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The influence of national culture on the compensation system in selected countries

Утицај националне културе на систем компензација у одабраним земљама

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Abstract: The escalating pace of globalization affects the increased need of organizations to develop effective compensation programs. Business cannot be imagined without one of the key things and that is human resources. Creative and productive employees are of great importance for the success of any organization. For the satisfaction and loyalty of employees, the compensation system, which consists of basic pay, incentive pay, and benefits, is of key importance. The goal of the compensation system is to simultaneously ensure the main goals of employees and employers, i.e. the purchasing power and satisfaction of employees, as well as the business success of the company. In times of crisis, determining the amount of basic pay, selecting adequate incentives, and offering various benefits became especially important. The aim of this paper is to present the basic elements of the compensation system in twenty countries around the world and to analyze the impact of national culture on the compensation system. The paper will present the following dimensions of national culture according to Hofstede's classification: distance from power, individualism versus collectivism, male versus female cultures, avoidance of uncertainty, long-term versus short-term orientation, compliant versus restrained cultures. The analysis included twenty countries around the world, which are grouped as follows: the first 8 countries are members of the EU, the other 6 countries are located in the CEE region and the last 6 countries represent very important countries around the world. The paper determines the influence of the dimensions of national culture on the compensation system in selected countries from the European Union, the region of Central and Eastern Europe, and other countries, the paper is the basis for further research in this area.
Keywords: compensations, basic pay, incentives, benefits, national culture.
JEL classification: J31, J33

Сажетак: Ескалирајући темпо глобализације утиче на повећану потребу организација да развију ефикасне програме надокнаде. Пословање се не може замислити без једног од кључних ствари а то су управо људски ресурси. Од великог значаја за успех сваке организације су креативни и продуктивни запослени. За задовољство и оданост запослених од кључне важности представља систем компензација, који се састоји од основне зараде, стимулативне зараде и бенефиције. Циљ система компензације је да истовремено осигурава главне циљеве запослених и послодаваца, односно куповну моћ и задовољство запослених, као и пословни успех компаније. У периодима кризе, утврђивање висине основне зараде, одабир адекватне стимулације и понуда разних бенефиција добија посебан значај. Циљ рада је да представи основне елемената система компензација у двадесет земаља широм света и извршити анализу утицаја националне културе на систем компензација. У раду ће бити приказане следеће димензије националне културе по Хофстеде-овој класификацији: удаљеност од моћи, индивидуализам насупрот колективизму, мушке насупрот женским културама, избегавање неизвесности, дугорочна насупрот краткорочној оријентацији, попустљиве насупрот уздржаним културама. У анализу је укључено двадесет земаља широм света, које су груписани на следећи начин: првих 8 земаља су чланице ЕУ, других 6 земаља су чланице ЦЕЕ и последњих 6 земаља представљају веома значајне земље широм

света. У раду је утврђен утицај димензија националне културе на систем компензација у одабраним земаљама из Европске уније, из региона Централно-источне Европе и осталих земаља, рад представља основу за даља истраживања из ове области.
Кључне речи: компензације, основна зарада, стимулације, бенефиције, национална култура.
ЈЕЛ класификација: J31, J33

Introduction

Human resource management (HRM) is about taking care of people. DeCenzo & Robbins (2002) state that human resource management is responsible for the human dimension of an organization. Human resource management consists of staffing, development, motivation as well as staff retention. Dessler (2002) points out that modern management puts in the first place the importance of employees as well as the importance of psychological factors such as abilities, motives, goals, expectations etc. He also states that HRM refers to practices and policies necessary to perform managerial tasks relating to personal matters and, in particular, to the recruitment, training, evaluation, and rewarding of employees. Human resource management (HRM) implies the current or previous result or performance of employees, teams, or the entire organization (Slavić et al., 2014).

International Human Resource Management (IHRM) has multiple meanings and definitions by different authors. For instance, according to Taylor et al. (1996), IHRM is a set of different activities, processes, and functions aimed at attracting, developing, and maintaining the human resources of multinational corporations. According to Almond et al., (2004) IHRM deals with identifying and understanding how multinational organizations manage their employees located in different countries around the world to harness human resources in order to achieve local and global competitive advantages. Internationally oriented companies are forced to develop new policies and standards related to employment, training, coaching, and the reward system. It is necessary to continuously harmonize with national legislation, economic and social realities and cultural differences. In relation to national human resource management, IHRM requires a broader view and includes a wider range of activities such as selection, verification of professional competence, obtaining a work permit in foreign countries, cross-cultural adaptation program, helping a couple find a job, etc. (Maksimović, 2014).

Štangl Šusnjar & Leković (2009) define compensations as a direct financial cost for each company and emphasize that labour costs represent the importance of monetary amounts of total operating costs. In some industries, labour costs can reach as much as 60% of total operating costs. For this reason, companies should view this cost as an investment that will result in increased company value.

Factors that influence systemic compensation can be external (economic pressures, government policy, and laws, stakeholders, culture, and customs) or organizational (strategic organization, technology, human capital, human resource policies, acceptance, and employee attitudes - fairness and costs), as it is stated by Štangl Šušnjar, Slavić and Berber (2017).

National culture is an important factor in the compensation system. The most commonly used classification of national cultures is based on Hofstede's research, which distinguishes several main dimensions. The aim of this paper is to present the basic elements of the compensation system in twenty countries around the world and to analyse the impact of the dimensions of national culture on the compensation system.

The paper is structured as follows: the first part contains an overview of the structure of the remuneration system, with special emphasis on the managers' compensation system, compensation management goals, and emphasis on the importance of the remuneration system to employees (their motivation, satisfaction, commitment, etc.). The second part refers to the presentation of the dimensions of national culture according to Hofstede's classification, as well as the tabular presentation of the dimensions of 20 countries around the world. In the third part, the practice of compensation for 20 countries is presented, of which 8 are EU member states, 6 CEE (Central and Eastern European) countries, and 6 countries around the world (Russia, USA, Japan, Switzerland, India, and the UK). This is followed by the fourth part, comprising the analysis of the influence of national culture on the compensation system in selected countries. The paper concludes with conclusions and recommendations for future research.

1. Theoretical background

Different authors define the compensation system in different ways. Fay & Thompson (2001) point out that compensations represent a systemic approach to providing monetary value as well as other benefits to employees in exchange for their work or service and that compensation plays a significant role in attracting high-potential employees as well as retaining existing employees. They also emphasize that the compensation of employees has a great impact on the motivation of all employees to achieve a higher level of performance.

Compensation consists of the basic pay with allowances in the form of various incentives designed at the individual or group organizational level as well as compensation related to tangible and intangible elements for employees (Berber et al., 2017). In this paper, the compensation system is observed so that its main elements are the basic pay with various allowances, incentive pay, which is formed at the individual, group, or organizational level, as well as benefits related to tangible and intangible benefits to workers.

Rewarding employees is considered to be the most complex and sensitive function of human resources management. Through compensation, it influences the motivation of employees to behave and work in a way that affects the achievement of the organization's goals. Based on the observation of the stated goals of the company and employees (expatriates), we conclude that it is very difficult to achieve all goals at the same time and that it is necessary to continuously adjust and balance goals to achieve the strategic goal of the company – survival, maintaining high-level international operations, and growth and development in the long run. In the following section of the paper, the elements of the compensation system will be tabulated (Lowe et al., 2002).

Table 1: Elements of the compensation system

Basic pay	It represents the minimum level of earnings; in some cases, it represents the standard earnings while in others it is supplemented with other elements of earnings.
Incentive pay	It refers to rewarding the above-average performance of workers. Companies can use various methods of individual, group, and organizational stimulation. Stimulation of individuals usually refers to payment per unit of product, rewarding innovation, stimulating time savings, and individual bonuses. Group stimulation takes into account the performance of the whole group rather than individual members. Incentives at the organizational level reward all employees for the achieved performance of the organization.
Benefits	They represent an indirect part of the compensation system. They refer to benefits above basic and incentive pays. They mainly include unemployment insurance, health and pension insurance, company car, food, babysitting, status, paid transportation costs, counselling services, etc.

Source: the author, based on Štangl Šušnjar et al. (2017)

2. Overview of the dimensions of national culture according to Hofstede's classification.

Compensation professionals in multinational companies need to know the elements of national cultures and their impact on compensation. National culture encompasses common norms, attitudes, and beliefs of individuals within national borders. Hofstede's framework represents the most commonly used national cultural framework in studies such as psychology, sociology, management, or marketing (Soares et al., 2007).

