changes in an innovative manner. In contrast, if a company operates in relatively stable conditions, in an environment with no changes or with easily predictable ones, entrepreneurial activities are less required. In other words, corporate entrepreneurship activities have a more significant role in dynamic than in static environments. All this is indicative of the fact that a dilemma about the role of environment dynamism in definition of the corporate entrepreneurship optimal level is justified. That is to say that, in addition to investigating whether an optimal level of corporate entrepreneurship exists, it is also necessary to examine what level that is or, more precisely, whether the moderate level thereof always leads to the best performance, as some authors claim in their papers [4], [43], or the optimal level depends on the context a company operates in.

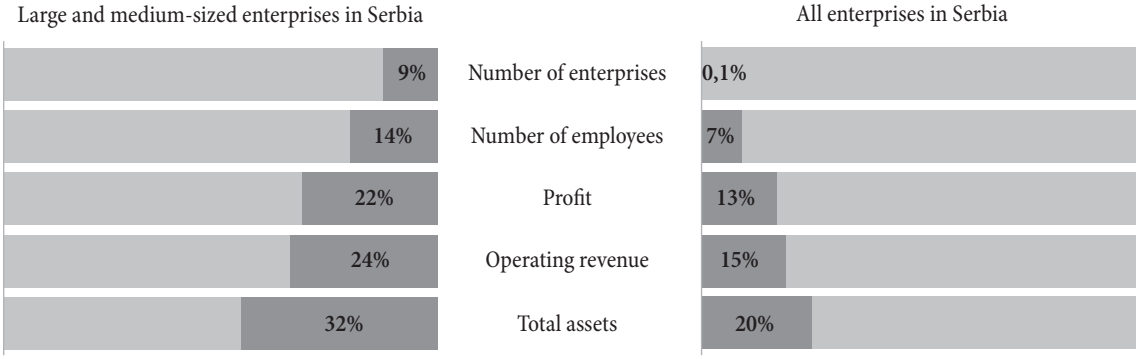
Considering all of the foregoing, it is justified to assume that the optimal level of corporate entrepreneurship, i.e., the level thereof leading to the best performance, is not identical for companies in different environments, but rather depends on the environment dynamism. With regard thereto, we define the following hypothesis. *H2: The optimal level of corporate entrepreneurship for companies operating in static environments differs from that for the companies operating in dynamic environments. The optimal level of corporate entrepreneurship is higher in dynamic environments.*

Methodology

Sample

The sample providing the basis for this research comprises 136 medium-sized and large enterprises operating in Serbia. Based on the data illustrated in Figure 1, it is evident that the share of the sampled companies in the total assets of all business companies in Serbia was 20%, while their share in the total operating revenues and profits generated by all the companies in Serbia was around 15%. The sample is even more significant in light of the comparative analysis of KPIs of all the medium-sized and large companies in Serbia (the population) and the medium-sized and large companies within the sample. The sampled medium-sized and large companies account for almost a third of the total assets of the population observed, while their shares in

Figure 1: Comparative overview of the selected performance indicators of the sampled enterprises and (a) the entire economy in Serbia – right and (b) population of all large and medium-sized enterprises in Serbia – left



Source: Author's calculation based on the Financial Statements Annual Bulletin.

the total operating revenues and profits of the population both equal over 20%. The sampled firms make up about 9% of the entire population. Based on the aforesaid, the sample may be considered to be of an optimal size.

Variables, measures and data collection

Corporate entrepreneurship: for measuring the corporate entrepreneurship level, we used the original instrument developed in 1993 by Zahra [49, p. 338]. The level of corporate entrepreneurship is obtained by evaluating the stages of its three basic dimensions: innovation, corporate venturing and strategic renewal. The said three dimensions were evaluated by means of six factors: new business creation, new product introduction, technological entrepreneurship, mission reformulation, reorganization and system-wide change. The stage of each of the factors was determined based on 28 questions to which the examinees responded to evaluate the level of corporate entrepreneurial activities by using a 5-point Likert scale[1].

The first three factors were used to evaluate the innovation and corporate venturing dimensions. The stage of the first factor, new business creation, was established based on five questions examining the extent to which a company: stimulates demand for current products in the current market through aggressive marketing policies; broadens its business lines within the industry it operates in; executes new business deals in completely new industries related to its current business area; finds new and undiscovered market niches for its products in the current market; and enters completely new business deals offering new products and/or services. The following factor, new product introduction, was assessed as an extent to which a company is focused on the development of new products. The new product introduction was further examined based on the rate of introducing new products into the market; amount of money spent on the new product development activities; number of new products the company introduced into the market, as well as the number of new products the company added to its mix, which were developed by its competitors. The third factor, technological entrepreneurship, was evaluated based on the significance the enterprise assigned to the investments made in new technology development; and their focus on their own independent development of new technologies, as well as adaptation of the new technological solutions created by other firms or industries. In addition, technological entrepreneurship was assessed based on the significance the company assigns to the technological innovation in general, and to the pioneer technological discoveries in the industry it operates in.

The third corporate entrepreneurship dimension, strategic renewal, was evaluated by using the remaining three factors – mission reformulation, reorganization and system-wide change. The mission reformulation factor was assessed based on three questions asked to determine to what extent an enterprise focuses on the definition of its business mission, change of the business concept and redefinition of the industry it operates in.

1 1 – very low value of the observed element; 2 – low value of the observed element; 3 – medium value of the observed element; 4 – high value of the observed element; 5 – very high value of the observed element.

Four questions were used to assess the reorganization factor. Those questions examine the extent to which a company implements organizational and structural changes in order to encourage innovation. This refers to the extent in which the company reorganizes its business units and divisions, ensures coordination among them, defines their autonomy in the creative work processes and creates a flexible organizational structure in order to intensify innovation. The stage of the final, sixth factor, system-wide change, was determined by means of six questions asked to evaluate the extent to which the company organizes staff trainings in employment of various creative techniques, develops procedures for finding and implementing innovative solutions proposed by employees, rewards and internally promotes the staff for their creativity and innovation, and as well as to what extent the company allocates financial and other resources to the implementation of innovation.

The questionnaire was answered by top managers or chief executives of the firms sampled. The response rate was 14.7%, and 136 enterprises were used in the analysis. In order to examine the reliability of the instrument, the Cronbach's alpha coefficient was computed. The reliability analysis showed the value of Cronbach's alpha for the six factors as equal to 0.755; 0.870; 0.870; 0.802; 0.879; and 0.900, respectively. Given that the acceptable value of Cronbach's alpha coefficient is a value above 0.7, sometimes even above 0.6 [30, p. 252], it was concluded that the use of the original questionnaire in computation of the corporate entrepreneurship of the sampled enterprises was justified and plausible. The results of the performed reliability analysis are provided in Appendix 1. Following the reliability analysis resulting in the precise number of each of the factor components, i.e., after it was confirmed that all the questions in the questionnaire used to obtain the factor value were relevant for further analyses, we computed scores for each individual factor. The scores for each of the six factors were obtained as the average of the questions pertaining to the particular factor. Given the fact that these six factors define the abovesaid three dimensions of corporate entrepreneurship, and that the three dimensions in turn define the overall corporate entrepreneurship level, we calculated the corporate entrepreneurship level for each enterprise sampled as the average value of the six factors.

Performance: for measuring the overall performance, we used the return on assets (ROA) obtained as the ratio of the net profit from continuing operations and the total operating assets. Current performance was calculated as the average of ROA values for the past three years. The reason for opting for the said three-year ROA average was to neutralize a potential volatility of the observed indicator over the period, i.e., to mitigate potential extreme ROA values from non-representative years and obtain a more stable performance indicator for the period. The data required for ROA calculation were taken from the publicly available financial statements of the sampled companies.

Environment dynamism: by analogy to the works of Dess and Beard [15], Ensley, Pearce and Hmieleski [16] and Sharfman and Dean [38], dynamism of each separate industry was calculated based on the market and technology instability indices for each industry. The market instability index for each industry was calculated by assessing the linear trend of two dependent variables, the number of companies within the industry and the number of employees within the industry, by using simple linear regressions for the period of six years. Time was used as an explanatory variable, as presented in equations (1) and (2) below:

$$Y_{empt} = \beta_0 + \beta_1 t + \varepsilon_t , \quad t = 1,2,\ldots \tag{1}$$

$$Y_{compt} = \beta_0 + \beta_1 t + \varepsilon_t , \quad t = 1,2,\ldots \tag{2}$$

In equations (1) and (2), β_1 coefficient represents a regression slope, and its standard error (S_{b1}) was divided by the mean of the relating dependent variable ($\bar{Y}$). Thus, two indicators of market instability were calculated for each industry (number of companies and number of employees), as presented in equations (3) and (4). The market instability index is represented as the sum of the two indicators, as shown in equation (5).

$$MII_{emp_i} = \frac{Sb1_{emp_i}}{\bar{Y}_{emp_i}} , \quad i = 1,2,\ldots,25, \tag{3}$$

$$MII_{comp_i} = \frac{Sb1_{comp_i}}{\bar{Y}_{comp_i}} , \quad i = 1,2,\ldots,25, \tag{4}$$

$$MII_i = MII_{emp_i} + MII_{comp_i} , \quad i = 1,2,\ldots,25. \tag{5}$$

In order to assess the technology instability index, we analyzed the movements of the share of technologically innovative firms in the total number of companies within the industry over the period of the past six years.[2] The average value of the observed indicator for the said period is the technology instability index for a specific industry. The calculation of the technology instability indices is presented by equation (6) below:

$$TII_i = \frac{\sum_{t=1}^{6} \sum_{i=1}^{25} \frac{TIP_{it}}{UP_{it}}}{t} \qquad (6)$$

Data on the number of employees and number of companies per industry for the last six years were obtained from the Republic of Serbia's Statistics Office publication Enterprises by size and unincorporated enterprises in the Republic of Serbia, whereas the information on technological innovators per industry was taken from the Report on innovation activities of enterprises in Serbia.[3]

Finally, dynamism of a specific industry was presented as the sum of the obtained market and technology instability indices. Consistently with the original methodology [38, p. 700], the instability indices were standardized before summation. Index standardization was performed in order to ensure that the two instability indices are at the same a measuring scale and that they have equal impact on determining the industry dynamism index. In addition, in order to ensure positive value of the dynamism indices per industry, we added constant 3. Equation (7) illustrates the calculation of the industry dynamism index:

$$Din_i = Z(MII_i) + Z(TII_i) + 3, \quad i = 1,2,\ldots,25. \qquad (7)$$

The obtained market and technology instability indices and dynamism indices for each industry are provided in Table 1 within Appendix 2. Based on the assessed dynamism index, and using its average value as the borderline value (2.84), we classified all industries into two groups – static and dynamic industries. Following the said classification, the number of sampled companies operating within dynamic industries was 55, while there were 81 companies operating within static industries. Separation of the dynamic from the static industries was performed so that the impact of a change in the extent of corporate entrepreneurship on the firm performance could be separately analyzed in each of the two environment types.

Analysis and results

The literature review revealed contradictory conclusions with regard to the relationship between corporate entrepreneurship and firm performance. While some authors emphasize the plausibility of the ongoing initiation of entrepreneurial activities, others hold that excessive entrepreneurship may have a destructive impact on the performance. It is therefore justified to raise a question whether the relationship between the two variables changes after certain corporate entrepreneurship levels are reached, i.e., whether the relationship between corporate entrepreneurship and firm performance is identical for each level of entrepreneurial activities or it varies depending on the corporate entrepreneurship level attained by the firm. Moreover, consistently with the previous studies [31], [44], [49], [53], the present research uses as its starting point the assumption that the nature of the observed relationship and the effects of corporate entrepreneurship on the performance achieved will vary depending on the firm's environment dynamism. Taking all of the aforesaid into account, the central part of the methodological analysis refers to the examination of the nature of the relationship between corporate entrepreneurship and firm performance within the context of the environments in which medium-sized and large companies in Serbia operate.

To test the defined hypotheses, we performed a multiple regression analysis with three explanatory dummy variables. The said three dummy variables represent three different corporate entrepreneurship levels. As previously stated, the corporate entrepreneurship level is expressed as a value ranging from 1 to 5, with the interval divided

2 In selection of the market and technology instability indicators for the environments that the sampled Serbian companies operate in, the author consulted the creator of the elected methodology. Due to the small number of patents registered in Serbia (particularly by entities), which are used within the original instruments as the technology instability indicators, in the present paper the author used the share of the technologically innovative firms within the total number of companies in the specific industry as the technology instability indicator.

3 The report does not include data for processing industry, yet the results of the research on innovation activities for the observed period were subsequently obtained at the author's request (regular triannual survey of RSSO entitled Innovation activities of commercial entities).

into three sections: low, medium and high levels. The low level of corporate entrepreneurship, represented by variable *CE*1, covers values from 1 to 3. The medium level of corporate entrepreneurship, represented by variable *CE*2, covers values from 3 to 4, while the high level of corporate entrepreneurship covers values from 4 to 5 and is represented by variable *CE*3. Depending on the corporate entrepreneurship level of a specific firm, one dummy variable will have value 1 (the variable representing the corporate entrepreneurship level that the firm belongs to), while the two remaining variables for that firm will equal to 0 (the other two levels of corporate entrepreneurship that the firm does not belong to). As a dependent variable, we used the performance (ROA) achieved by the firm, here designated as . As the sample was divided into two segments, the analysis was first conducted for the group of companies within dynamic industries and thereafter for the group of those within static industries.

The regression model used is presented by equation (8) below, whereas the regression results are presented in Table 1.

$$ROA\_o_i = \beta_0 + \beta_1 CE1_i + \beta_3 CE3_i + \varepsilon_i, \quad i = 1,2,\ldots, 55. \quad (8)$$

As presented in Table 1 above, the regression results show that the set model's explanatory power, expressed by the coefficient of determination (R^2), equals 24.9%, whereas the adjusted coefficient of determination equals 22.0%. The model is statistically significant at the significance level of 1.0% (*F* test's *p* value equals 0.001). In addition, the estimated values of the intercept β_0 and the regression coefficient for explanatory variable *CE*3 are statistically significant, at the significance level of 1.0% (*p* values equal 0.000 and 0.010, respectively), while the estimated value of the regression coefficient for *CE*1 is statistically significant at the significance level of 5.0% (*p* equals 0.035). The estimated value of the constant β_0, which represents average firm performance at the medium corporate entrepreneurship level, equals 7.0%. The estimated value of the coefficient β_1, which represents a difference between the average performances of the companies with low and medium levels of corporate entrepreneurship, is negative and equals –5.2%. Consequently, the average performance of companies with low corporate entrepreneurship levels is statistically significantly lower than the average performance of companies with low corporate entrepreneurship levels and equals 1.8% ($\beta_0 + \beta_1$). On the other hand, the estimated value of the regression coefficient for explanatory variable *CE*3 is positive and equals 7.3%, which implies that the average performance of companies with high corporate entrepreneurship levels is statistically significantly higher than that of companies with medium corporate entrepreneurship levels. The average performance of

Table 1: Evaluation of the dummy variable regression model parameters – dynamic industries

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.499[a]	.249	.220	.0765796	2.375

a. Predictors: (Constant), CE3, CE1
b. Dependent Variable: ROA_o

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.101	2	.051	8.636	.001[b]
	Residual	.305	52	.006		
	Total	.406	54			

a. Dependent Variable: ROA_o
b. Predictors: (Constant), CE3, CE1

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	.070	.014		4.832	.000		
	CE1	-.052	.024	-.274	-2.160	.035	.897	1.114
	CE3	.073	.027	.339	2.672	.010	.897	1.114

a. Dependent Variable: ROA_o

Source: SPSS output.

companies with high corporate entrepreneurship levels equals 14.3% ($\beta_0 + \beta_3$). In this analysis, performed only on the sampled companies operating within dynamic industries, it may be claimed that there are statistically significant differences between performances, and that the best performance on the average is that of companies with a high corporate entrepreneurship level. In other words, in a dynamic environment, it is desirable to achieve as high a level of entrepreneurial activities as possible.