Hofstede used 116,000 questionnaires and over 60,000 respondents in 70 countries in his empirical study (Hofstede, 1984, 1991, 2001, 2005).

Table 2: Overview of the dimensions of national cultures according to Hofstede's classification

Dimension	Description
Power distance	The extent to which society accepts the fact that power in institutions and organizations is not evenly distributed.
Uncertainty avoidance	The degree to which members of society feel uncomfortable due to uncertainty, ambiguity, something that is far from the status quo.
Individualism/ collectivism	The degree to which members of society are integrated into groups.
Masculinity/femininity	The degree to which members of society strive for achievements, material rewards, and success, or prefer cooperation, social care, modesty, and quality of life.
Long-term/short-term orientation	The degree of inclination that a society has in either short-term fulfilment of social obligations or long-term orientation towards the future, persistence, and thrift.
Indulgence/Restraint	The degree to which members of a society are free to satisfy their basic needs or the following strict social norms.

Source: the author, based on Hofstede & Minkov (2010); Andrijauskienė & Dumčiuvienė (2017).

The following is a tabular presentation of Hofstede's cultural dimensions for selected countries to further analyse the impact of national culture on the compensation system.

Table 3: Overview of the dimensions of the national culture of 20 countries according to Hofstede's classification

	Country	Power distance	Individualism	Masculinity	Uncertainty avoidance	Long term orientation	Indulgence
EU member states	Germany	35	67	66	65	83	40
	France	68	71	43	86	63	48
	Italy	50	76	70	75	61	30
	Sweden	31	71	5	29	53	78
	Greece	60	35	57	100	45	50
	Denmark	18	74	16	23	35	70
	Belgium	65	75	54	94	82	57
	Netherlands	38	80	14	53	67	68
CEE region states	Serbia	86	25	43	92	52	28
	Hungary	46	80	88	82	58	31
	Slovakia	100	52	100	51	77	28
	Slovenia	71	27	19	88	49	48
	Czech Republic	57	58	57	74	70	29
	Bulgaria	70	30	40	85	69	16
Other countries	Russia	93	39	36	95	81	20
	SAD	40	91	62	46	26	68
	Japan	54	46	95	92	88	42
	Switzerland	34	68	70	58	74	66
	India	77	48	56	40	51	26
	UK	35	89	66	35	51	69

Source: Author based on: https://www.hofstede-insights.com/product/compare-countries/

3. Overview of compensation systems in selected countries

"One of the most important factors in every company's business comes out the door every day." People and human resource management are increasingly seen as a key element of competitive advantage (Pfeffer & Jeffrey, 1998; Gratton et al., 1999; Boxall, 2003). Due to increased competition, globalization, rapid technological change as well as other factors, companies are striving to understand how human resources can be managed to achieve a competitive advantage (Allen & Wright, 2006).

In the following section of the paper, a detailed description of HRM compensation practices of 8 EU member states, 6 CEE member states, and 6 countries around the world, which are very important for the analysis, will be presented in a table and performed.

Table 4: Overview of the dimensions of the national culture of 20 countries according to Hofstede's classification

	Country	Compensation system
EU member states	**Germany**	The legal minimum wage is not set but the introduction for certain industrial sectors or even general is being discussed. The most important item that determines the basic pay for all classes are employee performance, relevant experience and employee classifications. Benefits vary by company size. Some of the forms of benefits that managers have are a company car (for the elderly or those who travel frequently), lunch vouchers, life insurance and/or accident insurance, etc.
	France	Basic earnings are defined through a comprehensive collective bargaining arrangement, with a certain minimum wage. The factor that affects the level of basic pay of managers and professionals most is qualification. Earnings based on seniority are used to a lesser extent. One of the common practices is to allow managers to use cars and other types of benefits in kind (Halima et al., 2018).
	Italy	One of the very important determinants of basic pays at all levels is the educational level and performance, while the content of the job is very important for management. There is no minimum wage, but the Italian constitution guarantees the right to a fair wage. Over the last decade, the frequency of companies offering different types of securities to their shareholders, and especially to top management, has increased (Gigliotti, 2013). Managers generally have high compensation as well as additional benefits like a company car, low-interest loans, mobile phones, etc.
	Sweden	The use of basic pays and bonuses as compensation is rarely applied. An individual, differential salary system is used concerning a certain level of employee responsibility, profession, performance as well as market prices. The minimum wage is not legally defined (Bylander, 2015). When deciding on the salary for a new employee, the previous salary that the employee had is taken into account. For managers in senior positions, some incentives such as cars, accident insurance, life insurance, lunch are used.
	Greece	The minimum wage is set for most employees through collective agreements negotiated annually by the Federation of Greek Industry and the General Confederation of Greek Labour. Due to the recession, there was a reduced amount of the minimum wage for young people, and these changes were implemented in the period 2009-2017 (Georgiadis et al., 2018). Some of the benefits enjoyed mostly by senior executives are car, housing, health coverage, etc.
	Denmark	The minimum wage is not legally determined but the collective agreement sets the minimum wage for a large percentage of the Danish workforce (Westergaard-Nielsen, 2008). The content of the job is the most important determinant of basic pays for all levels of the class, as well as performance, classifications, experience, and seniority. Overtime is not always compensated. The official car and allowances for additional pensions are mainly intended for

		older employees.
	Belgium	Basic pays are defined through collective bargaining. Some of the most important determinants of basic pays for top management are job content and classifications. There is a noticeable decrease in the salary trend based on seniority. The minimum wage for all employees is determined by the National Labor Council. The benefits that managers receive are company car, life insurance that cannot be withdrawn once it is approved, vouchers for meals, etc.
	Netherlands	The minimum wage is determined and employers are obliged to provide employees with the right to holiday pay in the amount of 8% of the gross annual salary of the employee. Internship, job content, and relevant experience are some of the most important determinants of basic pays for managers. Past work is used when defining earnings, but it is used less often. Incentive pays such as company cars, laptops, phones, gifts on special occasions such as anniversaries, etc. are used.
CEE region member states	**Serbia**	Minimum wage is guaranteed by labour law. Earnings are based on seniority and hours spent at work. Modern forms of rewarding are rarely used. There is an increase in the use of individual bonuses. Kucurski (2016) states in his doctoral dissertation that benefits added to the fixed part of managerial salaries include a company car, mobile phone, health and pension insurance, training, various company benefits etc.
	Hungary	The minimum wage is determined every year by the Government, and the payment is made based on hourly or performance. For managers, the compensation system is defined at the individual level and for other employees, it is more often applied at the company level (Karoliny et al., 2009). Large and foreign companies use various forms of incentives such as company cars, insurance, subsidized vacations, and meals to motivate employees to be more efficient and productive and thus make the company's success as good as possible (Poór et al., 2011).
	Slovakia	The minimum wage is determined by law. The compensation system is linked to the organizational strategy. The highest level of earnings is in the capital of Slovakia, and variable earnings are increasingly directed towards earnings based on performance. Stimulation is used for managers and sales staff; some of them are company cars, mobile phones, computers, etc. Slovak tax laws consider that the private use of a company car should be additionally taxed and for that reason, company cars can only be used for work purposes (Kachanakova et al., 2009; Stacho et al., 2017).
	Slovenia	The minimum wage is defined by law. Earnings consist of 3 parts: basic pay + performance earnings + additional payments (such as overtime, night work, etc.) In practice, it is not common for employers to grant benefits to their employees such as a company car or personal injury insurance if certain benefits are not of great importance for a certain type of work (Svetlik & Braček Lalić, 2016).
	Czech Republic	In public enterprises, basic pay is defined at the individual level, while in private enterprises there is a decentralized approach to definition. The minimum wage is defined, paid monthly, with the payment for the production workers being applied according to the produced quantity. There is a noticeable increase in the use of incentive pays; non-financial benefits are used

		for managers and highly professional staff (Koubek, 2009). Managers during their employment generally receive a car, computer, mobile phone, and other benefits for temporary use. These types of benefits are mostly agreed upon by agreement, and based on that, the method of return should be defined if the employer proposes the withdrawal of compensation.
	Bulgaria	The minimum wage in Bulgaria is defined and collective bargaining is applied. Non-financial benefits are used to a lesser extent, while incentive pays are most often used for managers and professional qualities (Morley et al., 2016). Benefits such as a company car, mobile phone, etc. are not mandatory but they are generally approved to managers in senior positions. Private insurance systems and incentive pays are not mandatory in this country (Vatchkova, 2009).
Other countries	**Russia**	The basic pay of a manager is determined based on performance, experience, job content, and seniority. It amounts to 20% of the total figure while 80% are guaranteed supplements and bonuses (Lukiyanova, 2011). The minimum wage is legally defined. As for bonuses, there are sectorial guidelines for the payment of bonuses; for example, in the banking sector as well as for certain state-owned companies, bonuses depend on the performance of the organization. Managers of Russian companies participating in private pension insurance programs have the option of additional pensions (Berber, 2015, p. 184).
	SAD	The minimum wage is defined by law. Wage data analysis is performed to maintain the development of wage levels within the organization. The incentive contains an allowance for difficulties when going to another company located in another state, a departure premium. Standard benefits include paid leave and protection programs, while enhanced benefits include expatriate relocation assistance, expatriate children's education allowances, travel and home allowances, and entertainment allowance (Martocchio, 2004).
	Japan	Basic pay is determined by a long salary tradition where employees can expect an increase in basic pay each year regardless of the performance of the organization (Whitehill, 1991). Employees in Japanese companies expect their status to increase due to promotion in the workplace due to long service and obliging subordinates to treat them with respect and honour. Traditional Japanese rewarding practices are being replaced by newer, more western forms such as car, telephone, etc. (Allen et al., 2004).
	Switzerland	There is no legal minimum wage in Switzerland, wages based on past work are less and less in use. The most important determinants of basic pay are the content of the job, performance, seniority, and experience of the employee. As for the bonus, it can reach up to 15% of the maximum amount of the employee's salary. Supervisors may allow the application of individual bonuses within the budget (Berber, 2015, p. 184).
	India	The basic pay is set at about 40-50% of the fixed fee; the goal is to prevent the exploitation of labour. Incentives for employees are apartment rental fee, medical allowance, transportation fee, travel fee, meals etc. Managers receive various types of compensation for their work, in addition to monetary incentives, i.e. benefits, and these include pension insurance, life, and health insurance, and disability (Jaiswall & Bhattacharyya, 2016).

	UK	The minimum wage is determined based on the age group of employees. The most important determinants of basic pay for all grades, with classifications, performance, job content as well as seniority-based earnings are still used. Benefits mainly include private health insurance and a car (especially for older employees). These benefits can be contracted but care must be taken if the employer proposes to withdraw them (Haque, 2017).

Source: the author, based on: Berber, 2015; https://www.sorainen.com/UserFiles/File/Publications/briefing.Employment-benefits-in-the-European-Union.2007-05-01.Clifford-Chanse-LLP.eng.andisb-agrisr.pdf, https://rewards.aon.com/en-us/

4. Analysis of the influence of national culture on the compensation system in selected countries.

This section will analyse the impact of national culture according to Hofstede for selected countries depending on the strength of the dimension; countries with the lowest values (below 35) and those countries with the highest values (above 75).

The dimension "Power distance" refers to the extent to which society accepts the fact that power in institutions and organizations is not evenly distributed. Based on the presented Table 3, we conclude that countries with a large power distance (value above 75) include: Serbia (86), Slovakia (100), Russia (93), and India (77), while countries with a small power distance (value less than 35) include: Germany (35), Sweden (31), Denmark (18), Switzerland (34), and UK (35). In countries with a great power distance, society accepts a hierarchical order in which everyone has a place, while countries with a low power distance want to equalize the distribution of power and demand justification for inequality. The wage system in countries with a great distance from power is similar in selected countries, the minimum wage is legally determined and is generally set depending on the position, length of service, experience of the employee, and incentives and benefits are determined based on success at work. Employees get the opportunity to use a company car, laptop, mobile phone, and other benefits. Regarding employee incentives, there is a small difference between countries, most employees are additionally stimulated through various systems of simulated earnings, but there are also some differences between countries, so for example in Serbia, modern reward systems are not high, in Russia, 80% of earnings consists of guaranteed extras and bonuses. In contrast to these countries where the minimum wage is defined by law, in countries that have a small distance from power the amount of the minimum wage in most countries is not defined. If the distance from power is observed, in the case of countries with a large power distance, where a hierarchical order is present, there should be a system of rewarding employees for each level at which the employee is to motivate employees from lower levels to more they work and progress to reach a higher hierarchical level where the reward system is at a much higher level. While in countries where power distance is small, countries want to equalize the distribution of power, the proposal is to establish a system of remuneration depending on the work, success, employee, regardless of his position. According to Hofstede (2001), in countries that have a great power distance, there is a tendency towards greater elitism in society. This

refers to those who are in positions in society will not only be more valued but will be able to extract more wealth. Li & Harrison (2008) state that in cultures characterized by a great power distance, there are great differences in authority, earnings, and privileges between those in higher and lower positions. On the other hand, in cultures with a small power distance, more consultation on decision-making is noticeable, and less powerful actors are valued and encouraged.

In the dimension "Individualism", the emphasis is on individual rewarding based on the individual performance of employees, based on their performance at work, etc. Based on the presented Table 3, we conclude that individualistic countries (value above 75) include: Italy (76), the Netherlands (80), Hungary (80), the USA (91), and UK (89), while "collectivist" countries (value below 35) where the success of the group is valued more, but also the success of the individual in the group, include: Serbia (25), Slovenia (27) and Bulgaria (30) – CEE members). Based on the information presented in Table 4, we conclude that in countries that belong to individualistic societies, the work and performance of an individual are valued more than a group, which is especially pronounced in countries with a high degree of individualism (the USA and the UK). Opposite them are three countries that are the only members of CEE, which value the success of the group more, but also the additional effort of the individual in the group. It should be noted that the function of a manager who delegates authority and influences groups to direct them towards success is very important. Parker (2001) points out that employers in countries like the USA reward their employees more based on individual success. Research shows that individualism is strongly associated with a country's national wealth and that employees in highly individualistic cultures associate their success with financial status, leading to the strong use of external rewards in recognizing employee success (Gomez-Mejia & Welbourne, 1991). Conyon & Schwalbach (1997) showed in their study that the percentage of compensation when comparing 10 European countries was the highest in the UK. A study by Giacobbe-Miller et al., (2003), which compared awarding rewards to 66 American, 113 Chinese, and 87 Russian managers. He concludes that "the USA" and "China" represent cultural opposites in the dimensions of "individualism/collectivism" and "power distance". On the other hand, the authors state that "Russia" shares cultural characteristics with both "China" and the USA, which means that Russia is not expected to differ much from any other country.

Based on Table 3 and the information on the salary system shown in Table 4, an analysis of countries belonging to the "male" cultures (value above 75) was performed: Hungary (88), Slovakia (100), and Japan (95). The characteristic of these societies is the high valuation of perseverance, entrepreneurship, and innovation. This can be confirmed based on the fact that in Japan, Slovakia, and Hungary, employees are additionally stimulated if they achieve a certain result and progress in their business. In contrast, the countries that belong to the "female" culture are Sweden (5), Denmark (16), the Netherlands (14), and Slovenia (19). These countries value social status, quality of life, and stability more. Managers strive for a certain status in society to be more rewarded and thus provide themselves with a better quality of life in society. Sweden has a very small value of "male values", and it is characteristic of this country that the minimum wage is not defined

by law, an individual differential system is in use. Kluckhohn and Strodtbeck (1961) also point out that female values are dominant in Denmark, Norway, and Sweden, i.e. that they give a high value to the quality of life and care for others. Tosi and Greckhamer (2004) in their paper emphasizes that cultures with a dominance of male values tend to support greater income inequality, while the situation is reversed in cultures where female values dominate. In addition, the same author points out that countries such as Germany, Japan, and the USA tend to have more gender-differential professional structures where certain jobs are fully assigned to women and others to men, while on the other hand in countries like Sweden and Norway work, employee participation and job satisfaction are preferred. Based on the conducted research, he emphasized in his work that he believes that in cultures with a dominance of male values, the material success of an individual is manifested through a greater difference in earnings, while in feminist cultures, social goals are dominant and that relationship is lower.