Based on the data presented in Table 1 (Durbin–Watson statistic equals 2.375; VIF coefficients equal 1.114 for both explanatory variables), we concluded that the model faced neither the problem of autocorrelation nor the problem of multicollinearity. Furthermore, based on the Shapiro-Wilk test of distribution normality presented in Table 2, it may be claimed that the residuals are normally distributed (*p*-value equals 0.164).

In the same manner as described above, we tested the relationship between corporate entrepreneurship and firm performance on the group of sampled companies belonging to static industries. The regression model used is presented by equation (9), and the results of the regression with assessed regression model parameters are shown in Table 3.

$$ROA\_o_i = \beta_0 + \beta_1 CE1_i + \beta_3 CE3_i + \varepsilon_i, \quad i = 1,2,\ldots, 81. \quad (9)$$

Compared to the regression results for dynamic industry enterprises, the model's explanatory power in case of the static industry companies sampled is considerably lower (with the coefficient of determination of 9.7%, and the adjusted coefficient of determination of 7.4%). In addition, based on the results provided in Table 3, it is evident that the entire model, as well as the estimated values of the regression coefficients for each of the explanatory variables *CE*1 and *CE*3, are significant at the significance level of 5.0% (where *F* test's *p* value equals 0.019, while *p* values for testing significance of the estimators of coefficients for *CE*1 and *CE*3 equal 0.017 and 0.029, respectively). As in the previous case of dynamic industry enterprises, the estimated value of the coefficient for *CE*1 is negative

Table 2: Normality tests of regression residuals with dummy variables in dynamic industries

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Standardized Residual	.141	55	.009	.969	55	.164

a. Lilliefors Significance Correction
Source: SPSS output.

Table 3: Evaluation of the dummy variable regression model parameters – static industries

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.311[a]	.097	.074	.0702650	1.536

a. Predictors: (Constant), CE3, CE1
b. Dependent Variable: ROA_o

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.041	2	.021	4.188	.019[b]
	Residual	.385	78	.005		
	Total	.426	80			

a. Dependent Variable: ROA_o
b. Predictors: (Constant), CE3, CE1

Coefficients[a]								
		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	.076	.011		6.897	.000		
	CE1	-.042	.017	-.275	-2.439	.017	.908	1.101
	CE3	-.051	.023	-.251	-2.224	.029	.908	1.101

a. Dependent Variable: ROA_o
Source: SPSS output.

and equals −0.042. This implies that in static industries as well, the average performance of companies with low corporate entrepreneurship levels is statistically significantly lower than that of companies with medium corporate entrepreneurship levels. A significant difference in comparison to the dynamic industry enterprises arises upon interpretation of the estimated value of coefficient β3 for explanatory variable *CE*3, which is here negative and equals −5.1%, while for dynamic industry enterprises it is positive and equals 7.3%. This means that, within the sample analyzed, the average performance of companies with high corporate levels is significantly below the average performance of the companies with medium corporate entrepreneurship levels. The average performance of the companies with medium corporate entrepreneurship levels, expressed by the estimated value of constant β_0, equals 7.6%. The average performance of the companies with high corporate entrepreneurship levels, presented as the sum of the estimated value of constant β_0 and the estimated value of the regression coefficient for *CE*3, equals 2.5%, and, as underlined above, it is statistically significantly lower than the performance of the companies with medium corporate entrepreneurship levels. In parallel to the previous case calculations, the companies with low corporate entrepreneurship levels have statistically significantly lower performance than those with medium corporate entrepreneurship levels, equaling to 3.4% (obtained as the sum $\beta_0 + \beta_1$). Based on the results obtained and presented above, we may conclude that, in contrast to the dynamic industry companies, the highest performance of the companies operating in static industries is achieved by the companies with medium (moderate) entrepreneurial activity levels.

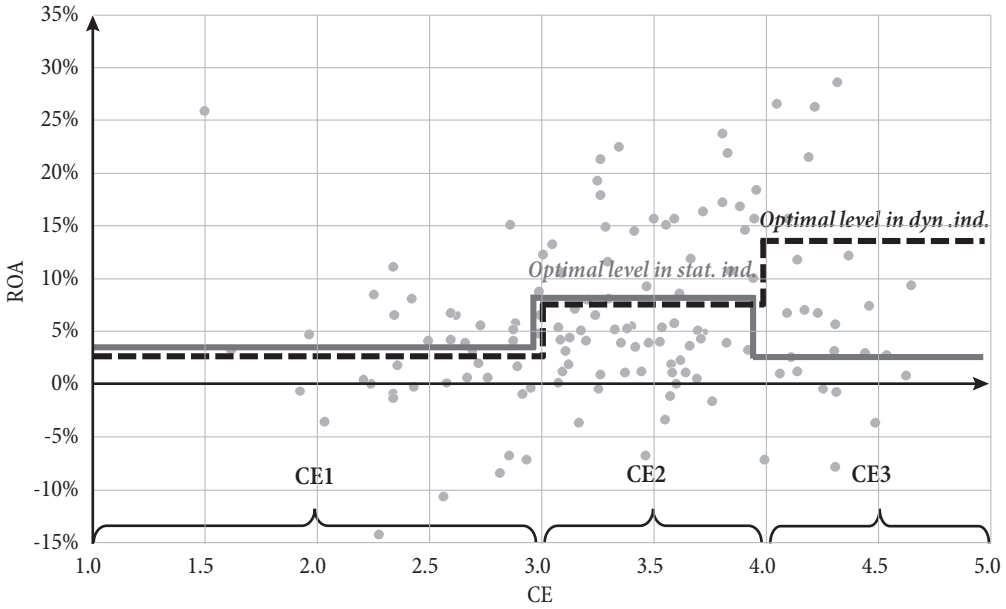
As with the dynamic industry enterprises examined, based on the value of the Durbin–Watson test of 1.536, we concluded that the model did not face a problem of obvious autocorrelation. There was no multicollinearity either, since VIF coefficients equal 1.101 for both explanatory variables (Table 3). With regard to the regression residual distribution assumptions, based on

Table 4: Normality tests of regression residuals with dummy variables in static industries

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Standardized Residual	.076	81	.200*	.982	81	.328

* This is a lower bound of the true significance
a. Lilliefors Significance Correction
Source: SPSS output.

Figure 2: Relationship between corporate entrepreneurship and firm performance



Source: SPSS output, supplemented by the author.

the normality testing using the Kolmogorov-Smirnov and Shapiro-Wilk tests (Table 4), the assumption of normal residual distribution cannot be rejected (p-values for the Kolmogorov-Smirnov test and Shapiro-Wilk test equal 0.200 and 0.328, respectively).

In the previous steps, we examined the relationship between corporate entrepreneurship and firm performance separately for sampled enterprises operating in dynamic industries and those belonging to static industries. We provide below a comparative presentation of the results obtained. More precisely, Figure 2 below illustrates the difference between the average performances of companies with different corporate entrepreneurship levels in dynamic and static industries.

In Figure 2, the dashed line represents the average performances of the companies for each corporate entrepreneurship level in dynamic industries, while the solid line represents the average performances of the companies for each corporate entrepreneurship level in static industries. Within dynamic industries, the highest average performance is achieved by companies with high corporate entrepreneurship levels. Contrary to this, in static industries, the highest average performance is achieved by companies with medium corporate entrepreneurship levels. In other words, the optimal level of corporate entrepreneurship, i.e., the level associated with the highest performance, is *CE*3 in dynamic environments, whereas in static environments, it is the *CE*2 level. Unlike companies operating in dynamic industries, where high corporate entrepreneurship levels are desirable, companies with such high entrepreneurship levels (above *CE*2) in static industries record, on the average, lower than optimal performance. All of the foregoing leads us to the conclusion that an optimal level of corporate entrepreneurship exists, and that such an optimal level is different for dynamic industry companies than that for static industry companies. Consequently, there is no sufficient evidence for rejecting our hypotheses *H*1 and *H*2.

Discussion and conclusion

The results of the analysis conducted and presented in this paper supplement the findings of the previous empirical research into the relationship between corporate entrepreneurship and firm performance. The overall conclusion reached is that an optimal level of corporate entrepreneurship exists, and that it is determined by the context within which companies operate. Although previous studies associated the optimal level solely with the medium (moderate) level of corporate entrepreneurship [4], [43], the results of the present research demonstrate that the optimal levels differ for companies belonging to dynamically different environments.

The results show that companies operating in peaceful, relatively stable and predictable environments will achieve the best performance at the medium (moderate) level of entrepreneurial activities. In contrast to such firms, those with high corporate entrepreneurship levels will record lower financial results. It is a paradox that the companies with high corporate entrepreneurship levels in such environments would achieve average performance, or even lower than that of the companies that are least prone to innovation. The following reasons for the foregoing are most commonly found in the literature [46, p. 112], [47, p. 355]: limited resources for implementing innovation; selection of a radical rather than an incremental innovation strategy, using up significant investment; due to already attained significant level of entrepreneurial activities, each further investment in new corporate entrepreneurship activities requires transfer of resources from the current operations, which makes their implementation even more difficult and has adverse effects on the successful functioning of the entire company. Kreiser [22, p. 287] confirms that frequent undertaking of risky entrepreneurial activities is not worth the effort, explaining that even those firms that operate on somewhat lower corporate entrepreneurship levels can achieve satisfactory performance.

In dynamic environments, the best performance is achieved by enterprises with the highest entrepreneurial activity levels, while those implementing little or no innovation at all record the poorest performance. This is consistent with the premise of numerous authors that the significance of entrepreneurial activities increases with the growing dynamism of the environment [44, p. 518], [53, p. 49]. The results obtained support the views of Kreiser [22, pp. 286-287] that in a dynamic environment,

proactive and entrepreneurially oriented firms are more able to position themselves better within their industry, exploit the market opportunities much sooner than their competitors, and create new opportunities for themselves by shaping the environment to their own advantage. In other words, the requirement for ongoing entrepreneurial action comes from the environment. Constant changes that corporate entities are faced with are an inexhaustible source of opportunity. However, if a company does not or cannot observe that or is unable to use the opportunity appropriately, the ultimate effect thereof on the business performance will be negative.

The foregoing also leads to the conclusion that low entrepreneurial activity levels are not desirable in the market, irrespective of the environment dynamism. In both dynamic and static environments, companies operating at a low level of corporate entrepreneurship achieve poor performance on the average. There must be a certain extent of innovation and entrepreneurial behavior, because the market requirements, although at a different pace, are always changing in the long run. Considering the context in which companies operate, the results of the present research suggest what the said extent is.

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Appendices

Appendix 1. Results of the reliability analysis for the individual factors and the complete instrument (SPSS output)

Table 1: Cronbach's alpha values for factors: new business creation, new product introduction and technological entrepreneurship

Reliability Statistics			Reliability Statistics			Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.755	.758	5	.870	.874	5	.870	.867	5

Table 2: Cronbach's alpha values for factors: mission reformulation, reorganization and system-wide change

Reliability Statistics			Reliability Statistics			Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.802	.806	3	.879	.880	4	.900	.901	6

Table 3: Cronbach's alpha values for the corporate entrepreneurship level (complete instrument)

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.938	.939	28

Appendix 2. Index of industry (business activity) dynamism for sampled enterprises

Table 1: Overview of the market and technology instability indicators and industry dynamism indices

Industry	Instability indicators				Dynamism index	Industry classification
	Market instability indices			Technology		
	#Employees	#Companies	Index			
Manufacture of computer, electronic and optical products	0.0159	0.0134	0.0293	66%	6.11	D
Manufacture of tobacco products	0.0262	0.0193	0.0456	50%	5.89	D
Financial and insurance activities	0.0186	0.0077	0.0263	34%	3.71	D
Manufacture of electrical equipment	0.0096	0.0084	0.0180	36%	3.41	D
Manufacture of basic pharmaceutical products and pharmaceutical preparations	0.0099	0.0163	0.0262	29%	3.36	D
Manufacture of weapons and ammunition	0.0071	0.0039	0.0110	39%	3.22	D
Information and communication	0.0112	0.0070	0.0182	33%	3.17	D
Manufacture of food products	0.0069	0.0049	0.0118	36%	3.06	D
Professional, scientific, innovation and technical activities	0.0084	0.0024	0.0107	35%	2.89	D
Manufacture of wearing apparel	0.0036	0.0070	0.0106	34%	2.84	D
Manufacture of basic metals	0.0027	0.0011	0.0038	38%	2.74	S
Administrative and support service activities	0.0082	0.0034	0.0116	32%	2.73	S
Electricity, gas, steam and air conditioning supply	0.0015	0.0020	0.0035	38%	2.69	S
Manufacture of chemicals and chemical products	0.0024	0.0024	0.0048	35%	2.57	S
Construction	0.0055	0.0110	0.0165	26%	2.57	S
Manufacture of leather and related products	0.0043	0.0134	0.0177	24%	2.52	S
Accommodation and food service activities	0.0087	0.0032	0.0119	28%	2.47	S
Manufacture of rubber and plastic products	0.0044	0.0026	0.0069	29%	2.31	S
Water supply; sewerage, waste management and remediation activities	0.0039	0.0111	0.0150	22%	2.26	S
Wholesale and retail trade; repair of motor vehicles and motorcycles	0.0074	0.0030	0.0104	22%	1.96	S
Printing and reproduction of recorded media	0.0058	0.0036	0.0094	21%	1.89	S
Transportation and storage	0.0024	0.0026	0.0050	25%	1.86	S
Manufacture of beverages	0.0057	0.0038	0.0095	20%	1.76	S
Agriculture, forestry and fishing	0.0013	0.0037	0.0050	23%	1.74	S
Manufacture of paper and paper products	0.0073	0.0072	0.0146	10%	1.38	S

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ACCRUAL ACCOUNTING AND FINANCIAL MANAGEMENT IN THE PUBLIC SECTOR IN DEVELOPING COUNTRIES

Računovodstvo zasnovano na obračunskoj osnovi i finansijsko upravljanje u javnom sektoru u zemljama u razvoju

Abstract

The objective of this paper is to show that a successful implementation of accounting represents infrastructural support for successful management therefore its content and structure should be more closely monitored in the function of increasing the effectiveness of the financial management, and not just in the function of execution of the objectives in the budget. The paper indicates that the essence of the reform of the accounting system and financial reporting by public sector entities is the use of the concepts and principles on which the financial reporting by private sector entities is based, or the transition to the financial reporting based on accrual accounting. Public sector managers who often do not see themselves as managers who manage available resources, but rather as managers who pursue a policy of some of the specialized public sector functions, need instead to be fully engaged in the financial management and control.

Keywords: *financial management, public sector, accrual accounting, accountability, developing countries.*

Sažetak

Cilj ovog rada je da pokaže da uspešna implementacija računovodstva predstavlja infrastrukturnu podršku za uspešno upravljanje; stoga bi sam sadržaj i strukturu računovodstva trebalo pažljivije pratiti u funkciji povećanja efikasnosti finansijskog upravljanja, a ne samo u funkciji izvršenja ciljeva u budžetu. U radu se ukazuje da je suština reforme računovodstvenog sistema i finansijskog izveštavanja preduzeća u javnom sektoru upotreba koncepata i principa na kojima se zasniva finansijsko izveštavanje preduzeća iz privatnog sektora ili prelazak na finansijsko izveštavanje koje se zasniva na obračunskoj osnovi. Menadžeri javnog sektora koji često ne vide sebe kao menadžere koji upravljaju raspoloživim resursima, već kao menadžere koji vode politiku nekih od specijalizovanih funkcija javnog sektora, treba umesto toga da se u potpunosti angažuju u finansijskom upravljanju i kontroli.