Analysing the data presented in the paper, we conclude that countries with a "high degree of uncertainty avoidance" (value over 75) that tend to propagate laws, specific rules, procedures include: France (86), Greece (100), Belgium (94), Serbia (92), Slovenia (88), Bulgaria (85), Russia (95) and Japan (92). In contrast, countries with a "low degree of uncertainty avoidance" (values below 35) that accept risk and uncertainty are Sweden (29) and Denmark (23). Based on the presented data, we conclude that most countries with a high degree of uncertainty (such as Serbia and Greece) had a difficult economic period behind them and that it is for these reasons that they want to reduce the risk to the lowest possible level. Minimum wages in countries with a high degree of risk avoidance are defined by law, so this dimension is confirmed, these countries strive for more laws and rules to make the employee wage system fair. In contrast to these countries, the minimum wage in Sweden is not legally defined, which is precisely the characteristic of countries that have a low degree of risk avoidance, there is a lack of law and other specific rules and procedures. Stanojević (2014) emphasized in his paper that when it comes to risk avoidance, some countries limit performance pay to maintain employee predictability and consistency (Japan, Spain, Turkey, etc.). Gerhart (2008) points out that variable wages, incentives, as well as decentralized wage determination, are present mainly in countries with a low degree of uncertainty avoidance, while on the other hand fixed wages (e.g. basic wages), centralized wage determinations and internal equality have a greater role in countries that have a high degree of risk avoidance. Schuler & Rogovsky (1998) point out that performance-based earnings (especially individual employee performance) are most likely in countries with a low degree of uncertainty avoidance, which is confirmed in the paper to assess individual performance in Denmark and Sweden. As for the distance from power where individual performance is viewed, Denmark and Sweden are among the countries with a small distance from power. Also, the author states that skills-based compensations are more common in countries with a low degree of uncertainty avoidance while length-of-service compensations are probably more prevalent in countries with a high degree of uncertainty avoidance, this is also confirmed in our analysis such as it is the case in Japan, Russia, etc.

The characteristics of countries that are “long-term oriented” (value over 75) are thrift, sense of shame, etc., based on data from Table 3 of countries that are long-term oriented: Germany (83), Belgium (82), Russia (81) and Japan (88). In contrast, “short-term” countries (below 35) include Denmark (35) and the USA (26). The characteristic of this dimension is protection of the person and personal perseverance as well as the fulfilment of social obligations. One of the specifics of this analysis is Japan, where there is a plan for the system of salaries and remuneration of employees in accordance with years of service, while in the USA, which is short-term oriented, employees are rewarded based on performance, and the goal is to achieve more today.

Based on the above Table 3, we come to the conclusion that of the analysed countries, the country that belongs to the “indulgence” category in national culture (over 75) is Sweden (78) and it is characterized by the enjoyment of life and entertainment while in countries that belong to “restraint” category by national culture are Italy (30), Serbia (28), Slovakia (28), Czech Republic (29), Bulgaria (16), Russia (20) and India (26), characterized by control of meeting needs based on strict social norms. What differs significantly in Sweden from other countries is that the basic pay and bonuses are less used, the minimum salary is not legally defined, while in the countries that are abstained it is not the situation, where the minimum salary is determined by law.

Conclusion

Based on the conducted research on the influence of national culture on the compensation system in selected countries, we conclude that in all six dimensions of national culture according to Hofstede's classification there are different influences between selected countries. When comparing the wage system between countries with large and small power distances, it was found that in countries with large power distances, the wage system is similar, the minimum wage is legally determined and is generally set depending on the position, seniority, and experience of the employee, while in countries with a small power distance, the minimum wage is not defined by law. If the distance from power is observed, in the case of countries with great power distance, there is a hierarchical order and a system of rewarding employees for each level, where the employer is to motivate employees from lower levels to work harder and they progress to reach a higher hierarchical level, where the reward system is at a much higher level. On the other hand, in countries where the power distance small, countries want to equalize the distribution of power, the reward system is established depending on the work, success, employee, regardless of position. A comparison of countries based on whether they are more individualistic or collectivist confirms the conclusion that in individualistic cultures (for example Italy, the Netherlands, Hungary, the USA, and the UK) the performance of an individual is more valued than the performance of a group as in collectivist countries such as Serbia, Slovenia, and Bulgaria. When comparing “men” against “women” cultures, employees are additionally stimulated for success and they value innovation and perseverance more. In “women's” cultures, the status and quality of life are more valued. These cultures include countries such as Denmark, the Netherlands, Slovenia, and Sweden. By comparing the countries, it was established that Sweden has a very small value of “male” values, and it is characteristic of

this country that the minimum wage is not defined by law, and an individual differential system is in use. Comparing countries based on the "avoidance of uncertainty" dimension, differences between countries with a high and low degree of avoidance of uncertainty are noticeable. In the case of countries with a high degree of uncertainty avoidance (for example France, Greece, Belgium, Serbia, Slovenia, Bulgaria, Russia, and Japan) the determination of the minimum wage is defined by law and this is one of the characteristics of countries with a high level of uncertainty avoidance, characterised by laws, specific rules, procedures, etc. In contrast, in countries with a low degree of uncertainty avoidance (for example, Sweden and Denmark), the minimum wage is not legally defined in the observed countries. When comparing countries that are long-term oriented versus those that are short-term oriented, a different impact on the compensation system is noticeable, and the two countries stand out. One of the specifics of this analysis is Japan, where there is a plan regarding the system of salaries and remuneration of employees in accordance with years of service, this country is known for planning everything for a longer period, so in accordance with the compensation system in the long run. While this is not the situation in the USA: this country is short-term oriented, employees are rewarded based on performance, more effort and success of the individual is seen. As stated, this country belongs to the individualistic culture and thus confirms this thesis that individual performance is more valued. Based on the comparison of countries based on the last dimension according to Hofstede, indulgence/restraint, it is noticeable that in Sweden, which belongs to indulgent cultures where enjoyment of life is seen more than savings, the minimum wage is not legally defined and bonuses are less used. On the other hand, we have the example of countries like Serbia, which belongs to the restrained culture, which is characterized by the control of meeting needs based on social norms, less spending, no emphasis on free time. In general, all CEE member countries have shown restraint. The dimensions of national culture affect the compensation system in selected countries and there are significant differences in the elements of the wage system in the observed countries, which is partly explained by differences in the dimensions of national culture.

All human resource managers, especially those working in multinational companies, should be aware of the different dimensions of national culture on the compensation system as well as the specifics of the basic pay system, incentives, and benefits of different countries to create a compensation package that will contribute to employee satisfaction.

Limitation of the research lies in the fact that the available non-standardized secondary data on HRM practice were used. Future directions of research can be seen in deeper analysis based on empirical research on specific practice in selected countries, on a representative sample. In the research, the researchers should determine the indicators of economic development such as GDI per capita, FDI per capita, unemployment rate, average wages of employees, etc.

References

Allen, M. R., & Wright, P. M. 2007. *Strategic management and HRM*. In P. F. Boxall, J. Purcell, & P. M. Wright (Eds.), The Oxford handbook of human resource management (p. 88-107). Oxford: Oxford University Press. Doi: http://dx.doi.org/10.1093/oxfordhb/9780199547029.003.0005

Allen, R. S., Takeda, M. B., White, C. S., & Helms, M. M. (2004). Rewards and organizational performance in Japan and the United States: a comparison. *Compensation & Benefits Review*, *36*(1), 7-14. Doi: https://doi.org/10.1177%2F0886368703261401

Almond, P., Clark, I., & Tregaskis, O. (2004). *HRM in multinationals: a comparative international perspective*. In I. Beardwell, L. Holden, & T. Claydon (Eds.), Human Resource Management: A Contemporary Approach (p. 587-636). Harlow: Prentice-Hall.

Andrijauskienė, M., & Dumčiuvienė, D. (2017). Hofstede's cultural dimensions and national innovation level. In *DIEM: Dubrovnik International Economic Meeting*, 3(1), 189-205.

Berber, N. (2015). *Komparacija upravljanja kompenzacijama u Republici Srbiji i zemljama Evrope.* Doktorska disertacija. Subotica: Ekonomski fakultet u Subotici.