Ključne reči: *finansijski menadžment, javni sektor, obračunsko računovodstvo, odgovornost, zemlje u razvoju.*

Introduction

Around the globe there is an increasing focus on improving public financial management and reporting, in many countries, both the developed and developing. Developing countries and emerging economies are making important achievements in strengthening public financial management and governance.

In developing countries, public sector activities are marked by pronounced deficiencies and limitations. The most commonly observed are:

- a steady increase in public expenditure with a growing lack of funding for their financing,
- insufficient transparency of public spending,
- vague and non-transparent procedures of behaviour and defined responsibility of public authorities,
- an undeveloped system of values,
- inefficient public administration and financial management.

The public sector landscape is rapidly changing with an increasing emphasis on fiscal management and discipline, prioritization of expenditure and value for money. As a result it is even more important that international donors, governments, national and local institutions, including regulators and professional accountancy bodies, work together in partnership to achieve long-lasting improvements, transparency and accountability in public financial management [1].

The public sector is responsible for bringing together large amounts of resources to achieve a range of public goods. This responsibility comes with considerable complexity and expectation.

Financial management is an important tool that helps the public sector take care of money in a systematic, efficient, transparent, and legitimate way. Public sector financial management has three cornerstones [5]:

- Resource allocation (getting money),
- Controlled delivery (spending money),
- Accountability (reporting on money).

Public sector management framework

Successful execution of basic state functions presupposes customer-oriented, efficient and transparent management of its public interest operations and acceptance of public management's responsibility for achieving the expected high level of efficiency.

Unlike the entrepreneurial sector, whose success is measured by the amount of realized profit, performance of the public sector, individually and as a whole, is primarily measured by the degree of satisfaction of the general and common needs of individuals and the community in its entirety.

The degree of satisfaction of general and common needs is measured by the value and quality of output and by the impact of the outcome on the set goals and the social community in relation to available and spent resources.

The economic criteria of public sector entities generally include the indicators of economics, efficiency and effectiveness, and purpose. Economics means minimizing the necessary costs for achieving a certain level of income. In order to give an estimation of cost-effectiveness as an audit criterion, the ratio of costing and revenue is taken into account, and the purpose is to determine the maximum possible impact and the most favourable possible relationship between the total costs (money, labour and things) and the benefits that they want to achieve [2].

Efficiency deals with measuring the scope of achieving goals and the relationship between the planned and realized impact of an activity and can be defined as an instrument for improved program management, to increase accountability and better decision-making by providing feedback on outcomes and outputs of existing policies and programmes. For example, if the policy goal is to reduce unemployment, what needs to be proven is whether the reduction in the number of the unemployed identified is the result of the entity's activity, or the result of a general improvement in economic opportunities that the entity does not have any impact on. Third criteria, effectiveness and purpose, implies an assessment about the optimum execution of tasks by a government entity.

Using indicators that include input-output comparisons bears the risk of being incomplete, wrong definition of output or input distorts information about the performance of the state and its units. Other outputs can sometimes be too complex for coverage and they need to be valorised [11].

In the performance of some segments of the individual functions of the public sector it is possible to individualize the consumption of public goods or public services. As such, it is possible to clearly define the cases, with the recognition of the cost centre and cost carrier. This creates the preconditions for applying a variety of techniques and cost management methods applied by entrepreneurs.

Starting from the thesis that implementation of accounting represents infrastructural support for successful management, its content and the structure should be more closely monitored in the function of increasing the effectiveness of the financial management and evaluation of public management, not just in the function of execution of the objectives of the budget.

Public sector reform

The development and reform of the public sector actually move towards the same goal, and that is better management of public resources, while simultaneously reducing public expenditures, which at the same time should result in a better satisfaction of public needs. Good governance is linked to the development of the country that is being illustrated most often through the increase in gross domestic product [9].

The development of public sector management, i.e., new public management, is reduced to improving governance in the public sector. The fundamental characteristic of the concept of the new public management is to encourage more efficient management in order to achieve better business results [3]. A new management culture within the process of the new public management emphasizes importance of citizenship and responsibility of public management for the results achieved. The process also suggests structural and organizational changes that will contribute to a decentralized control through various possibilities of using the market mechanism in certain segments of the public sector. New public management, in addition, has the task of improving accessibility to the political authorities with the aim of raising the level of their effectiveness. Public sector reform means improving the efficiency and effectiveness in the public sector, strengthening the accountability of budget users towards users or customers of services or programmes, increasing benefits by reducing public expenditure, strengthening the management of state units with increased accountability.

In particular, the importance of financial management is emphasized in the public sector. The introduction of market principles, i.e., economic legality and rules of good governance in the public sector, also requires the redefinition of the role of public management. The role of public management implies acceptance of the responsibility for organized and effective action in the area of resource management and business, and control functions are more focused on maximizing the effects of limited resource management and achieving the set goals with the principle of minimizing costs and reducing budgetary burdens [3].

Accountability in the public sector

This special concept of public sector responsibility that has a very broad meaning implies the obligation of an individual or organization to account for their activities, to accept responsibility for these activities and to disclose the results of these activities in a transparent manner. It also implies liability for money or other entrusted property.

The application of this concept includes three elements:

- Taking into account that the public believes that the job for which someone is responsible will be done
- Providing detailed information on performed activities and achieved results
- Acceptance of responsibility for the results.

The basic characteristics of this concept are:

- Delegating authorizations and resources to an individual or organization
- Making an account for the effects and results for whose accomplishment someone is responsible
- Request to report on results, compliance with regulations and procedures, and on the efficiency of the activity
- An assessment of the implementation of this concept by the state auditor.

Financial management is an important instrument in applying the concept of invoicing. Effective financial

management is the most important requirement for the establishment and implementation of the concept of invoicing.

Public sector organizations prepare reports for many different users:

- Citizens
- The media
- Interested social groups
- Legislative bodies and boards of directors
- Monitoring institutions
- Government institutions
- Individual and institutional donors

Beneficiaries of performance reports and financial results

Effective implementation of the concept of accountability ensures transparency of the functioning of public sector organizations and strengthens their credibility. The broadest public and each of the aforementioned beneficiaries are convinced that public funds are spent legally and that the public interest in this domain is sufficiently protected. Establishing a liability mechanism is useful and represents also an important factor in the performance of public sector organizations.

Unfortunately, public sector organizations are exposed to various risks from the environment in which they operate, so constant improvement of responsibility and control is the best way to reduce harmful effects. The costs of introducing and maintaining control mechanisms should be appropriate to those risks.

The principal characteristics of accountability relationships in the public sector

Assignment of authority, power and resources: This is the downward delegation of duties to an individual or organization. This can be by law, by policy, by way of formal delegation matrices or by the completion of an organizational work plan, budget distribution and performance contracts. It can also be implicit or indirect, such as using formal position descriptions to describe duties that have delegations of authority in them and a statement of expected duties to be performed and, possibly, outcome expectations.

Accountability for performance and results: This is the yin and yang of the above. In accepting the authority, power and resources, the individual or organization also takes on the responsibility to perform the work and account for the results.

Assignment of duties: In assigning duties formally, the granting authority also provides clear direction, legislative or regulatory guidance, resources consistent with the expectation.

Requirement to report: The necessity to report in a formal way, often prescribed by the granting authority deals with three elements:

- Results achieved
- Compliance to legal and procedural requirements
- Efficiency

Judgment exercised: At some level, be it within the organization and with the public at large, public sector accountability involves the right of the granting authority to make judgments about how the accountability has been exercised and act on that judgment. In the ultimate test in a democracy such as ours, that may mean the downfall or re-election of a government. In more mundane terms, it may be a clean bill of health for a financial statement by a legislative auditor [5].

Financial management, because of its systematic reporting character, is an important tool of accountability. Financial reports contain information in a prescribed and, at times, legislated format. They also indicate how the individual or organization has provided good management and stewardship of funds. They can provide information on the results achieved, although only in limited ways [5].

Public sector accounting reform

Public sector accounting reform according to its usefulness in the process of decision-making is an important component of the implementation of the concept of the new public management. Reforms of the accounting information system within this concept are directed towards the standardization of accounting rules and procedures for financial reporting, which facilitates the convergence of

public sector accounting and accounting of the for-profit sector. It can be said that in the majority of developed countries the process of implementing a set of reforms called the new public management is at the end, and you can already see the effects of the reforms implemented. This primarily relates to the successfully implemented reform of the public sector accounting information system. Implementation of the concept of occurrence of events and the development of cost and managerial accounting in the public sector and the budgetary system have set up an information basis for the development of modern public management. The OECD applies the concept of the occurrence of events or variants of the concept of the occurrence of events in the accounting and financial reporting of the state unit and / or budget, or is in the process of its retention [13].

Accrual and cash basis accounting

Accrual accounting is based on the principle of causality. It implies recognition (recording) of income in accounting records when they are "earned" and the recognition of expenses when goods or services are "used" to generate income. The purpose is to measure the results of the activities achieved during the accounting period.

The cash basis accounting is based on a fact that revenues are recognized when money is received, and expenses when payment is made. This accounting principle measures the amounts of money received and paid during the accounting period, so the results of the activities achieved in that period cannot be measured.

Cash accounting requires the record of inflows and outflows of cash. Conversely, accrual accounting requires revenue to be recognized in the period in which economic benefits can be measured reliably [8]. Likewise, expenses are recognized when the consumption of goods is capable of reliable measurement [7]. There are several reasons why the move to accrual accounting was inevitable. Firstly, accrual accounting offers the benefits of improved accountability and improved resource management [4]. This claim has been supported by evidence suggesting that the cash system provides inadequate information for the full costing of operations. Accrual accounting, on the other hand, is said to improve decision-making by providing information on the full cost of operations and the resources used to deliver services to the public [4]. This is increasingly important for those business units which are commercializing to enable them to recover the cost of products and services. Finally, accrual accounting gives governments the opportunity to minimize their costs through cost identification [6].

Limitations identified from the adoption of accrual accounting include the fact that it can lead to the misallocation of resources and an inadequate disclosure of the size of assets and liabilities. This reduces the organization's ability to account for the full cost of programmes due to fluctuations in costs [8].

The introduction of accrual accounting has many implications, including the preparation of accrual financial reports, the operation of government entities according to the accrual management systems, the preparation of whole-of-government financial reporting and preparation of accrual-based budgets [6], [12], [14].

Advantages and disadvantages of the accrual accounting and the cash basis accounting

Accrual accounting

- It is much more complex than cash basis accounting, since two important accounts are introduced into accounting: customer receivables and liabilities towards suppliers,
- It provides better financial management because it provides a more complete picture of the financial position of the organization,
- Provides a better overview of costs that are not limited to one year.

Cash basis accounting

- Easy and easy to understand,
- It does not provide a complete picture of the financial position of an organization, and therefore provides limited financial management options.

Cash basis accounting is now used in many countries, but, at the international level, one can observe a tendency of gradual transition to the accrual basis.

This contributes to the need to improve financial management in public sector organizations, so that the results of programmes implemented by these organizations are observed for a longer period than one year.

In the public sector, a modified accrual basis is also used. A modified accrual basis accounting can be considered as a partial application of the accrual basis accounting.

The application of the accrual accounting is a condition for the improvement of financial management in public sector organizations.

There is a strong tendency in government to focus on how much cash is needed in a public sector budget. This has led to the dependence on the approval of cash expenditures, otherwise known as appropriations. Appropriations are generally made for a one-year period, with some exceptions for capital projects. With the accrual system, the full costing is better displayed and not restricted to a single year.

The restriction of budgetary approvals to one year at a time can distort or fail to reveal the true overall cost over time of a particular programme or purchase. Cash accounting satisfies the annual budget-based interests of legislators and is simple in its presentation, but has a number of serious drawbacks, including [5]:

- Failure to accurately represent the amount of resource usage. For instance, a large capital acquisition will distort expenditure upward in the first year, but the usage of that asset will not be recognized in the following years.
- Failure to take account of future commitments, guarantees, or other contingent liabilities. A liability will not be recognized until the cash is paid to settle the debt.
- Concentration on cash payments alone, sometimes resulting in an unnoticed deterioration in fixed assets.

Financial information produced by accrual accounting allow evaluation of total assets by an entity controlling and evaluating the expediency of usage of these assets, performance evaluation, financial position and cash flows of the entity and making decisions about future ways of providing services and their financing. Due to these facts, public sector reforms are, as a rule, followed by public sector accounting reforms, which in essence constitute a transition from cash accounting to accounting based on the accrual method.

An accounting system based on a cash basis and an accounting system based on an accrual basis are extremes between which there are a number of systems that represent more or less different modifications of one or the other.

In principle, there are two basic modifications of the cash accounting system. One type of modification is an extension of the period in which cash payments and payments are recognized as billing and payments of the observed reporting period in relation to its calendar ending. Such modification is allowed only on the condition that the causes of the occurrence of these cash collections and payments of the transactions or events occurred in the observed reporting period. This modification actually extends the focus of accounting from cash to current financial assets. Another type of modification of the cash basis is the requirement to disclose specific additional positions that are characteristic of the accrual basis. The number of possible variations of these basic modifications and their combinations, or the number of different accounting systems based on a modified cash basis, is virtually unlimited.

Modifications to the accounting system based on an accrual basis are also numerous and more or less different from each other, but all of them are essentially reduced to: non-recognition of certain (specific) positions of assets and liabilities, resulting in the inability to recognize certain income and expenditure positions, or the use of different bases for the recognition of the elements of the financial statements, or the use of an accrual basis for the recognition of assets, liabilities and some expenses, and cash or modified cash bases for the recognition of revenues and some expenses. When it comes to the first type of modification, in practice the most frequently encountered is the situation in which either the entire permanent asset or its individual parts (such as infrastructure objects and assets that make the cultural and historical heritage of the community concerned) are not recognized. The non-recognition of all or part of the permanent assets produces effect not only on the structure and content of the Financial Statement Report, but also on the structure and content of the Financial Performance Report. Namely, when applying

such a modified accrual basis, the acquisition value of non-recognized assets is recognized as an expense in the period of its acquisition, which, among other things, prevents the recognition of depreciation costs in the periods of use of assets, and at the time of their possible sale it requires recognition of the total sales value as a gain on sales. In principle, in the reporting models for different types of modified accounting bases, the same financial statements as in the reporting model for the accrual basis are prepared and presented, except that in the case of non-recognition of a significant part of the assets, the name of the Financial Performance Report is Income and Expenditure Report.

Factors and effects of contemporary public sector reforms and public sector accounting

Characteristics of the entities involved in the public sector are: financing from public revenues and public interest functions. Modern countries through their regulatory, economic and redistributive functions transfer funds, measured by billions of money units, from private to public sector, with the aim of improving their social and economic characteristics. The public sector is entrusted with assets acquired by generations, which are expected to have effects on the well-being and well-being of the next generations. Due to the volume and value of the entrusted property and due to the fact that inefficiency, or poor investment decisions in the public sector have far-reaching consequences on the state of the nation as a whole, taxpayers or citizens have the right to the availability of information in which the public sector as a whole and its individual parts express public responsibility(s) for the performance achieved and the ways in which public resources are used. This task is realized by public sector entities through their accounting system, i.e., by preparing and presenting financial statements. In a small number of surveys, the analysis of the role and influence of the state on the development of accounting practice and profession are carried out. They used the critical approach in most cases, and mainly dealt with the development of an accounting profession organization, while the development of accounting practice was almost completely ignored. The common characteristic of both types of research is their conception of the assumptions of a hegemonic concept that structures that have political leadership or hegemony determine the type of dominant outcomes of most of the activities in one society and therefore the accounting system in the public sector.

The beginning of the period of economic neoliberal hegemony, which continues to exist today, is placed by most authors in the field of accounting history in the period when the energy crisis produced an economic crisis in most of the developed countries whose main characteristic was stagflation, and economic stagnation. These developments have led to increased demands for economic support of the state to the "troubled" private sector, on the one hand, and strengthening its role in maintaining the achieved level of social well-being with other parties, on the other hand. However, many economists, including the most prominent Milton Friedman, have seen this active role of the state as the main cause of stagflation and have advocated that its activities are limited solely to ensuring a stable supply of money. Discussions about the role of the state in economic life, which lasted during the 70s, 80s and 90s of the last century, in addition to monetarism, have also resulted in the concept of rational expectations, the theory of real business cycles, and neo-xenianism. The crisis has also strongly affected the public sector, which has led to stagnation and declining public spending and increasingly loud requests for its reform. Reforms have also been triggered by a wave of innovations in public sector accounting, which in this period continues to develop the application of private sector-specific management techniques (but now targeted, first and foremost, at the efficiency of public expenditure) and again focuses on financial reporting.

Factors of contemporary public sector reforms

Public sector reform and public sector accounting reform are one of the rare common features of almost all countries in the world. The main drivers of all reform processes in the public sector, although they differ from one another, depending on whether they are developed industrialized countries, developing countries, or countries that have until recently been behind the "iron curtain" (countries

in transition) come from the four spheres: 1) political, 2) social, 3) economic and 4) institutional [10].

1) In the countries that were in the process of transition in the 1980s and 1990s, the initiators of reform processes from the political sphere initiated a change in relations between the state and its citizens. Transformation of this relationship inevitably implied the implementation of changes in the then applied way of managing parts and the whole of the public sector, the establishment of democratic institutions and the development of a civil society related to them. The political drivers of reform in developing countries are the result of pressure from citizens on the state, that is, of their expectations that the state finds a way to encourage and speed up economic development in order to reach the level of developed economies. However, despite the fact that both the countries in transition and the developing countries aimed at reaching the level of economic development of developed countries, this does not mean that the governments of developed countries were not exposed to the reform pressure underlying the political one. The main source of this pressure is the increasingly intense economic globalization that, in addition to the obvious economic benefits to these countries, has also brought about a multiple increase in the risk of terrorism. Activities aimed at improving the prevention of terrorist attacks, as part of the national defence system, have caused a significant increase in budget expenditures for these purposes. Governments of developed market economies have thus faced the problem of simultaneously responding to the opposite demands of their citizens: on the one hand ensure a high level of not only national security but also other public services, and on the other hand reduce the size of the public sector and the amount of expenditure associated with it. However, political stimulus to public sector reform, regardless of the described different conditionality, has a common characteristic in all countries - re-examining the role of the state in society.

2) In developing countries, the fundamental problem in the social sphere was the establishment of a society on the principles of equal rights for all citizens. In the transition countries, the process of re-establishing civil society institutions and promoting its core values was being played. Population in developed countries was exposed to increasing restrictions and challenges that made it difficult, if not even impossible, to preserve the attained level of living standard. The common characteristic for all countries was the exposure of their inhabitants and economies to the ever-growing demands of the Third Industrial Revolution - the Information Revolution.

3) On the economic scene in the 70s and 90s of the last century, a whole series of economic crises has developed, and they have continued to have far-reaching economic, social and political consequences. The series started with the First and Second Oil Crisis. Changes in the prices of the oil importing countries could not be financed without the significant use of budget funds, which resulted in extremely high budget deficits. The consequences of the Second Oil Crisis - a sharp decline in economic growth rates, the growth of inflation rates and a drastic rise in interest rates - in developed and developing countries, led to the 1982 Global Crisis. On the one hand, developing countries were - debtors - who could not service their external debt, and on the another hand developed countries - creditors - who could not collect their claims. Given the intensity and long-term effects of this crisis, the International Monetary Fund, the World Bank, the Paris and London Club have been intensively involved in its resolution. The beginning of the next crisis was precisely dated - October 19, 1987 - Black Monday, when all the major world stock exchanges, starting from Hong Kong to New York, collapsed within a day. Among economists, there is no consensus on what caused such a catastrophic fall in stock prices in such a short time, and many believe that the work was a black swan effect. However, it is likely

that the causes of crash could be found among widespread phenomena and events. The most significant widespread phenomena are:

a. stock exchanges around the world were increasingly intensively traded with derivative financial instruments without the synchronization of trends in this segment of the market with movements on the part of the market in which equity instruments were traded - shares,
b. Computer trading has become the dominant mode of trade of large investment corporations and funds, and
c. Growth of return on investment in long-term bonds made them more attractive in relation to shares.

4) The fourth group of factors that triggered reform processes in the public sector of different countries makes changes in the institutional sphere [10].

Within the European Union, supranational structures were formed that take over the prerogatives that until then were in the exclusive jurisdiction of sovereign states, of which it is of particular importance for this work to define the state's economic policy and to evaluate its performances.

The most important international organizations - the United Nations, the World Bank, the International Monetary Fund, the Inter-American Development Bank, the World Trade Organization and the International Bank for Reconstruction and Development - are increasingly dominant in defining and shaping the world community in economic and political terms.

A large number of national and international non-governmental organizations have been formed, whose attitudes have become extremely important in all political and social events.

Research methodology

The authors conducted a survey on a sample of professional accountants and managers of public sector entities. A segmentation of both groups of subjects is based on whether the respondent had professional experience in private sector entities or not.

Answers to questions in the survey were compared using the Pearson's chi-square independence test which checks whether there is a link between the experience in the private sector and the answers to the questions asked in the survey. The test consists of comparing the number of recorded responses with the expected values that we will receive in the case the answers do not depend on the experience of the respondent.

The key research assumption was:

Accounting and internal reporting in the public sector is performed on an accrual basis.

Financial management in the public sector is efficient if represented with integrated framework involving all managers' expertise, resources, and control.

Results of quantitative analysis of survey data which examined the views of professional accountants

A segmentation of a sample of professional accountants has been performed on a group of professional accountants who previously had professional experience in private sector entities and those without such an experience.

The question in the survey was "Does the institution in which you work use accrual basis for the internal reporting of the accounting records?"

The results of the assessment of the application of accounting records on an accrual basis performed by accountants with and without previous professional experience in private sector entities are given in Table 1.

Table 1: Number of responses (and percent of participation within the group) to the question about using accrual basis in the institution

	Yes	No	Total
Accountants with previous experience	9 (5.04%)	47 (94.96%)	56 (100%)
Accountants without previous experience	9 (6.12%)	59 (93.88%)	68 (100%)
Total	18	106	124

Source: *Authors' calculations.*

Within this question, there was a section in which respondents were asked, if the answer to the question is "yes", to indicate in which types of records or reports the provisions were applied. Of the 18 respondents who

responded in this way, only 6 satisfied this requirement and provided an explanation that this option is used to record liabilities to suppliers, customer receivables and value added tax.

By the Pearson's chi-square independence test we checked if there is or there is not a significant relationship between the answers of accountants and their previous experience in the private sector. The value of chi-square statistic is χ^2(1,124)=0,199 and the significance of the test is p=0,655, so we cannot reject null hypothesis that the number of answers of accountants with previous experience is equal to the number of answers of accountants without previous experience.

Based on these results, it is possible to conclude that most professional accountants claim that in public sector entities the possibility of using accrual accounting for internal reporting purposes is not used.

The next question that was asked was "Do you think that the accounting system in your institution provides information that enables real - essential control of the efficiency and effectiveness of the use of public/budget funds?", and the following answers were obtained.

The results of evaluating an entity's accounting system in terms of its ability to provide essential control of the efficiency and effectiveness of the use of budgetary resources by an accountant with and without previous professional experience in private sector entities are given in Table 2.

Table 2: Number of responses (and percent of participation within the group) to the question about ability of accrual basis method to provide essential control of the efficiency and effectiveness

	Yes	No	Total
Accountants with previous experience	39 (69.64%)	17 (30.36%)	56 (100%)
Accountants without previous experience	55 (80.8%)	13 (19.1%)	68 (100%)
Total	94	30	124

Source: *Authors' calculations.*

69.64% of accountants with previous professional experience in private sector entities believe that the accounting system in the entity in which the employee is employed produces data that allow for essential control of the efficiency and effectiveness of budget funds, and 80.8% of accountants with no previous professional experience in private sector entities share the previously stated position.

Independence of answers was again tested by the Pearson's chi-square test. In the case of this question, the value of chi-square statistic is χ^2(1,124)=2.115 and the significance of the test is p=0.146. So, same as in the case of the first question, because the p–value is greater than the significant level of 0.05, we cannot reject null hypothesis that the number of answers of accountants with and without previous experience is equal.

It can be concluded that most professional accountants, independently of previous experience, agree with the view that cash accounting is an adequate means of controlling the spending of the allocated funds

For the question "Which of the following statements describe you best?", there were five possible statements offered:

1) I know that there is accounting based on an accrual basis, but only at the level of information.
2) I am familiar very superficially with the differences between cash basis and accrual accounting.
3) For the application of accrual basis accounting, I would need further professional training.
4) The differences between cash basis and accrual accounting are fully known to me.
5) I am competent to apply accrual basis accounting.

The results of self-evaluation of professional competence performed by accountants with and without previous professional experience in private sector entities are given in Table 3.

Table 3: Self-evaluation of professional competence performed by accountants

	1	2	3	4	5	Total
Accountants with previous experience	5 (8.9%)	8 (14.4%)	12 (21.4%)	20 (35.7%)	11 (19.6%)	56 (100%)
Accountants with previous experience	10 (14.7%)	8 (11.8%)	23 (33.8%)	21 (30.9%)	6 (8.8%)	68 (100%)
Total	15	16	35	41	17	124

Source: *Authors' calculations.*

Out of a total of 124 respondents, 19.6 or 8.8% said they thought they were competent to apply accounting based on an accrual basis. This attitude is more pronounced

in accountants with previous professional experience in private sector entities, which confirmed the starting assumption of the sample segmentation.

On the basis of the obtained results, it can be concluded that when transferring to financial reporting based on accrual accounting, approximately 28.2% of accountants employed in public sector entities would need to receive additional education in the area of accounting and financial reporting based on an accrual basis.

Based on the conducted survey, we can draw the following conclusions:

- accountants show dissatisfaction with the current way of regulating the field of accounting and accounting system, and indirectly it can be concluded that there is readiness for changes in this area and
- if the state decides that the accounting and financial reporting of public sector entities will be settled in accordance with accounting requirements on an accrual basis, they will have to find adequate resources to carry out, in an organized manner, activities aimed at professional development of accountants and to face the costs of these activities.

Results of quantitative analysis of survey data which examined the views of managers of public sector entities

Between these two categories of managers, i.e., the ones with previous professional experience in private sector entities, and those without such experience, there are significant differences in relation to their knowledge of the accounting system-based characteristics and their professional competence in this regard.

The answers to the question *"Does the institution in which you work use accrual basis for the internal reporting of the accounting records?"* provided the following results:

- of the 10 managers with professional experience in the private sector 4 gave a negative, and 6 a positive response and
- of the 15 managers without professional experience in the private sector, 10 gave a negative, and 5 a positive response.

Within this question, there is a section in which the respondents were asked, if the answer to the asked question is "yes", to indicate in which types of records or reports the provisions applied: of the 11 managers who answered "yes" (6 of them with previous professional experience in private sector entities), only 5 met this requirement and provided an explanation that this option is used to record obligations towards employees.

Like in the case of accountants, the Pearson's chi-square test was also conducted. But since the condition requiring that there be more than 5 responses in all fields was not satisfied, the Fischer's exact probability test was applied. The p–value obtained in that way is p=0.241, so the answers given by managers do not depend on their experience in the private sector.

Based on these results, it is possible to conclude that in most public sector entities, the possibility of using accrual accounting for internal reporting purposes is not used.

This behaviour of management can be explained in two ways:

1) Managers do not have the motive to behave differently because their performance (performance) is measured exclusively by the degree of compliance of the realized cash inflows and cash outflows of the entities with their budget or the financial plan envisaged sizes.
2) Insufficient professional skills of managers prevent them from using the information produced by such an accrual basis accounting system, and consequently, it is not applied in the entities in which the employees are employed.

Conclusion

Public companies are a special category of companies, owned by the state and local governments. Economic growth and social stability can only be provided by a transparent government. Developing new practices and procedures for the management of the public sector is one of the conditions that would make a government accountable. Launching an understandable set of international accounting standards in the public sector, which would allow for comparisons

between different governments in different parts of the world, is one of the possible approaches.

Contemporary public sector reforms in various countries in the world were caused by factors that promote the political, social, economic and institutional spheres. Different strategies have been used to implement the reforms with the common characteristic of the goal - improving the efficiency, effectiveness and transparency of public sector entities' activities. Public sector entities, traditionally applied cash basis accounting that cannot meet the information requirements, due to which modern public sector reforms are accompanied by reforms in its accounting system and financial reporting.

The essence of the reform of the accounting system and financial reporting of the public sector entities is the use of the concepts and principles on which the financial reporting of the private sector entities is based, or the transition to financial reporting based on accrual accounting. The financial statements of public sector entities should be prepared and presented in accordance with accounting requirements based on an accrual basis.

Financial management and control require the engagement of all managers. Public sector managers often do not see themselves as managers who manage available resources, but rather as managers who pursue a policy of some of the specialized public sector functions.

The often resulting tensions between financial and operational managers are normal and even useful if they contribute to solving the problems at work. In practice, all managers should be involved in financial management and control.

Between the two categories of managers - the one with previous professional experience in private sector entities, and the other without such an experience - there are significant differences in relation to their knowledge of the accounting system-based characteristics and their professional competence in this regard.

It is necessary to develop the internal capacity to assess risks that may affect the realization of the objectives of key institutions, and according to the judgment, define and incorporate control activities in all business processes in order to minimize irregularities and ensure the integrity of business processes. Increasing accountability for an efficient and effective, and appropriate use of public funds is the main objective in the public sector. Integrated activities should be directed towards achieving this goal by strengthening managerial accountability of managers for the legitimate and purposeful use of public funds.

This paper adds to the literature on financial management and public accounting with empirical research and data analysis from the performed survey. The survey was conducted on a sample in a single country, therefore it could be difficult for generalization of the results, but it can be used for benchmarking with similar single-country surveys, or as a support tool for multi-country research studies to generate broader results on public accounting and financial management.

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BRAND AWARENESS AND ITS INFLUENCE ON MARKETS AND CONSUMERS' PURCHASE INTENTIONS IN SERBIA

Svest o brendu i njen uticaj na tržišta i kupovne namere potrošača u Srbiji

Abstract

Brand awareness is a strong influential construct and market factor in a marketing environment. Purchase intention is the result of various marketing constructs affecting the decisions of consumers. In addition, purchase intention presents the culmination of different market factor influences on the consumer. And vice-versa – purchase of goods and consumer behavior have a strong impact on the market which further affects the overall economy. The goal of this research is to analyze brand awareness and its influence on consumers' purchase intentions and determine the manner in which it can shape the market and economy. Why is this analysis important? Not only do consumers' purchase intentions affect markets and macroeconomy, but they can also have major impact on business performance of companies. Therefore, investigating brand awareness as a potential factor of influence on consumers' purchase intentions is almost a necessity. To support the main hypothesis, brand reliability, brand credibility, and brand loyalty are analyzed as mediating constructs. Significant data was collected from 418 participants from Serbia and thoroughly analyzed. The findings are interesting and indicate a positive relationship between the measured factors.