Berber, N., Morley, M. J., Slavić, A., & Poór, J. (2017). Management compensation systems in Central and Eastern Europe: a comparative analysis. *The International Journal of Human Resource Management,* 28(12), 1661–1689. Doi: https://doi.org/10.1080/09585192.2016.1277364

Boxall, P. (2003). HR strategy and competitive advantage in the service sector. *Human Resource Management Journal,* 13(3), 5–20. Doi: https://doi.org/10.1111/j.1748-8583.2003.tb00095.x

Bylander, E. (2015). *Evidence in civil law-Sweden*. Institute for Local Self-Government and Public Procurement Maribor. Doi: https://doi.org/10.4335/978-961-6842-60-0

Conyon, M. J., & Schwalbach, J. (1997). European differences in executive pay and corporate governance. *Humboldt-Universität zu Berlin.* 97-114 Doi: https://doi.org/10.18452/9360

Decenzo D.A., & Robbins S.P. (2002). *Human Resource Management, 7th edition*. Danvers: John Wiley & Sons.

Dessler, G. (2002). *Framework of Human Resource Management*, *2nd edition*. New Jersey: The Dryden Press, Prentice Hall.

Fay, C. H., & Thompson, M. A. (2001). Contextual determinants of reward systems' success: An exploratory study. *Human Resource Management*, *40*(3), 213-226. Doi: https://doi.org/10.1002/hrm.1012

Georgiadis, A., Kaplanis, I., & Monastiriotis, V. (2018). *The impact of minimum wages on wages and employment: evidence from Greece.* GreeSE Paper 131. London: Hellenic Observatory, LSE.

Gerhart, B. (2008). *Compensation and national culture*. In L.R. Gomez-Mejia and S. Werner (Eds.), Global compensation: Foundations and perspectives (p. 142-57). London: Rutledge.

Giacobbe-Miller, J.K., Miller, D.J., Zhang, W., & Victorov, V.I. (2003). Country and organization-level adaptation to foreign workplace ideologies: A comparative study of distributive justice values in China, Russia and the United States. *Journal of International Business Studies,* 34, 389–406. Doi: https://doi.org/10.1057/palgrave.jibs.8400040

Gigliotti, M. (2013). The compensation of top managers and the performance of Italian firms. *The International Journal of Human Resource Management,* 24(4), 889–903. Doi: https://doi.org/10.1080/09585192.2012.702317

Gomez-Mejia, L. R., & Welbourne, T. (1991). Compensation strategies in a global context. *Human Resource Planning*, *14*(1), 29-41.

Gratton, L., Hope Hailey, V., Stiles, P., & Truss, C. (1999). *Strategic Human Resource Management: Corporate Rhetoric and Human Reality*. Oxford University Press. Doi: https://doi.org/10.1093/acprof:oso/9780198782049.001.0001

Halima, M. A. B., Koubi, M., & Regaert, C. (2018). The effects of the complementary compensation on sickness absence: an approach based on collective bargaining agreements in France. *Labour*, *32*(3), 353-394. Doi: https://doi.org/10.1111/labr.12123

Haque, F. (2017). The effects of board characteristics and sustainable compensation policy on carbon performance of UK firms. *The British Accounting Review*, *49*(3), 347-364. Doi: https://doi.org/10.1016/j.bar.2017.01.001

Hofstede G. (1984). *Culture's consequences: international differences in work-related values.* Newbury Park, *CA:* Sage Publications.

Hofstede, G. (1991). *Cultures and organizations: Software of the mind* (London and New York, McGraw hill). House, RJ, Hanges, PJ, Javidan, M., Dorfman, PW, & Gupta, V. (Eds. 2004), Airaksinen, 1-25.

Hofstede, G. (2001). *Culture's consequences: Comparing values, behaviors, institutions and organizations across nations.* London, New Delhi: Sage Publications.

Hofstede, G., Hofstede, G. J., & Minkov, M. (2005*). Cultures and organizations: Software of the mind* (Vol. 2). New York: Mcgraw-Hill.

Hofstede, G., & Minkov, M. (2010). Long-versus short-term orientation: new perspectives. *Asia Pacific Business Review, 16*(4), 493-504, Doi: https://doi.org/13602381003637609

Jaiswall, S. S. K., & Bhattacharyya, A. K. (2016). Corporate governance and CEO compensation in Indian firms. *Journal of Contemporary Accounting & Economics*, *12*(2), 159-175. Doi: https://doi.org/10.1016/j.jcae.2016.06.001

Kachanakova, A., Nachtmannova, O., Janiakova, Z., Roby, Z., Zubrikova, D., & Blstakova, J. (2009). Managing human resources in Slovakia. In M. J. Morley, N. Heraty, & S. Michailova (Eds.), *Managing Human Resources in Central and Eastern Europe* (p. 158–187). Oxon: Routledge

Karoliny, Z., Farkas, F., & Poór, J. (2009). In focus: Hungarian and Central Eastern European characteristics of human resource management — an international comparative survey. *Journal of East European Management Studies, 14*(1), 9-47. Doi: https://doi.org/10.5771/0949-6181-2009-1-9

Kluckhohn, F. R., & Strodtbeck, F. L. (1961). *Variations in value orientations*. Row, Peterson.

Koubek, J. (2009). Managing Human Resource in the Czech Republic. In M. Morley, N. Heraty, & S. Michailova. (2009). Managing Human Resources in Central and Eastern Europe (p. 132-157). London and New York: Routledge.

Kucurski, M. (2016). *Uticaj modela nagrađivanja menadžera i zaposlenih na performanse organizacija u Srbiji.* Doktorska disertacija. Beograd: Univerzutet Singidunum.

Li, J., & Harrison, J. R. (2008). National culture and the composition and leadership structure of boards of directors. *Corporate Governance: An International Review*, *16*(5), 375-385. Doi: https://doi.org/10.1111/j.1467-8683.2008.00697.x

Lowe, K. B., Milliman, J., De Cieri, H., & Dowling, P. J. (2002). International compensation practices: a ten-country comparative analysis. *Human Resource Management, 41*(1), 45–66. Doi: https://doi.org/10.1002/hrm.10019

Lukiyanova, A. (2011). *Effects of minimum wages on the Russian wage distribution*. Higher School of Economics Research Paper No. WP BRP 9. Doi: https://dx.doi.org/10.2139/ssrn.2002938

Maksimović, V. (2014). International aspect of human resource management: Case study: company 'Rapp Marine Group' in Serbia. *Ekonomski signali*, *9*(2), 63-83. Doi: https://doi.org/10.5937/ekonsig1402063M

Martocchio, J. J. (2004). *Strategic compensation: a human resource management approach*. Pearson Education India.

Morley, M. J., Heraty, N., & Michailova, S. (Eds.). (2016). *Managing human resources in Central and Eastern Europe.* London: Routledge.

Parker, G. (2001). Establishing remuneration practices across culturally diverse environments. *Compensation & Benefits Management*, 17(2), 23-23.

Pfeffer, J., & Jeffrey, P. (1998). *The human equation: Building profits by putting people first*. Boston: Harvard Business Press.

Poór, J., Karoliny, Z., Alas, R., & Vatchkova, E. (2011). Comparative international human resource management (CIHRM) in the light of the Cranet regional research survey in transitional economies. *Employee Relations*, 33, 428–443. Doi: https://doi.org/10.1108/01425451111142710

Schuler, R. S., & Rogovsky, N. (1998). Understanding compensation practice variations across firms: The impact of national culture. *Journal of International business studies*, *29*(1), 159-177. Doi: https://doi.org/10.1057/palgrave.jibs.8490030

Slavić, A., Berber, N., & Leković, B. (2014). Performance management in international human resource management. *Serbian Journal of Management*, *9*(1), 45-58. Doi: https://doi.org/10.5937/sjm9-4678

Soares, A. M., Farhangmehr, M., & Shoham, A. (2007). Hofstede's dimensions of culture in international marketing studies. *Journal of Business Research, 60(3),* 277 284. Doi: https://doi.org/10.1016/j.jbusres.2006.10.018

Stacho, Z., Stachová, K., Hudáková, M., & Stasiak-Betlejewska, R. (2017). Employee adaptation as key activity in human resource management upon implementing and maintaining desired organisational culture. *Serbian Journal of Management*, *12*(2), 303-313. Doi: https://doi.org/10.5937/sjm12-10340

Stanojević, M. D. (2014) Kompenzacije u međunarodnom menadžmentu ljudskih resursa. *Svarog*, 9, 180-193.