Keywords: *brand awareness, market factors, economic factors, brand reliability, consumer behavior, purchase intention.*

Sažetak

Svest o brendu je jak uticajni konstrukt i tržišni faktor u marketing okruženju. Kupovne namere su rezultat različitih marketing konstrukata koji utiču na ponašanje potrošača. Dodatno, kupovne namere su kulminacija uticaja različitih tržišnih faktora na potrošača. I obrnuto, kupovina dobara i ponašanje potrošača imaju jak uticaj na tržište što dalje utiče na ekonomiju. Cilj ovog istraživanja je analiza svesti o brendu i njenog uticaja na kupovne namere potrošača i način na koji može da utiče na tržište i na ekonomiju. Zašto je ova analiza važna? Kupovne namere ne samo da utiču na tržišta i na makroekonomiju, već imaju i snažan uticaj na poslovne performanse kompanija. Stoga, istraživanje svesti o brendu kao potencijalnom uticajnom faktoru na kupovne namere potrošača postaje skoro pa nužnost. Da bi podržali glavnu hipotezu, pouzdanost brenda, kredibilitet brenda i lojalnost prema brendu su takođe analizirani kao posredni konstrukti. Značajni podaci su prikupljeni od 418 ispitanika iz Srbije. Rezultati istraživanja su interesantni i indikuju pozitivne odnose između posmatranih faktora.

Ključne reči: *svest o brendu, tržišni faktori, ekonomski faktori, pouzdanost brenda, ponašanje potrošača, kupovne namere.*

Introduction

In the modern economic era, market performance is crucial for the survival of companies. In the constantly changing business environment, companies have to adapt their business models in order to maintain and obtain more competitive positions on the market [11]. For companies, long-term strategies and strategic management techniques play an important role in sustaining competitiveness on the market [24, p. 122]. Strategic management includes planning and defining goals, analyzing the competition on the market, allocating resources and other activities in the long term. Now, developing brands is a crucial part of strategic management from an economic standpoint, as developing brands is essentially creating value, similarly to products and services [44, p. 520]. Serbia's economy is currently unbalanced as a result of an unfruitful systematic transition. Therefore, Serbia requires theoretical and institutional platforms, as well as adequate policy platforms in order to thrive and establish dynamic growth [25]. How does, or better yet, how can brand awareness play a role in the economic landscape?

According to some research, brand awareness is important for companies in order to achieve adequate performance on the market [37]. In the same research it was noted that brand awareness has a stronger impact on the performance of companies which operate on homogenous markets. According to the research of Woodward, published in 2000, brand awareness influences brand equity through creating a node for initial attachment of the customer to the brand [63]. Certainly, brand awareness has a positive impact on perceived quality [49]. Companies developing high-quality goods can invest in brand awareness [31]. Consumers are more attracted to high-quality products and often base their decisions on perceived quality [44, p. 364]. Consumers' decisions can and will shape markets. The status of various markets in a country further affects the overall economy. This indicates that brand awareness, as a marketing construct, has the potential to affect markets and economies. Further, it is evident that brand awareness and other brand related constructs, such as loyalty and credibility, are not only marketing constructs, but market factors and market makers as well. The situation is so complex, that branding as an element of marketing strategies suddenly has the potential to affect the macroeconomic situation in a country.

Now, how can these assumptions be analyzed? And why is that important? Firstly, consumers' purchase intentions are the main element of and initial point in exploitation and circulation of goods and services. More objectively defined, consumers' purchase intentions present the starting point of value circulation on the market. Therefore, it is important to analyze brand awareness and its effect on consumers and their purchase intentions.

In this paper, the relation between brand awareness and consumers' purchase intentions is observed. Brands play a role in the consumers' decision-making process and affect their identification with products [59]. In addition to the two main constructs, brand reliability, brand credibility, and brand loyalty are observed as mediating constructs. The secondary goal is to understand to what degree these constructs affect the relationship between brand awareness and purchase intentions and how all of these affect the market. There is a large body of literature that addresses these marketing constructs, but the number of studies that include brand reliability, brand credibility, and brand loyalty as mediating marketing dimensions is low.

The first section of this paper provides a theoretical background through extensive literature review. The second section presents the main and auxiliary hypotheses and the research framework. The following section provides, a brief description of the research methodology followed by the results of the research. The discussion part of this study comments on the findings, outlines the contributions of this paper, and compares it to similar research in this domain. Finally, conclusions are drawn based on the conducted analyses.

Literature review

Brand awareness

Brand awareness can be presented and described as the consumer's ability to recognize or recall a brand name from a logo in different situations [1]. In the early research of Hoyer and Brown, published in 1990, it was noted that, when awareness was present, consumers were more likely

to choose the brand that they are aware of [38]. Brand awareness was described with two dimensions: depth and width [36]. These dimensions define the behavior of the consumer and indicate that, when a consumer sees a brand name, they will recall the specific products linked to that brand. Through brand awareness, consumers can easily recognize a brand when searching for a product and make a buy or skip decision [30]. The brand name is the key element of the brand awareness construct [20]. Brand awareness is crucial for good market performance [37]. In the same research it was concluded that the influence of brand awareness on market performance was stronger in homogenous market segments. Similarly, in another study, it was concluded that creating brand awareness was important for developing competitiveness in dynamic markets [54]. Brand awareness can trigger different responses on how consumers process information [38]. An interesting research indicated that brand awareness was positively correlated with consumers' association with price fairness [56]. If we take into consideration that consumers are the ones that shape the market and that the complex relationship between markets further affects the economy, it is safe to propose that brand awareness as marketing and market factor plays an important role not only for companies, but also for developing and maintaining economic prosperity. Branding certainly brings value to products and services; consequently, products and services under high-value brands bring more value to the manufacturer, consumer and to the market as well. Additionally, in order to evaluate the influence of brand awareness on consumers' behavior better, brand credibility, brand reliability and brand loyalty are also measured.

Brand credibility and brand reliability

Brand credibility can be described as the result of compatibility perception between a social cause and a brand [9]. Previous research of Erdem and Swait, published in 2004, described brand credibility as the consumers' perception of the brand's ability to deliver on promises that were made [29]. It was suggested that brand credibility was positively correlated with brand choice [5]. Brand credibility increases perceived product and service quality, thus further increasing expected consumer utility [28]. Another study argued that brand credibility was one of the most influential marketing constructs defined in marketing literature [61]. Consumers' perception of developed relationships was crucial to consumers' behavior on the market [40], [42]. This concept is part of the relationship marketing theory noted in the early research of Morgan and Hunt, published in 1994 [51]. Brand credibility is crucial when it comes to customer perception of the marketing environment that includes prices, advertisements, direct marketing and online marketing [64]. Brand credibility is an integrated whole of past brand-consumer actions, present brand image, and consumers' perception of the brand's ability to keep promises that were made [29]. Brand credibility also influences brand reputation [45]. Further on, brand reliability is directly correlated to brand strength, brand value building, and higher brand extendibility [22]. In addition, adding new products and services has a positive impact on brand reliability.

Brand reliability is an integrated part of brand trust and is described as the consumers' perception that purchasing a product or service under a specific brand carries the least pre and post-purchase risk [7]. Similarly, in another research it was described that brand reliability has a close and often indistinguishable connection with brand trust [21]. However, brand trust can be viewed as a stronger consumer emotion towards a brand.

Brand trust and brand reliability are positively correlated to brand referrals and brand commitment [27]. Further, it was discussed that strong brand credibility creates strong brand loyalty [15]. In the research conducted by Sung and Kim brand trust and brand reliability were analyzed as key factors for success in developing fruitful relationships with consumers [60]. It can be seen that brand credibility and brand reliability take part in brand loyalty development. Therefore, this study proposes that these two constructs should be analyzed as mediating constructs between brand awareness and brand loyalty. It is evident that these two constructs are part of branding as a whole. In order to adequately examine the influence of brand awareness on consumers' purchase intentions in this study, it is necessary to address other components of branding, which are in this case brand reliability, credibility and loyalty.

Brand loyalty and purchase intentions

Brand loyalty can be defined as the repetitive purchase of the same brand by consumers, disregarding other brands on the market [3]. Brand loyalty was also described as the attachment of consumers to a particular brand and it is one of main components of brand equity [2], [33].

In 2010, Lin noticed that consumers who are loyal to a specific brand, and often purchase products and services under the same brand, are less sensitive to the price of those products and services [47]. The complex research conducted by Back and Parks indicated that customer satisfaction was closely linked to brand loyalty and exhibited the relationship development process between consumer attitude and consumer behavior [4]. Brand loyalty has an immensely positive impact on business performance on a competitive market [43]. Improved business performance includes higher sales volume and lower risk of consumer dissipation towards other competitors [26]. It is noticeable that frequent and different forms of consumer-brand contacts create a good basis for enhancing brand loyalty [13]. Companies have to be aware that efficient brand management positively affects overall brand performance on the market [10].

Furthermore, this research argued that purchase intention could be described as the probability that a consumer will purchase a certain brand [12]. It represents the future decisions of consumers on the market regarding a given product or service. It was also noted that purchase intention was strongly affected by brand trust and brand commitment [34]. Therefore, these two dimensions can be used as factors for predicting future behavior of consumers.

Purchase intention is also highly influenced by consumer-brand relationships [32]. Purchase intentions can describe the decisions of consumers who want to establish a strong and meaningful relationship with a certain brand [19]. They are based on individual attitudes and unpredictable situations [44, p. 506]. Individual attitudes reflect personal wishes and needs of consumers, while unpredictable situations can be the price change or the new packaging of a product. Purchase intention is positively correlated to perceived value and perceived quality [39]. Consumer behavior and consumer intention should be analyzed separately, as consumer intention has stronger impact on business performance and competitiveness on the market [41].

Finally, in 2009 Berthon, Parent, Pitt, and Berthon analyzed luxury brands and consumers' intentions. They concluded that consumers focused on product value, product quality and, interestingly, emotional attachment [8]. It can be seen that there is large body of literature exploring this domain. However, there are fewer studies where brand awareness is analyzed in relation to customer's purchase intention and where brand reliability, brand credibility, and brand loyalty are observed as mediating constructs. The importance of purchase intention analysis lies in complex relationships that are developed on the market. Conducting trade (selling and buying of) in products and services on retail and wholesale levels is an imperative for a healthy economy, as value is created, sustained and transferred through trade on the market. Strong brands are bound to be bought, that is why they are strong. This way, brands bring additional value and they can indeed affect (enhance and disrupt) markets and the economy of a country. The term "national brand" is just a glimpse of how a brand can represent a region or a country and how it can affect economic prosperity.

Hypotheses development and research framework

Based on literature review and the goal of this study, the following null and alternative hypothesis are suggested:

H_0: The influence of brand awareness on consumers' purchase intentions is statistically insignificant.

H_a: Brand awareness positively influences consumers' purchase intentions.

The mediating constructs are observed through auxiliary hypotheses. Literature review provided sufficient insight in order to suggest the following:

H_1: Brand awareness positively influences brand reliability.

H_2: Brand awareness positively influences brand credibility.

H_3: Brand reliability positively influences brand loyalty.

H_4: Brand credibility positively influences brand loyalty.

H_5: Brand reliability positively influences consumers' purchase intentions.

H_6: Brand credibility positively influences consumers' purchase intentions.

H_7: Brand loyalty positively influences consumers' purchase intentions.

The research framework is shown in Figure 1 which depicts the observed marketing constructs and the auxiliary hypotheses.

Methodology

The research methodology included several important steps necessary to obtain credible data. The majority of the actions taken in the research process can be grouped in four main phases. The first phase included gathering literature and analyzing it in order to acquire sufficient theoretical background for the research.

In the second phase the survey was designed. It included 22 items in the form of seven-point Likert scales. The items were based on the previous research in the domain of brand loyalty, brand credibility, consumer behavior, and market factors [6], [14], [16], [50], [52], [55], [58], [62], [65].

Special attention was paid not to oversaturate the survey with unnecessary and repetitive questions. The brief nature of the survey minimized the influence of respondent fatigue. Furthermore, the survey was created in an electronic form, as an online survey, with four hundred eighteen participants (N=418). After excluding invalid surveys, a total of 410 completed surveys were used for further data processing.

The third phase started with exporting the data from Google Forms. Spreadsheets containing the obtained data were used to analyze the data sets. First, descriptive statistics were used to determine the mean and standard deviation values. Next, a reliability test was conducted with the aim of obtaining the Cronbach's alpha values. After that, the ordinal regression analysis and correlation analysis were conducted in order to analyze the potential relationships between the measured marketing constructs. Robust statistical methods were also applied in the form of multicollinearity and autocorrelation tests. Finally, a scatter plot was created to visualize the research data sets.

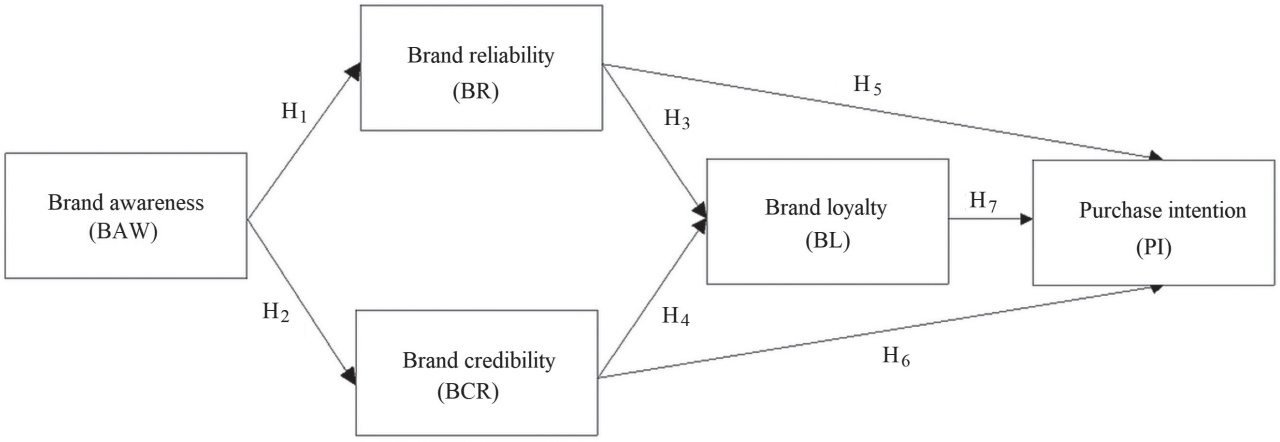
The fourth and final phase includes the discussion of the research results, as well as contribution and implications of the study. At the end, conclusions were drawn, limitations were outlined, and future research was suggested.

Results

The first data analysis tool was descriptive statistics. The results of descriptive statistics for every measured marketing construct are shown in Table 1. Descriptive statistics included the sample size, minimum and maximum values for every construct, the mean values, and the standard deviation.

Next, the reliability test showed that the Cronbach's alpha values were close to 1.0, which indicates high internal consistency between the survey items. The results of the reliability test are presented in Table 2.

Figure 1: Research framework



Source: The figure was developed for the purpose of this research.

Table 1: Results of descriptive statistics

Descriptive statistics				
Dimension/Construct	N	Min.	Max.	Mode
Brand awareness (BAW)	410	1	7	5.20
Brand reliability (BR)	410	1	7	5.75
Brand credibility (BCR)	410	1	7	5.33
Brand loyalty (BL)	410	1	7	5.86
Purchase intention (PI)	410	1	7	5.33

Source: Analysis conducted for the purpose of this research.

Table 2: Results of the reliability analysis

Reliability statistics		
Dimension/Construct	Cronbach's alpha	Number of items
Brand awareness (BAW)	0.956	5
Brand reliability (BR)	0.906	4
Brand credibility (BCR)	0.834	3
Brand loyalty (BL)	0.955	7
Purchase intention (PI)	0.861	3

Source: Analysis conducted for the purpose of this research.

For the purpose of the ordinal regression analysis, purchase intention (PI) is defined as a dependent variable. The independent variables are: brand awareness, brand reliability, brand credibility, and brand loyalty. The results of this analysis are presented in Table 3. The Wald chi-square values indicate that the variables should not be excluded from the regression model.