Svetlik, I., & Braček Lalić, A. (2016). The impact of the internationalisation of higher education on academic staff development–the case of Slovenian public universities. *Studies in Higher Education*, *41*(2), 364-380. Doi: https://doi.org/10.1080/03075079.2014.942266

Štangl Šusnjar, G., & Leković, B. (2009). Performance-based pay in human resources development. *Strategic Management*, 14, 1–14.

Štangl Šušnjar, G., Slavić, A. & Berber, N. (2017). *Menadžment ljudskih resursa*. Subotica: Ekonomski fakultet u Subotici.

Taylor, S., Beechler, S. & Napier, N. (1996). Toward an integrative model of strategic international human resource management. *Academy of Management Review*, 21(4), 959–985. Doi: https://doi.org/10.5465/amr.1996.9704071860

Tosi, H. L., & Greckhamer, T. (2004). Culture and CEO compensation. *Organization Science*, *15*(6), 657-670. Doi: https://doi.org/10.1287/orsc.1040.0099

Vatchkova, E. (2009). *Managing human resources in Bulgaria*. In M. J. Morley, N. Heraty, & S. Michailova (Eds.), Managing human resources in Central and Eastern Europe (p. 243–277). Oxon: Routledge

Westergaard-Nielsen, N. (Ed.). (2008). *Low-wage work in Denmark*. New York: Russell Sage Foundation.

Whitehill, A. M. (1991). *Japanese management: Tradition and transition*. London: Routledge.

Clifford Chance. (2007, May). Employment and Benefits in the European Union. Retrieved May 17, from https://www.sorainen.com/UserFiles/File/Publications/briefing.Employment-benefits-in-the-European-Union.2007-05-01.Clifford-Chanse-LLP.eng.andisb-agrisr.pdf

Hofstede insights (2021). Retrieved: April 3, 2021 from https://www.hofstede-insights.com/product/compare-countries/.

Rewards Solutions (2021). Retrieved: April 3, 2021 from https://rewards.aon.com/en-us/

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Openness of companies in Serbia to creativity, new ideas and innovation

Отвореност предузећа у Србији за креативност, нове идеје и иновације

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Abstract: The subject of research in this paper is the analysis of openness of companies operating in Serbia to creativity, recognition of new ideas and innovations regardless of size, time period of their operation and the level at which they operate. In conditions of strong competition inovating new categories of products/services is an imperative for the survival of the company, as the number of customers in the world who seek innovation in consumption is growing. The research was conducted based on a specially designed questionnaire on a sample of one hundred and thirty-six companies. The initial assumption is that the inadequate commitment of companies to create innovation causes poor competitiveness in both the national and international markets. The purpose of the research is to evaluate the selected characteristics – the level of openness of the company to entrepreneurship and innovation; identification of the importance of employees in the company as indicators of inventiveness and new ideas; and identifying opportunities and additional initiatives that come from outside the company and are important for the lasting survival of their business in the market. The results of the research show the openness of the company to creativity and new ideas that use the function of permanent survival of the company in the market significantly. In this research, the method of comparative statistics, the hypothetical - deductive method, the analytical-deductive and comparative method, and the historical and statistical - descriptive method were used.
Keywords: creativity, innovation, business level, length of business, company.
JEL classification: L21, O31

Сажетак: Предмет истраживања у овом раду је анализа отворености предузећа која послују у Србији за креативност, препознавање нових идеја и иновација независно од величине, временског периода њиховог функционисања и нивоа на коме послују. У условима снажне конкуренције иновирање нових категорија производа/ услуга је императив за њихов опстанак, с обзиром да у свету расте број купаца жељних иновација у потрошњи. Истраживање је реализовано на бази посебно осмишљеног упитника на узорку од стотридесетшест предузећа. Полазна претпоставка је да неадекватна опредељеност предузећа за креирање иновација проузрокује лошу конкурентску способност како на националном, тако и на међународном тржишту. Сврха истраживања је вредновање селектованих карактеристика - нивоа отворености предузећа за предузимљивост и иновације; идентификације значаја запослених у предузећу као индикатора инвентивности и нових идеја и; уочавање могућности и додатних иницијатива које долазе изван предузећа важних за трајни опстанак њиховог бизниса на тржишту. Резултати истраживања показују да отвореност предузећа за креативност и нове идеје битно утичу на функцију трајног опстанка предузећа на тржишту. У овом истраживању коришћене су методе компаративне статистике, хипотетско -

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дедуктивне методе, аналитичко - дедуктивне и компаративне методе, историјске и статистичко - дескриптивне методе.
Кључне речи: креативност, иновације, ниво пословања, дужина пословања, предузеће.
ЈЕЛ класификација: L21, O31

Introduction

At present, it is impossible to imagine the business of a company without constant innovation and introduction of creative solutions. In conditions of strong competition and a saturated market, companies that do not innovate stagnate and eventually disappear from the market. Hence, innovation is imperative for companies, given that the number of customers in the world who seek innovation in consumption is growing. The general view is that the long-term development of companies stems from their ability to constantly develop and produce innovative products (Sternberg, 2000). There are different ways in which companies can change and improve their business. A different view of the market and the needs of consumers outside the established norms normi (Perčić et al., 2017) lead to the creation of new product categories. As one of the specific tools of entrepreneurship (Kicová, 2019) innovation aims to offer a new, different meaning of products to customers. In that sense, creativity is the starting point, whether it is connected with invention or with perceiving possibilities discoveries in the field of artificial intelligence (Nica et al., 2018). Together, creativity and innovation by their very nature presume a continuous pursuit of change.

Seeking opportunities for new ideas and chances to be different, to do something in a better, more successful and more efficient way than the existing one is a requirement that is placed before individual companies and the economy as a whole. This can be seen (Djordjević, 2017) through the search for favorable opportunities or through the monitoring of trends and changes in the environment that no one else has noticed or paid attention to, through the introduction of new products/services (Almeidaa & Miguelb, 2007) or new ways of doing business that impose continuous innovation, and through company growth.

Sources of innovation are mainly located in the manufacturing and service sectors, while other groups of sources (Smith, 2010; Ružić Mosurović, 2012) or favorable opportunities for innovation are found outside a certain activity (individuals, research laboratories, corporations, users, employees, outsiders etc.). In relation to sources, innovations and new ideas usually arise from something unexpected, from demographic and technological (Liu & Jiang, 2016) changes, from new knowledge, etc. The dominant factors in the emergence of innovation are the market and technology (Plamberg, 2004; Almeida & Fernandes, 2007), which ultimately represent the commercialization of an idea.

If the innovation is successful, the question is how much the company will benefit from it in terms of materialization itself, i.e. achieving market advantage or profit (Stanković et al., 2014). Numerous studies have shown that the introduction of institutional innovations affects the positioning of companies in the market (Sokolov-Mladenović, 2020). It is possible that a company misses a chance and makes a profit by not using exceptional innovation in the right way. That is why it is believed that innovation is

ultimately a relative concept, considering that the idea itself does not mean the market success of the company. Being the first on the market brings profit, and all subsequent actors have a smaller market share (Vukajlović & Ćurčić, 2016), and thus less profit. This is a key reason why companies strive to develop their innovativeness (Cruz-Ros et al., 2017), as it is an important factor in achieving competitive advantage.

Having in mind the way companies operate in Serbia, it seems that there is significant room for creativity and innovation of products and processes (Rajković, 2015). The concept of open innovation (Janković & Golubović, 2019) contributes to improving the innovation of the SME sector as a key driver of growth of their competitiveness in the knowledge economy. When it comes to product innovations, in addition to engineering, they also require market and design knowledge, depending on the sector in which the company operates (Vujičić et al., 2021). Numerous companies in Serbia are primarily production-oriented and aware of the lack of market knowledge, while there is a small number of companies that are aware of the lack of and need for knowledge in the field of industrial design and marketing (Miletić et al., 2019).

The need for this knowledge is determined by the position in the value chain and the business model that companies use. In general, domestic companies tend to improve existing and develop new products and services. Thus, any intervention (Bojović et al., 2010) that reduces production and administration costs, increases productivity or utilization of equipment (capacity) or time, improves the quality of products/services, raises the level of safety of their use, reduces waste, improves placement etc. is treated as creative intervention.

1. Research starting point and methodological approach

The research was conducted with the aim of assessing the openness of companies in Serbia for creativity, new ideas and the creation of innovations, which operate for different periods of time and at different levels of functioning. The study was modeled on the so-called model of open innovation, using relevant methods. In addition to the basic explicative method, a bibliographic speculative method was used in the process of establishing the theoretical foundation of the paper, and during the processing and interpretation of the results, the method of multiple comparison and statistical test was used. Research premise: The openness of the company to creativity and unique ideas necessary for the development of competitive abilities and the level of business as a variable significantly affects the function of the permanent survival of the company (its business) in the market.

The research was conducted on a sample of 136 respondent companies, in order to achieve representativeness of the same. An intentional sample was used for the research. The survey was conducted through an online survey and personal communication. The survey was anonymous and referred only to companies operating in Serbia. Choosing companies as a sample, the crucial factor was the success of their business in the national business framework. The questions from the survey were answered by one respondent from the ownership structure of the company or from the top management of a higher level, from

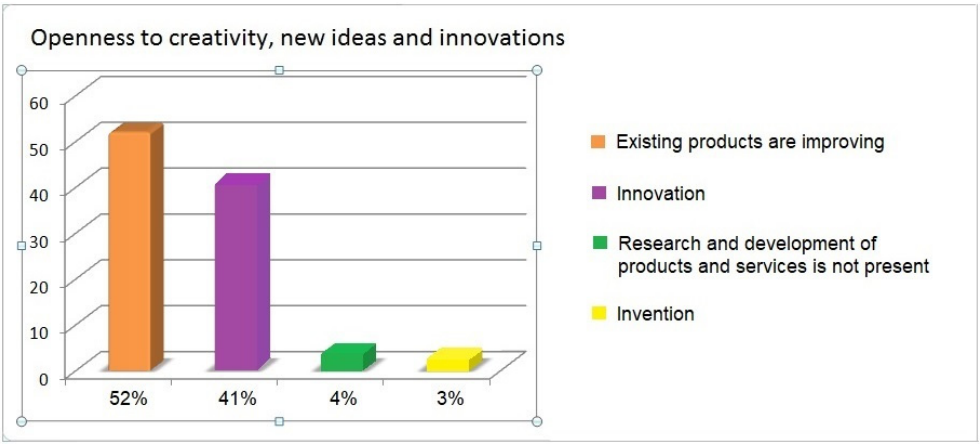
the entire territory of the Serbia. The response rate was 94%. The purpose of the survey was to gather information from company managers regarding what they think about how creative and open their organizations are to specific ideas and innovations, i.e. turning a creative idea into a product/service or process that can be commercialized. The questionnaire consisted of several questions (independent variables): organization size (up to 10 employees – micro organization, from 11 to 50 employees – small organization, from 51 to 250 employees – medium organization, over 251 employees – large organization); the length of business of the organization; the activity of the organization; the business sector of the organization; the level (market) of business organization (local, national, regional, international); etc. The dependent variables in the questionnaire included: the level of openness of the company to creativity, new ideas and innovations either related to invention or related to the perception of market opportunities; employees in the company as sources of creativity and new ideas; and the sources of creativity and new ideas coming from outside the company.

The research was conducted as a cross - sectional study of analytical nature in order to conceptualize the importance of the considered elements. The evaluation of characteristics important for improving the competitiveness of the company, taking into account the answers obtained by the surveyed managers of the company, were processed by ANOVA test and non-parametric $\chi 2$ test (existence of statistically significant difference for the values of $Sig \leq 0.05$). In the research part presented in this paper, the primary sources of information and knowledge were mostly used.

2. Results and discussion

The evaluation of endogenous characteristics related to employees in the company as sources of creativity and new ideas, which relate to the company's focus on inventiveness, special ideas and innovations important for improving the competitiveness of companies operating in Serbia, is given in the interaction of variables of different business lengths and business levels.

At the beginning, the degree of research and development in companies in the observed sample was analyzed, and the obtained results show that in 70 companies existing products are being improved, in 56 companies there is innovation, in 4 companies there is invention and in 6 companies there is no product/service research and development. The percentage ratio of research and development activities in companies in the sample is presented in Graph 1.



Graph 1. Measure of research and development in the companies from the sample
Source: Authors

Respondent companies operating in Serbia were asked to evaluate pre-selected characteristics regarding the improvement of business performance: the level of openness of companies for creativity, new ideas and innovations; employees in the company as sources of creativity and new ideas; and sources of creativity and new ideas coming from outside the company. The starting point is that successful companies need to meet certain conditions and criteria for functioning. Such respondents were expected to evaluate the characteristics within their business with grades from 1 to 5, with 1 being the lowest grade and 5 the highest. The results of the research by individual characteristics are given in Table 1.

Table 1. Evaluation of characteristics of importance for the improvement of the company's business

The characteristics	Rates									
	1		2		3		4		5	
	Af	Rf	Af	Rf	Af	Rf	Af	Rf	Af	Rf
Level of openness companies for creativity, new ideas and innovation	2	1,5	5	3,7	36	26,5	45	33,1	48	35,3
Employees in the company as a source of creativity and new ideas	3	2,2	15	11,0	34	25,0	39	28,7	45	33,1
Sources of creativity and new ideas coming from the outside of the company	5	3,7	31	22,8	50	36,8	29	21,3	21	15,4

Af - absolute frequencies; Rf - relative frequencies (percentages); S.Vr. - Mean values
Source: the authors

The business performance rank of the company is shown in Table 2 based on average ratings (mean values - S.Vr) for each characteristic.

Table 2. Rank characteristics

The characteristics	Mean	R a t e s
Level of openness companies for creativity, new ideas and innovation	3,97	5
Employees in the company as a source of creativity and new ideas	3,79	13
Sources of creativity and new ideas coming from the outside of the company	3,22	22

Source: the authors

It can be concluded from the table that the companies included in the sample evaluated (Miletić, 2020, p. 172) the selected characteristics in the following way: the level of openness of companies for creativity, new ideas and innovations with a grade 3.97; employees in the company as sources of creativity and new ideas were also rated 3.97; while the lowest score (3.22) was given to sources of creativity and new ideas coming from outside the company.

Further, a two-factor analysis assessed how the length of business and the level of business (local, national, regional and international) affect the disproportions in the business characteristics of the company (its business in the market), as an imperative to maintain a competitive advantage. The value of 0.05 is taken as the level of significant difference (for all values of Sig≤0.05 there is a statistically significant difference).

The mean values of the assessments of the company's openness to creativity, new ideas and innovations that operate for different periods of time and at different levels specifically for each level and length of business are given in Table 3. The standard deviation (Std. Deviation) represents the deviation of the mean value of the assessment, and N the number of respondents in the sample. It can be seen that the openness of companies for creativity, new ideas and innovations is best assessed among those who operate in the international market, and within this group companies that operate from 11 to 20 years ranked this characteristic the highest.

Table 3. Mean value of assessments of the company's openness to creativity, new ideas and innovations

Business level	Length of business of the company	The mean value of the rates	Std. Deviation	N
Local market	From 6 to 10 years	3.50	.577	4
	From 11 to 20 years	5.00	.000	3
	From 21 to 30 years	4.75	.463	8
	From 31 to 40 years	1.00	.000	2
	Over 40 years	4.06	1.345	17
National market	Up to 5 years	4.29	.488	7
	From 11 to 20 years	4.00	.000	2
	From 21 to 30 years	3.67	.866	9
	From 31 to 40 years	3.00	.816	10

	Over 40 years	3.00	.000	2
	Up to 5 years	3.00	.000	4
	From 6 to 10 years	3.50	.826	34
Regional market	From 21 to 30 years	4.00	.000	2
	From 31 to 40 years	3.75	.463	8
	Over 40 years	4.50	.577	4
	Up to 5 years	4.33	1.000	9
	From 6 to 10 years	4.13	.757	23
International market	From 11 to 20 years	4.27	.704	15
	From 31 to 40 years	4.50	.798	12
	Over 40 years	4.29	.845	21
	Up to 5 years	3.00	.000	3
	From 6 to 10 years	3.64	1.027	11
	From 11 to 20 years	4.15	.884	62
Total	From 21 to 30 years	4.29	.488	7
	Over 40 years	4.09	.668	23
	Up to 5 years	4.13	.833	32
	From 6 to 10 years	4.09	.971	43
	From 11 to 20 years	3.00	.000	5
	From 21 to 30 years	3.58	1.238	26
	From 31 to 40 years	3.97	.950	136

Source: the authors

The significance of the interaction between the length of business of the company and the level of business is given in Table 4. In the column Business level / Business length Sig = 0.000, which is less than 0.05, so it can be stated that there are significant disparities in the assessments of the company's openness to creativity, new ideas and innovations. Thus, the impact of the interaction of business levels and business length is statistically significant.