Table 3: Results of the ordinal regression analysis

Ordinal regression analysis							
Dep. variable	Indep. variable	Stand. coeff.	Pr > Chi^2	St. Error	Wald chi-square	Wald lower bound (95%)	Wald upper bound (95%)
PI	BAW	0.430	<0.0001	0.054	63.284	0.324	0.537
	BR	0.429	<0.0001	0.060	50.645	0.311	0.547
	BCR	0.361	<0.0001	0.059	36.556	0.244	0.478
	BL	0.295	<0.0001	0.058	25.71	0.181	0.408

Source: Analysis conducted for the purpose of this research.

Further, the pseudo regression values from the ordinal regression analysis are presented in Table 4.

Table 4: Results of the ordinal regression analysis

z	MSE	RMSE	R^2 (McFadden)	R^2 (Cox and Snell)	R^2 (Nagelkerke)
BR	1.013	1.006	0.113	0.451	0.454
BCR	1.116	1.057	0.104	0.424	0.427
BL	1.078	1.038	0.107	0.434	0.436

Source: Analysis conducted for the purpose of this research.

The McFadden's values are below 0.2 which would indicate an excellent fit; however, this does not disregard the validity of the model. Similarly, the Cox and Snell and the Nagelkerke values indicate that the model is a moderate fit. As a result of the regression analysis, the following regression model is proposed: $PI = \alpha 0 + \alpha 1 \cdot BAW + \alpha 2 \cdot BR + \alpha 3 \cdot BCR + \alpha 4 \cdot BL + \epsilon$. This regression model is important for future research.

After the regression analysis, the Spearman's correlation analysis was conducted, the results of which are shown in Table 5.

Table 5: Results of Spearman's correlation analysis

Correlation matrix					
	BAW	BR	BCR	BL	PI
BAW	1.000*				
BR	0.658*	1.000*			
BCR	0.639*	0.570*	1.000*		
BL	0.680*	0.736*	0.561*	1.000*	
PI	0.642*	0.654*	0.572*	0.621*	1.000*
*p<0.05					

Source: Analysis conducted for the purpose of this research.

According to Table 5, the correlation between the measured constructs is strong and positive. Brand reliability (BR) and brand loyalty (BL) have the highest correlation value (0.736). The lowest correlation value (0.561) is between brand credibility and brand loyalty. Brand awareness and purchase intention, as the two main constructs measured, are positively correlated, with the correlation value of 0.642. In addition to the Spearman's correlation analysis, multicollinearity statistics was employed. The results are presented in Table 6.

Table 6: Results of the multicollinearity statistics

Multicollinearity statistics					
	BAW	BR	BCR	BL	PI
Tolerance	0.397	0.374	0.528	0.380	0.466
Variance Inflation Factor (VIF)	2.52	2.067	1.894	2.633	2.145

Source: Analysis conducted for the purpose of this research.

The VIF values in Table 6 are below or slightly above 2.5, thus indicating nonexistent multicollinearity between the observed variables.

Discussion

Findings

This paper investigated the influence of brand awareness on consumers' purchase intentions and further discussed how this influence might affect markets and economic

development. The mediating constructs were brand reliability, brand credibility, and brand loyalty. The findings of this paper are complementary to other findings in this domain [17], [37], [49], [54]. The regression analysis has indicated that brand awareness and the mediating constructs (brand reliability, brand credibility, and brand loyalty) have a positive relationship with consumers' purchase intentions. Similar to other findings, the present study suggests that brand awareness is a dominant element in the process of creating purchase intentions [46]. It is interesting to note that brand awareness is likely to be positively influenced by advertising campaigns [18]. Does this mean that this study should have addressed advertising as well? Not necessarily, as this paper focuses on the brand-related constructs and their influence on consumers and the markets. The development of brands is similar to the development of products and services. Innovation, especially sustainable innovation, presents an imperative for long-term success on the market [57].

All of this further reflects on the overall economic prosperity of a country. The regression analysis has indicated a moderate positive relationship between the observed constructs. However, the p-values suggest that null hypothesis should be rejected. The correlation analysis has given satisfactory results as the correlation coefficients indicate a moderate positive correlation between the observed variables. For the correlation analysis, Spearman's correlation was used instead of the Pearson's correlation, as it is more appropriate for ordinal data [35]. Autocorrelation and multicollinearity are nonexistent between the observed data.

After a thorough data analysis, the question remains: Can we reject the null hypothesis? The answer is yes, because there are clear signs that brand awareness positively affects consumers' purchase intentions. Thus, the null hypothesis "H_0: The influence of brand awareness on consumers' purchase intentions is statistically insignificant." is rejected.

Furthermore, how is brand awareness affecting the markets and the economy? Branding and brand awareness play an important role in the business-to-business markets [37], [53]. Globalization affects the markets where changes are more frequent, which makes it challenging for companies to maintain a competitive position [23]. Also, it is important to note that the economic status of Serbia is complicated and public companies undergoing restructuring face difficulties, which results in the spillover effect on the rest of the economy [48]. Therefore, it can be assumed that brands are important for companies which want to compete on such turbulent markets.

A thorough analysis of literature in this domain and the findings of this research suggest that brand awareness positively affects brand loyalty, which further positively affects customers' purchase intentions. It can be proposed with a high level of certainty that consumer behavior determines the outcomes of business endeavors, thus indirectly affecting business performance. If this is viewed across multiple markets or all the existing markets in a country, it is safe to assume that consumer behavior forms the economic landscape as it shapes the business environment. Going back to brand awareness, if consumers are aware of a brand, there is higher probability that some of them will develop loyalty towards those brands. Further, through brand loyalty, the company behind the brand has a better chance of obtaining a stronger competitive position on the market, resulting in a stronger influence on the market. This opens doors to achieving regional competitiveness. The aforementioned hypothetically referred to only one brand. These changes on the market are more complex when there is a large number of brands competing with each other. This competitive behavior affects the economy. The degree to which it is affected and the period during which it is affected depend on numerous factors which should be investigated in the future.

Contribution and implications

Dynamic market environments create a tremendous need for new research of various marketing dimensions. The findings of this study provide a concise description of the relationships and causalities between the measured constructs. But is this study really significant? Although there are plenty of articles in this domain, the number of articles that focus only on brand-related constructs and purchase intentions is scarce. Therefore, taking into consideration the abovementioned observations, this research has certainly contributed to the existing literature

in the domain of brand awareness, consumer behavior and market factors.

Implications of this study are twofold. First, companies can obtain new insights into the importance of brands. The research provides details about the complexity of brand awareness, brand reliability, brand credibility, and brand loyalty. The results indicate that brand awareness and the other mediating constructs influence consumers' purchase intentions and that they can affect markets and economic development. Second, fellow researchers can use this paper when conducting their own studies in the domain of brand awareness, brand loyalty, brand reliability, brand credibility, consumers' purchase intentions, market factors and economic development.

Conclusion

This paper has discussed the influence of brand awareness on consumers' purchase intentions. Brand reliability, brand credibility, and brand loyalty were observed as mediating constructs. As stated in the discussion section, the data analysis gave results that are complementary to the suggested hypotheses. Thus, the null hypothesis is rejected as brand awareness positively affects consumers' purchase intentions. The data analysis approach that included ordinal regression analysis proved to be useful for a concise and thorough investigation of the impact of brand awareness on consumers' choices and potential implications it could have on the markets and economy. It is evident that brand awareness, as part of a brand as a whole, has the potential to affect not only consumers, but markets as well. As elaborated in the previous section, small changes on the market do not necessarily affect the economy, but high intensity and impactful changes surely can and will affect the economy in a positive or negative way. Further, it can be concluded that brands, consumers and consumer behavior are complex elements of the markets and the overall marketing environment. The importance of branding is indirectly highlighted, as it shows that a strong brand presence, that makes consumers aware of it, is a powerful "tool" that can help enterprises to achieve business excellence and better competitiveness.

The main limitation is the survey. Although questions include brands, there is no mention of either product categories or advertising campaigns in them. However, these limitations are not severe and advertising and product categories could create product and advertising bias.

For future research, brand love and customer satisfaction should be added as mediating constructs. This would give a more accurate view of how a brand as a whole affects potential consumers and customers.

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TRANSPORT SERVICES IN THE CREATION OF PACKAGE TOURS BY TOUR OPERATORS

Usluge transporta u kreiranju paket aranžmana od strane turoperatora

Abstract

Tour operators are the most important business systems in the international tourism market when it comes to vacations as a form of travel. The basic product of a tour operator is a package tour. Package tours connected by two or more different kinds of services are grouped into a single package of services which is sold at a unique price. Due to considerable competitive pressure in the tourism market, the competitiveness of the created package tours, as well as business success, depend directly on understanding the consumer expectations and preferences and on the degree of adaptability of the offered services. If consumer preferences are not understood and if the role of different services unified into package tours is not adequately perceived, the probability to sell those tours at a projected price is significantly reduced. When it comes to vacations, in more than 95% of cases transport services are part of the package tour. The way in which different forms of transport services are included in package tours, as well as the selected level of quality and characteristics of the chosen services, represent the key success factors for achieving competitive advantage on the market. The aim of this paper is to analyze the importance of different characteristics of transport services in package tours offered by tour operators using the AHP methodology. The analysis shall be carried out on a sample of around 400 participants in Serbia who used the package tour at least once in the last three years in order to determine the importance of different characteristics of transport services in package tours.

Keywords: *package tour, transport services, tour operators, AHP, product competitiveness.*

Sažetak

Turoperatori su najznačajniji poslovni sistemi na internacionalnom turističkom tržištu kada su u pitanju odmori kao oblik putovanja. Osnovni proizvod turoperatora su paket aranžmani. Paket aranžmani objedinjuju dve ili više različitih usluga u jedinstven paket usluga koji se prodaje po jedinstvenoj ceni. Izražen konkurentski pritisak na turističkom tržištu uticao je na to da konkurentnost kreiranih paket aranžmana, kao i poslovni uspeh, direktno zavisi od razumevanja, očekivanja i preferencija potrošača, kao i stepena prilagođenosti ponuđenih usluga. Ukoliko se ne razumeju preferencije potrošača i ako se na pravilan način sagleda uloga različitih usluga objedinjenih u paket aranžmane, u značajnoj meri je smanjena verovatnoća njihovog plasmana po projektovanoj ceni. Transportne usluge, kada su u pitanju odmori turista, u više od 95% slučajeva predstavljaju deo paket aranžmana. Način na koji će različiti oblici transportnih usluga biti uključeni u paket aranžmane, kao i odabrani nivo kvaliteta i karakteristike odabranih usluga, predstavljaju ključne faktore uspeha za ostvarivanje konkurentske prednost na tržištu. Cilj rada je da se na osnovu AHP analizira značaj različitih karakteristika transportnih usluga u paket aranžmanima turoperatora. Analiza će biti sprovedena na uzorku od oko 400 ispitanika u Srbiji koji su u poslednje tri godine minimalno jednom koristili paket aranžman, kako bi se utvrdio značaj različitih karakteristika transportnih usluga u paket aranžmanima.

Ključne reči: *paket aranžman, usluge transporta, turoperatori, AHP, konkurentnost proizvoda.*

Introduction

Tour operators are among the main actors in the tourism value chain. Their role is especially important when it comes to vacations as a form of tourism travels [13, pp. 403-412]. The origins of tour operators trace back to the period between the 1950s and 1960s, when air transport developed significantly. Expansion of air transport enabled the development of tourism in destinations far away from the source of demand, which significantly opened up the development perspective of tour operator business [8, p. 147]. Deriving from tourism agencies, tour operators widened their business activity to include organizing voyages instead of being classic intermediaries in the sale of tourism services. In modern conditions, tour operator business unifies different tourism services, thus creating complex products which are then distributed to the final users of those services [40, pp. 1-20]. Tour operators are companies which enter into negotiations with hotels, transport companies and other suppliers of tourism services in order to create package tours by combining the services they offer into tours and offering those tours as final products in the tourism market [41, pp. 349-365].

Tour operators are the most powerful and influential actors in the industry of organized vacations [5, pp. 23-53]. Their importance is primarily seen in the fact that they have the ability to direct the tourism demand towards certain destinations [39, pp. 298-314], as well as the ability to control the channels of distribution and connect different actors into a unified whole [26, pp. 65-77]. A particular proof of the stated is Europe, since during the last five decades tour operators have made the greatest contribution to the realization of international journeys in the form of vacations [26, pp. 65-77]. The European market was dominantly taken over by a few tour operators as the demand was characterized by uniformity and standardization, which resulted in very similar and mutually exchangeable package tours [5, pp. 23-53]. That gave rise to a strong competition among tour operators and led to the success of the destination where tourists spend their vacation and hotels located there, which is in direct correlation with the degree of their presence in package tours of big tour operators [5, pp. 23-53]. Based on the insight into the financial reports of TUI Group or Thomas Cook, the two biggest global tour operators, these companies annually provide services to more than 56 million passengers and achieve a total income of more than 30,000 million euros [53]. In Serbia, according to YUTA, the association gathering the greatest number of tour operators and tourism agencies, in 2018, 854,311 tourists traveling for the purpose of vacation opted for package tours, and more than 70% of those tours contained transport services. Globally, the number of passengers using tour operator services, as well as package tours, has increased by 2.1% annually over the last 10 years [52].

Currently, the tourism market is undergoing significant changes, affecting the characteristics of tour operator business. Namely, it has seen an increase in the number of low-cost airlines, the appearance and development of online tourism agencies (OTA), an increase in direct sales and in the number of independently organized journeys. All of that has led to a decline in the importance of the role of tour operators in the tourism market [4, pp. 150-161]. As market conditions have changed, tour operators are also forced to change and adapt their business policies, their price policy primarily, as well as marketing strategies in order to adapt them to tourist preferences [2, pp. 375-385]. In their study, Klemm and Parkinson have demonstrated that tour operators are shifting from mass and standardized package tours to placing individual and adjusted package tours on particular market segments. Also, tour operators have been given recommendations for the formulation of business policies whose aim would be establishing fruitful cooperation and partnership among tour operators in massive markets and tourist destinations [22, pp. 367-385]. Despite these recommendations, a certain number of tour operators tend to individually develop and promote their own brands with the aim of increasing their profit margin, not paying sufficient attention to and not placing enough emphasis on the development of destinations and accommodation capacities. On the other hand, the strategies of vertical integration of tour operators with tourist agencies, airlines and accommodation capacities have introduced them to completely new spheres of business.

That way tour operators have become stock owners or hotel owners and owners of other accommodation capacities in destinations where they do business, which is why there is an increased interest for their survival and further development [22, pp. 367-385].

Package tours offered by tour operators

According to one of the market models, tourism represents an object, and the connection between the country of origin and the tourist destination is the subject [28, pp. 367-384]. By establishing the connection between the country of origin and the destination, tourists are trying to find a way to satisfy their needs for travel and vacation. One of the ways to do that is to opt for a package tour offered by tour operators [28, pp. 367-384]. By integrating different tourism products into one tour operators play an important role of an intermediary in tourism activity. Tour operators are located between supply and demand in the tourism market and strive to maximize their business results by offering package tours [38, pp. 501-512]. The intermediary role of a tour operator in the tourism market is seen in the creation of a "dream" package. This role of theirs is best seen through the possibility to inspire and meet certain aspirations of the consumer by integrating different services into a package tour [38, pp. 501-512].

There are different definitions of package tours. A package tour consists of two or more service components sold as a package in the final market. From the point of view of the European market, package tours represent a predefined combination of accommodation, transport and/or other significant tourism services (Council Directive 90/314/EEC, 1990). The European market is characterized by a high degree of participation of package tours in the total volume of vacations as a form of tourism travel. At the beginning of the new millennium, tour operators are becoming key players in the vacation market due to successful integration of transport and accommodation capacities into package tours in a manner that significantly lowers their prices.

Scientific literature contains numerous studies whose aim is to identify the importance of individual components of the package tours for total tourist satisfaction [21, pp. 18-33]. The actors on the tourism supply side strive to offer tourists unforgettable, satisfactory, valuable experiences, thus creating value [33, pp. 343-354]. Tourism companies should create preconditions for gaining such experience, but the outcome is the direct consequence of the tourist's reaction in the process of obtaining the service [23, pp. 136-149]. Tourists see package tours as unique products and value this experience in a holistic manner, and not through particular services [47, pp. 98-110]. The majority of studies dealing with the analysis of the created value of the package tour are focused on surveys on tourist satisfaction with the package tour as a whole, and describe the relationship between the degree of tourist satisfaction and the grading of particular components as linear. On the other hand, a report published on behalf of the European Commission [36, pp. 172-194] has shown that, when one component of the value chain is inadequate, all actors shall probably suffer consequences, which derives from the fact that tourists evaluate a package tour as a whole. The findings of this study therefore support the claim that actors in the tourism value chain should work as a group, as a team, not individually [49, pp. 345-358].

There is also a different approach to the analysis of influence of the package tour on the creation of value in tourism. According to the Kano two-dimensional model, the quality attributes of package tours and satisfaction have a non-symmetrical and non-linear connection. The model shows that certain elements of the package tour can cause satisfaction, but their absence does not necessarily have to lead to dissatisfaction [3, pp. 93-102]. The Kano model defined in such a manner is supplemented by a few more studies, such as those from [50, p. 77].

The importance of the package tour in tourism development is considered vital since it lowers the price, creates a unique experience and improves its quality, thus improving the quality of the entire tourism industry [37, pp. 108-117]. The analyses indicate that the created value for tourists is significantly influenced by tourist guides which enable the execution of the services defined by package tours [18, pp. 305-315]. Besides the quality of particular service processes and the role of guide, tour operators are also partially responsible for the performance of their partners, including hotels and airlines, since they are the

ones choosing the services, integrating them into package tours and offering them to clients [37, pp. 108-117].

Transport services and package tours

Tourism and transport are mutually closely connected and tourism as a branch of economy could not survive without the developed transport infrastructure [42, pp. 1767-1777]. Practically, it is impossible to consider the tourism sector without transfer. A voyage, the idea about tourism products and the entire tourism experience begin and end with transport services [29, pp. 377-385]. The constitutive element of a great number of package tours is the service of transport. A great number of authors have analyzed the role of transport in tourist satisfaction when using package tours [5, pp. 23-59]. The characteristics of transport in the sense of "ease of reaching the destination" and the "accessibility of destination" have been defined as important attributes of transport services as regards their contribution to tourist satisfaction [6, pp. 220-229].

Transport is defined as a very important part of the tourism industry bearing in mind that it connects tourists with the tourist attractions and destinations. The development of transport, transport vehicles and an increase in using new technologies in transport services have definitely led to a speedy development of tourism and tour operator business [45, pp. 5631-5640]. The statistics of the World Tourism Organization shows a significant growth in the number of tourism travels between 2005 and 2018. According to the data of the World Tourism Organization (UNWTO), the number of foreign tourists in 2017 increased by 7% compared to the previous year, i.e., 1.3 billion tourists were registered, generating 1.340 billion dollars of income from tourism, which is an increase of 5% compared to the previous year [52]. It is estimated that by 2030 the number of international tourist arrivals will reach the level of 1.8 billion [52]. The trend can be explained by different factors; however, it is often pointed out that one of the key factors for the development of the transport sector is the usage of technological innovation in transport services [14, p. 19].

The means of transport in tourism are primarily used in order to provide the tourists with transport from their places of residence to their target destination. The development of electric and diesel engine has brought about radical changes in the domain of transport, while speed has become one of the most important factors. When opting for the means of transport, a tourist considers the following factors: the length of travel, distance, comfort, security, status, benefits, price, geographic position and competition. Among multiple determinants of attractiveness of a certain location from a touristic perspective, accessibility is usually one of the three key factors. Destinations with beautiful nature, cultural and historic monuments or sunny and sandy beaches will have difficulties becoming successful tourism destinations if the adequate transport service is lacking [28, pp. 367-387].

A study was carried out by analyzing the influence of different transport characteristics on the degree of tourist satisfaction [43, pp. 136-144]. The results of the study are very similar to the results of the empirical analysis carried out by Friman more than two decades ago [15, pp. 4-12]. The following elements were identified as the most important factors of tourist transport: simplicity in usage, efficiency and security, as well as parking in an appropriate location. Friman et al. broadened the analysis by dividing the first factor into two components: simplicity of obtaining transport information and assistance of employees offering the service. The second identified factor, efficiency and security, refers to the time and security dimension of public transport. The precision and length of travel are dimensions which represent the preconditions for the realization of reliable transport [9, pp. 10-14]. These two elements influence the degree of tourism satisfaction [17, pp. 499-517]. Security in travel has been identified as one of the key categories of public transport quality indicators for tourists. Although this factor was not identified by Friman et al., it was recognized as a strong factor influencing the perception of the destination and the package tour in the qualitative part of the survey carried out by Thompson [43, pp. 136-144]. The third important factor identified by Friman et al. refers to private as opposed to public transport. Good parking is necessary for both tourists renting a vehicle at the destination and tourists using their own means of transport when arriving in the destination. That is why

it did not appear in the previously conducted research of tourist satisfaction with public transport.

The results of several studies have indicated the availability of the destination and the performance of the means of transport as the most important attributes necessary for total tourist satisfaction. Pritchard and Havitz have concluded that, in the case of Western Australia, tourists have recognized transport as the second most important factor in the total tourist product [34, pp. 25-46].

Transport has a significant role in the improvement of tourist experience. Its role goes beyond the scope of simple passenger transport from one point to another. Thus, transport has become an independent element of the tourist offer and can become an attraction in itself. As such, transport is used to realize sea and river cruises, followed by thematic voyages by train, such as Orient Express, etc. [29, pp. 3777-385]. One of the important factors in making a decision about the type of transport is fun. The study carried out by Gronau and Kagermeier, based on the survey of 2000 households, pointed out two main categories of transport: fun and functionality [16, pp. 123-135]. Based on the obtained answers, seven different groups of people were identified. One of the groups comprises the so-called "calm bon viveurs" who place a great emphasis on the category of fun in transport.

Based on all the results of the previously mentioned studies carried out in the past two decades, it can be concluded with certainty that transport has a significant place in creating value and tourist satisfaction with the package tour while, on the other hand, there is no scientific consensus as to what are the key transport characteristics which greatly influence tourist satisfaction.

The aim of the present empirical research

The idea of the present empirical research is to determine the importance of the transport service for tourists traveling to summer holiday destinations. The analysis focuses on tourists who opt for package tours as a form of product for their summer holiday. The starting point of the analysis were the explained facts that transport is important because it enables reaching the tourist destination [15, pp. 4-12], but also the fact that it is an element that contributes to the attractiveness of the journey [29, pp. 377-385]. Based on literature review, several different characteristics of transport services have been identified as important for the analysis of tourist satisfaction and the competitiveness of a package tour as the basic product of a tour operator. The analyzed factors are shown in Table 1.

The present empirical research has been carried out through three connected iterations. During the first iteration the importance of different characteristics of transport services in the package tour was graded using the AHP model. The second research iteration referred to determining different segments of tourists who opt for package tours based on the grade of importance of different characteristics of transport services during travel. The process of segmentation was not analyzed employing the traditional approach, but rather it started with the assumption that different factors of attractiveness do not have the same importance for tourists who have different preferences, which is why a cluster analysis was used to identify different segments. The third iteration contained the analysis of the efficiency of segmentation based on grading the importance of different characteristics of transport services and the traditional approach to

Table 1: Different characteristics of transport services used by tourists traveling for the purpose of vacation

Research authors	Type of service	Elements of analysis
Bradlei et al., (1989) [9, pp. 10-14]; Friman et al. (1998) [15, pp. 4-12]	Transport service in general	Minimum time needed to reach the destination
Fitzsimmons et al., (2006) [14, p. 122]		Minimum effort during travel
Sorupia, (2005) [42, pp. 1767-1777]		The comfort of transport vehicles
Hensher et al., (2003) [17, pp. 499-517]	Attractiveness of locations that can be visited over the course of transport	Visiting generally known attractions on the way to the destination
Kagermeier (2007) [16, pp. 127-135]		The possibility of shopping and visiting points of interest during the journey
Pritchard et al., (2006) [34, pp. 25-46]		Stops at interesting places

segmentation. One-way ANOVA method was used for testing the efficiency of different criteria of segmentation.

AHP methodology

AHP (Analytic Hierarchy Process) is a complex mathematical model developed more than 30 years ago. The model is based on the so-called fuzzy logic. AHP model starts from the assumption that different elements bear different importance for respondents and by comparing the importance of different elements the grades of relative importance of every element can be obtained. In tourism, the AHP methodology has been applied in a great number of research studies and obtained results have a significant theoretical contribution. In his paper from 2011, Cruch determined the relative importance of different attributes of competitiveness for total competitiveness of the tourism destination. Some other important research papers where AHP methodology was implemented refer to: evaluation of natural attraction of a tourist destination [17, pp. 499–517], selection of a convention site and hotel location [11, pp. 18–33], online personalized attraction recommendation system [18, pp. 305–315], and tourist destination preference evaluation.

Fuzzy AHP is used for grading by performing a pairwise comparison of elements being graded. The fuzzy AHP methodology uses triangular fuzzy numbers based on which final grades of every graded element are calculated. The respondents compare the importance of two alternatives when grading. The importance is determined based on personal grades of every respondent in the following manner: respondents assign more importance to one alternative than to the other and specify the extent to which such alternative is more important. Based on the grades, fuzzy numbers are formed. Fuzzy numbers represent a standard fuzzy set of real numbers which belong to a limited interval.

In this empirical research, respondents compared elements on a five-grade Saaty's scale and determined to which extent one alternative has greater importance compared to the other.

The example of obtaining fuzzy numbers and triangular fuzzy numbers is shown in Table 2.

Based on the obtained grades, a fuzzy comparison matrix is formed using the triangular fuzzy numbers for every respondent. Normalization of the comparison matrix results in an inverse matrix, based on which the grades about the relative importance of every element graded by respondents are obtained.

In order for the grades to be valid when implementing the fuzzy AHP methodology, it is important to test the consistency in respondents' grades. Since comparison is a matter of respondents' personal estimates, they often give inconsistent answers based on which relevant conclusions cannot be drawn. Testing the consistency means determining whether respondents have been truthful in their answers or not [30, pp. 4793–4805]. The consistency is calculated based on the fuzzy comparison matrix. In order to test the consistency, the analysis uses the Saaty's consistency ratio (CR). This ratio indicates whether the respondents' grades have been consistent or not [35, p. 28]. Saaty states that the requirement of 10% cannot be reduced to 1% or 0.1% without trivializing the impact of inconsistency.

The results obtained by implementing the AHP model were then tested by a dual hierarchy analysis in order to determine whether there were differences in the preferences of different elements of value and whether based on those differences different tourist segments could be formed. Afterward, the efficiency of different segmentation criteria was tested based on the ANOVA test.

In order to obtain the necessary results to form the matrix, it is necessary to create a diagram of hierarchy (Figure 1). The hierarchy diagram presents the overview of

Table 2: The manner of obtaining fuzzy numbers on a five-grade Saaty's scale [11, pp. 353–370]

Oral answers about the comparison of the importance of two elements	Fuzzy number	Triangular fuzzy number in martini (l, m, u)
Equal importance	1	(1/3, 1, 3)
Little importance	3	(1, 3, 5)
Strong importance	5	(3, 5, 7)
Very strong importance	7	(5, 7, 9)
Extreme importance	9	(7, 9, 9)

different characteristics of transport services in a manner which clearly depicts their systematization and relations. In order to formulate the diagram of hierarchy shown in Figure 1, the starting point were the most important characteristics of transport services which are important for tourists who opt for package tours offered by tour operators when traveling.

The research sample

The research was conducted on a sample of 50 respondents in the Republic of Serbia. The criterion for the selection of respondents was their experience in using the package tour in the previous three years. It was important for the respondents to meet the necessary criteria so that they would be able to grade the importance of different characteristics of transport services. The research used stratified sampling. The total urban population of Serbia was divided into four stratums according to the geographical criterion. For each of the stratums a minimum number of respondents needed for the sample to be representative was determined according to the following criteria: (1) age, (2) personal monthly income, and (3) education. Respondents were chosen randomly from two cities from each geographical region.

The survey was carried out by telephone, randomly choosing landline phone numbers from the databases of Telekom Serbia. Respondents gave answers to questions which were based on the demographic characteristics defined as the criteria of segmentation (gender, age, personal income and degree of education) and whose aim was to reveal their experience regarding travel. On average, every twentieth contact was suitable for survey. The reasons for not being suitable were the following: (1) not answering the phone, (2) refusing to participate in the survey; (3) not being eligible according to the criteria of experience in travel and (4) not fitting in the needed demographic profile (for example, at the final stage of the survey, only respondents who did not finish high school were required).

Discussion of the obtained results

The processing of data included analyzing the answers of every individual respondent. The consistency ratio was generated for every comparison made by respondents.

Figure 1: The hierarchy diagram of value elements in travel decision-making

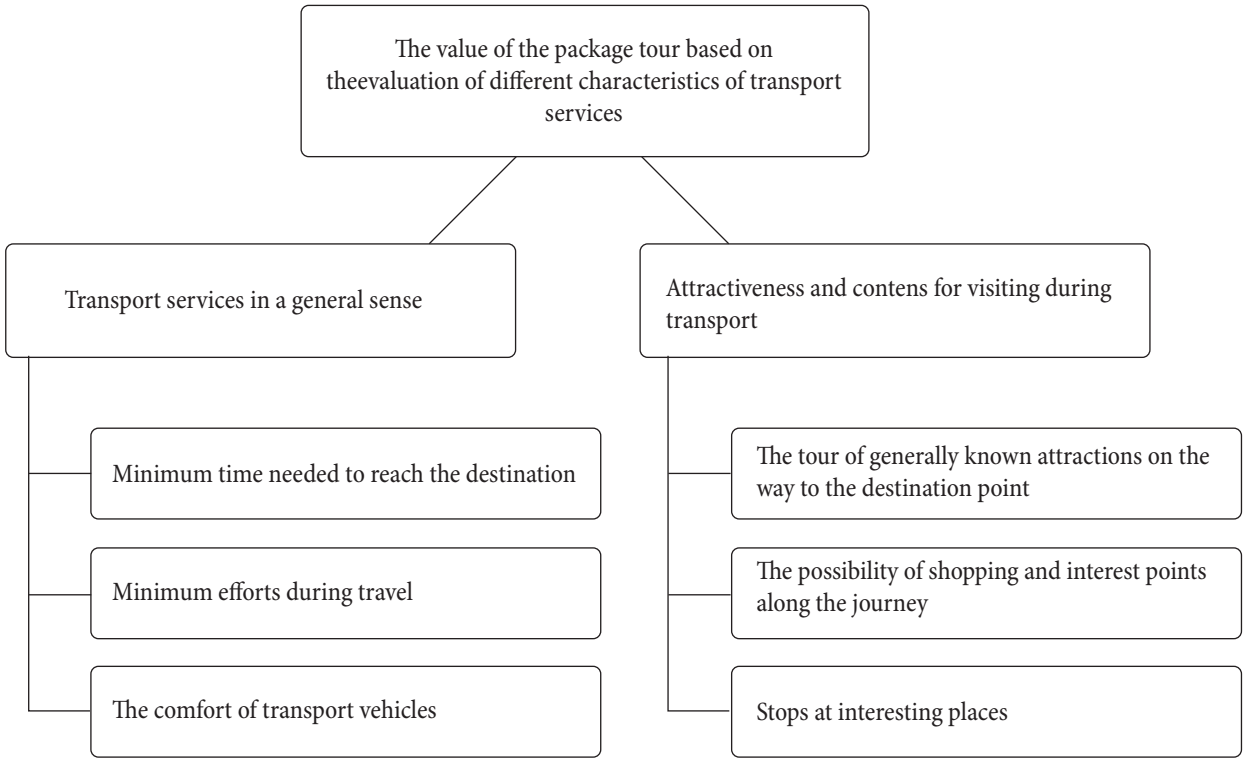

Table 3: The grade of importance of different characteristics of transport services in the package tour

	Level 1 (variables)	Grade	Level 2 (variables)	Grade	Rank
The value of the package tour based on the evaluation of different characteristics of transport services	Transport service in general	0.61	Minimum time needed to reach the destination	0.14	5
			Minimum effort during travel	0.20	2
			The comfort of transport vehicles	0.22	1
	Attractiveness of locations that can be visited over the course of transport	0.39	Visiting generally known attractions on the way to the destination	0.17	4
			The possibility of shopping and visiting points of interest during the journey	0.09	6
			Stops at interesting places	0.18	3

C. I. = 0.094, C. R. = 0.016, C. I. = 0.0089, C.R. =0.011, C.I. =0.041, C.R. = 0.012, C. I. = 0.043, C. R. = 0.032.

Every comparison with the consistency ratio greater than 0.05 (R > 0.05) was rejected as inconsistent. The respondents who had one or more inconsistent comparisons and whose consistency ratio was greater than 0.05 were not further analyzed and were, thus, excluded from the final conclusion. It was determined that there were 173 inconsistent answers given by 121 respondents. The analyses did not include respondents whose all answers were consistent, 729 respondents in total.

The research carried out implementing the AHP methodology yielded the results shown in Table 3.

Based on the obtained results it can be noted that tourist who travel to summer holiday destinations find the transport service in general (grade 0.61) more important than the attractiveness of locations that can be visited over the course of transport between two destinations (grade 0.39). The most important characteristic of a transport service is the comfort of the transport vehicle, while the least important characteristic is the possibility of shopping and visiting points of interest during the journey in order to make it as interesting as possible.

In order to analyze the degree of demand heterogeneity, a cluster analysis was performed, while a double cluster analysis was conducted to determine segments. The double cluster analysis includes two phases of clustering: (1) a priori clustering, based on which the respondents are grouped into sub-clusters and (2) hierarchical clustering, which includes observation of all clusters as individual cases and selection of the most efficient clustering based on which segments are defined. Log-likelihood was used as a distance measure, while the clustering criterion was the Schwarz-Bayesian criterion. Such an approach to clustering is recommended for samples bigger than 500 with the analysis employing continuous variables which is the case with the results obtained in the present research.

Based on the analysis, three independent segments were identified. The size of every segment is represented in Table 4.

Table 4: The size of segments obtained by cluster analysis

	N=	%
Segment 1	470	40.1%
Segment 2	259	59.9%

Based on Table 4, it can be noted that every segment includes over 40% of the population which indicates that the segments are big enough for a more detailed analysis to be justified.

Table 5 shows the grades for every characteristic of a transport service in package tours in both defined segments. Based on the grades, ranks for both segments were determined.

Table 5: Grades for every characteristic of a transport service in package tours in both defined segments

Level 2 (variable)	Grade - Segment 1	Rank - Segment 1	Grade - Segment 2	Rank - Segment 2
Minimum time needed to reach the destination	0.13	5	0.18	3
Minimum effort during travel	0.14	4	0.19	2
The comfort of transport vehicles	0.16	3	0.23	1
Visiting generally known attractions on the way to the destination	0.21	2	0.14	4
The possibility of shopping and visiting points of interest during the journey	0.16	3	0.12	5
Stops at interesting places	0.20	1	0.14	4

The obtained results show that tourists who belong to segment 1, which is somewhat smaller (40.1% of the total population) compared to the other segment, find the possibility of shopping and visiting points of interest during the journey somewhat more important. When it comes to transport services as part of the package tour, this segment of tourists mostly prefers visiting generally known attractions on the way to the destination, followed by stops at interesting places. This segment of tourists also finds the possibility of shopping and visiting points of interest during the journey interesting. They find the transport service in general, e.g., minimum time needed to reach the destination and minimum effort during travel, less important. The most important item for this segment regarding transport services in general is the comfort of transport vehicles. Thus, this segment can be characterized as tourists whose travel adventure begins at the moment they enter the vehicle in their place of residence.

As regards tourists who belong to segment 2, which is greater (50.9% of the total population) compared to the first one, the obtained results show that they find the transport service in general somewhat more important as a characteristic. When it comes to transport services as part of the package tour, this segment of tourists mostly prefers the comfort of transport vehicles, minimum efforts during travel and minimum time needed to reach the destination. This segment finds visiting generally known attractions on the way to the destination, stops at interesting places and the possibility of shopping and visiting points of interest during the journey less important. Thus, this group can be characterized as tourists whose travel adventure begins only when they reach the tourist destination; they regard transport services only as a necessary element, without taking potentially interesting elements of the very transport into consideration.

In order to determine whether the segmentation of the tourism market based on different preferences of the users of transport services within package tours is different compared to the segmentation based on traditional criteria (gender, age, education, monthly income), the following hypothesis was tested during the course of this research:

H_o. There is a greater degree of difference between segments classified according to preferences of different characteristics of transport services within package tours compared to segments of tourists classified according to traditional criteria.

H_1. There is a lesser degree of difference between segments classified according to preferences of different characteristics of transport services within package tours compared to segments of tourists classified according to traditional criteria.

The starting assumption was that if the test results show that: (1) the similarity in grades within segments (the homogeneity within the segment) is greater, and (2) the grade difference between different segments was greater (the heterogeneity between segments) in case of the segmentation based on different preferences when it comes to the characteristics of transport services within package tours compared to the segmentation based on traditional criteria, the hypothesis H_1 can be accepted and H_0 rejected.

In order to test the significance of difference, one-way ANOVA was used. The differences in grades between two or more independent populations were analyzed. ANOVA was employed for the purpose of calculating the two levels of variance distribution of the basic population: (1) variance between samples and (2) variance within the sample.

ANOVA resulted in producing the F-statistics. In the center of analysis was the central limit theorem and it provided an F quotient for every variable, which is used to measure homogeneity within the segments and heterogeneity between the segments. If the difference between the grades within the segment is smaller (a higher degree of homogeneity within the segment) and if the difference in grades between segments is greater, the value of the F quotient is higher and vice versa. Besides the F quotient, the analysis also determines the statistical significance of difference calculated as Sig. If the Sig. value is between 0.05 and 0.01, it can be said with more than 95% of certainty that there are statistically significant differences between the subgroups of the categorical variable (the segment, gender, years, segments obtained by cluster analysis, etc.) and that these differences obtained through analysis of a sample of respondents really exist in a population represented by the sample. If the Sig. value is

greater than 0.05 due to insufficient statistical reliability, it can be stated that there is an absence of statistically significant differences between the subgroups of the categorical variables.

The hypothesis was tested using ANOVA with the help of the SPSS software. The difference between segments grouped on the basis of traditional criteria of segmentation and segments classified according to preferences of the characteristics of transport services within package tours was analyzed. The results are presented in Table 6.

Based on Table 6, it can be concluded that the statistically significant difference between segments obtained on the basis of preferences of characteristics of transport services within package tours compared to segments obtained by implementing the traditional criteria of segmentation - gender, age income, geographic location, education, which means that the H_1 hypothesis is accepted.

The conclusion on the acceptance of H_1, based on the results presented in Table 6, can be drawn from the fact that there is a statistically significant difference for all 6 variables included in the analysis, in case of segments based on preferences of different value elements. In case of segments obtained based on other criteria, there are fewer variables for which there is a statistically significant difference: (1) gender – 0; (2) age – 3; (3) personal income – 2; (4) income per member of household – 2; (5) geographic location – 0; and (6) education – 2. Based on all stated facts, H_1 can be accepted and it can be concluded that the segmentation based on the importance of different attractiveness factors in the process of decision-making is more efficient compared to the usage of traditional criteria.

Concluding remarks

The research carried out employing the AHP method clearly indicates that the process of market segmentation of users of tour operator services needs to be based on the importance of different characteristics of services which are a part of the package tour. The analysis according to preferences and the market needs segmented based on it yield better results than analysis according to the traditional criteria of segmentation (gender, age, etc.). Tourists traveling for the purpose of vacation who opt for package tours of tour operators have different preferences regarding the characteristics of transport services. When analyzing the significance of particular characteristics of transport services, tour operators need to start from two segments. The second segment attaches more importance to the speed of arrival to the tourist destination and the comfort of the transport vehicle. The emphasis on these services in the package tour enables tour operators to achieve competitive advantage within this segment of tourists. The first segment considers visiting generally known attractions on the way to the destination, stops at interesting places and the possibility of shopping and visiting points of interest during the journey more important compared to the speed of arriving to the destination. Both segments care about the comfort of transport vehicles. The

Table 6: ANOVA - F statistics

	Segments according to the preferences		Gender		Age		Personal income		Income per member of household		Geographic Location		Education	
	F	Sig.	F	Sig.	F	Sig.	F	Sig.	F	Sig.	F	Sig.	F	Sig.
Transport service in general	2266.5	0.00	0.2	0.65	2.1	0.06	1.0	0.40	2.4	0.05	0.4	0.72	1.6	0.19
Attractiveness of locations that can be visited over the course of transport	2266.5	0.00	0.2	0.65	2.1	0.06	1.0	0.40	2.4	0.05	0.4	0.72	1.6	0.19
Minimum time needed to reach the destination	258.0	0.00	0.0	0.88	0.4	0.86	1.0	0.39	1.5	0.20	1.3	0.28	1.5	0.20
Minimum effort during travel	525.1	0.00	1.2	0.28	1.8	0.12	0.7	0.62	2.7	0.03	1.4	0.24	0.5	0.70
The comfort of transport vehicles	683.6	0.00	0.0	0.93	1.6	0.15	2.3	0.06	3.2	0.01	0.5	0.66	2.1	0.11
Visiting generally known attractions on the way to the destination	524.6	0.00	0.6	0.45	3.1	0.01	3.3	0.01	1.7	0.15	0.1	0.96	4.9	0.00
The possibility of shopping and visiting points of interest during the journey	242.1	0.00	0.1	0.72	3.0	0.01	2.3	0.06	0.5	0.73	1.0	0.41	4.4	0.00
Stops at interesting places	569.0	0.00	0.2	0.70	3.7	0.00	0.3	0.90	2.4	0.05	0.4	0.73	0.2	0.87

two specified segments can represent a starting point for the definition of characteristics of transport services within package tours. Tourist preferences can be analyzed in more detail within each segment, after which an adequate offer of the package tour for the summer holiday destinations can be defined. Since competitive pressure on the market is building up, tour operators have to search for the factors which will secure them competitive advantage. Transport services contained in the majority of package tours can represent a significant factor of achieving competitive advantage.

Although the issues of management and business policies of tour operators are not part of this research, they must not be forgotten. By creating adequate package tours with the right choice of transport services, the managers might partially alleviate the main challenges they are faced with in business, such as strong seasonal concentration, the issue of unused capacities out of season and the issue of demand fluctuation.

This research has several limitations which can be summed up in the following manner: (1) only tourists traveling to summer holiday destinations for vacation have been researched, which is why the conclusions cannot be generalized to all types of package tours (for example, travels to winter destinations, city tours, etc.); (2) the analysis focused on tourists from Serbia, which is why its results cannot be applied to all tourists, although the conclusions are certainly relevant for tour operators which do business on the Serbian market; and (3) the research did not encompass the price of travel which can make the importance of particular characteristics of transport services relative to a large extent, if their inclusion would lead to a rise in the prices of package tours.

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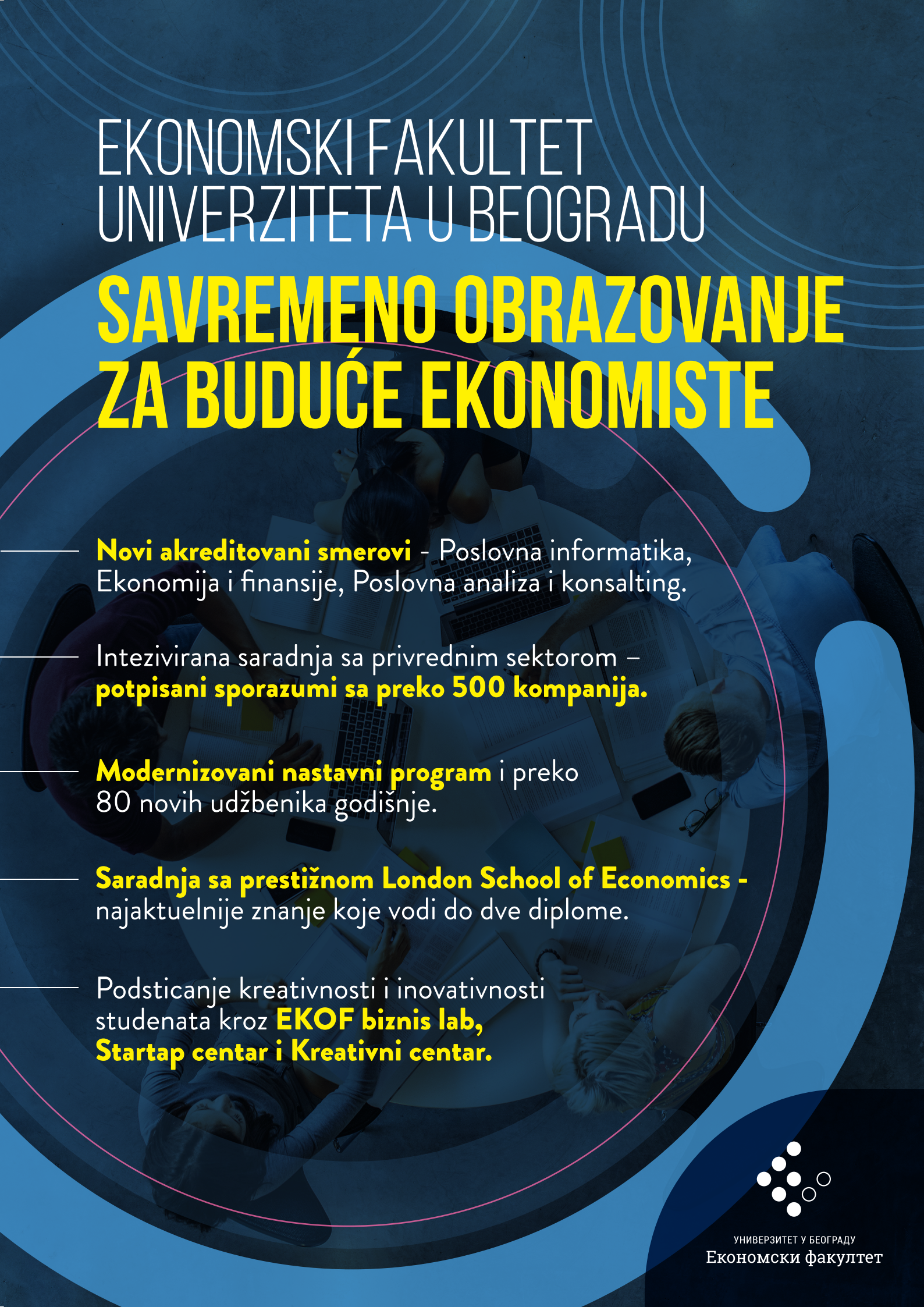

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