After the analysis of the comprehensive impact, an assessment of individual impacts was made. The Sig column for the business level is 0.008, which is less than 0.05, so it can be concluded that the business level of the company has a significant impact on the assessments of their openness to creativity, new ideas and innovations. In the Sig column for the length of business, the value Sig = 0.000 <0.05 is seen, so it can be concluded that the length of business also significantly affects the differences in grades. It follows that the level of business and the length of business play a significant role in the disproportion in assessing the openness of the company to creativity, new ideas and innovations.

Table 4. The impact of the interaction of variables Business level and Length of business on the assessment of openness to creativity, new ideas and innovations

Variables	Df	Mean Square	F	Sig.
Business level	3	2.296	4.120	.008
Length of business	5	4.874	8.747	.000
Business level / Length of business	10	3.010	5.402	.000

Source: the authors

It was also evident that individual influences of business level and length of business differ. The subsequent Tukey test established which companies, depending on the level of business, differ in grades. The test results show that the evaluations of individual companies that operate for a different period of time also differ significantly. Table 5 shows that there are significant differences between the ratings of companies operating at the national and regional level and the ratings of companies operating at the national and international level.

Table 5. Comparative analysis of different levels of business operations regarding the assessments of openness to creativity, new ideas and innovations

(I) The level of business of the company	(J) The level of business of the company	Mean value of the difference (I-J)	Standard Error	Error signicance (Sig)	95% Confidence interval	
					Lower limit	Upper limit
Local market	National market	.56	.222	.062	-.02	1.14
	Regional market	-.07	.239	.991	-.69	.55
	International market	-.09	.204	.975	-.62	.45
National market	Local market	-.56	.222	.062	-1.14	.02
	Regional market	-.63(*)	.202	.012	-1.16	-.11
	International market	-.65(*)	.159	.001	-1.06	-.23
Regional market	Local market	.07	.239	.991	-.55	.69
	National market	.63(*)	.202	.012	.11	1.16
	International market	-.01	.182	1.000	-.49	.46
International market	Local market	.09	.204	.975	-.45	.62
	National market	.65(*)	.159	.001	.23	1.06
	Regional market	.01	.182	1.000	-.46	.49

Source: the authors

Table 6 suggests that there is a particular difference in the assessments of companies operating up to 5 years and those operating from 31 to 40 years, companies operating from 6 to 10 years and those operating from 31 to 40 years, companies operating from 11 to 20 years and those operating from 31 to 40 years, and companies operating from 21 to 30 years and those operating from 31 to 40 years.

Table 6. Comparative analysis of different lenghts of business operations regarding the assessment of their openness to creativity, new ideas and innovations

(I) Length of business of the company	(J) Length of business of the company	Mean value of the difference (I-J)	Standard Error	Error signi-fcance (Sig)	95% Confidence interval	
		Lower limit	Upper limit	Lower limit	Lower limit	Upper limit
Up to 5 years	From 6 to 10 years	.20	.322	.990	-.73	1.13
	From 11 to 20 years	.16	.311	.995	-.74	1.06
	From 21 to 30 years	.19	.304	.988	-.69	1.07

	From 31 to 40 years	1.29(*)	.437	.044	.02	2.55
	Over 40 years	.71	.318	.232	-.21	1.63
From 6 to 10 years	Up to 5 years	-.20	.322	.990	-1.13	.73
	From 11 to 20 years	-.04	.204	1.000	-.63	.55
	From 21 to 30 years	-.01	.193	1.000	-.56	.55
	From 31 to 40 years	1.09(*)	.368	.043	.02	2.15
	Over 40 years	.51	.214	.169	-.11	1.13
From 11 to 20 years	Up to 5 years	-.16	.311	.995	-1.06	.74
	From 6 to 10 years	.04	.204	1.000	-.55	.63
	From 21 to 30 years	.03	.174	1.000	-.47	.54
	From 31 to 40 years	1.13(*)	.359	.026	.08	2.17
	Over 40 years	.55	.197	.068	-.02	1.12
From 21 to 30 years	Up to 5 years	-.19	.304	.988	-1.07	.69
	From 6 to 10 years	.01	.193	1.000	-.55	.56
	From 11 to 20 years	-.03	.174	1.000	-.54	.47
	From 31 to 40 years	1.09(*)	.353	.029	.07	2.11
	Over 40 years	.52	.185	.067	-.02	1.05
From 31 to 40 years	Up to 5 years	-1.29(*)	.437	.044	-2.55	-.02
	From 6 to 10 years	-1.09(*)	.368	.043	-2.15	-.02
	From 11 to 20 years	-1.13(*)	.359	.026	-2.17	-.08
	From 21 to 30 years	-1.09(*)	.353	.029	-2.11	-.07
	From 31 to 40 years	-.58	.365	.612	-1.63	.48
Over 40 years	Up to 5 years	-.71	.318	.232	-1.63	.21
	From 6 to 10 years	-.51	.214	.169	-1.13	.11
	From 11 to 20 years	-.55	.197	.068	-1.12	.02
	From 21 to 30 years	-.52	.185	.067	-1.05	.02
	From 31 to 40 years	.58	.365	.612	-.48	1.63

Source: the authors

The mean values of the ratings of employees as a source of new ideas are given in Table 7 for each level and length of business. The standard deviation (Std. Deviation) represents the deviation of the mean value of the assessment, and N the number of respondents in the sample. It can be seen that companies that operate at the regional level, and within them those that have been operating from 21 to 30 years, have best rated employees as a source of new ideas.

Table 7. Mean value of employee ratings in the company as a source of new ideas

Business level	Length of business of the company	Mean	Std. Deviation	N
Local market	From 6 to 10 years	3.00	1.155	4
	From 11 to 20 years	5.00	.000	3
	From 21 to 30 years	3.75	.463	8
	Over 40 years	5.00	.000	2
	Total	3.94	.966	17
National market	Up to 5 years	4.71	.488	
	From 6 to 10 years	4.00	.000	2
	From 11 to 20 years	2.89	1.269	9
	From 21 to 30 years	2.90	1.370	10
	From 31 to 40 years	4.00	.000	2
	Over 40 years	3.50	1.732	4
	Total	3.47	1.331	34
Regional market	From 6 to 10 years	3.00	.000	2
	From 11 to 20 years	3.75	1.165	8
	From 21 to 30 years	5.00	.000	4
	Over 40 years	4.33	1.000	9
	Total	4.13	1.058	23
International market	From 6 to 10 years	3.87	1.125	15
	From 11 to 20 years	3.92	.900	12
	From 21 to 30 years	4.10	.889	21
	From 31 to 40 years	3.00	.000	3
	Over 40 years	3.27	.786	11
	Total	3.81	.955	62
Total	Up to 5 years	4.71	.488	7
	From 6 to 10 years	3.65	1.071	23
	From 11 to 20 years	3.69	1.176	32
	From 21 to 30 years	3.84	1.090	43
	From 31 to 40 years	3.40	.548	5
	Over 40 years	3.81	1.132	26
	Total	3.79	1.089	136

Source: the authors

The influence of the relation between the length of business and the level of business of the company on the evaluations of employees as a source of creativity and new ideas is given in Table 8. In the column Business level / Business length, Sig = 0.004, which is less than 0.05, so it can be concluded that there are noticeable disparities in the evaluations of

employees as a source of creativity and new ideas. The impact of the interaction between the level of business and the length of business is statistically significant.

After assessing the overall impact, the individual impacts are assessed. In the Sig column, the value for the business level is Sig = 0.121> 0.05, which means that the business level of the company does not have a significant impact on the ratings of employees as a source of creativity and new ideas. In the Sig column for the length of business, the value of 0.083 is seen, which is also higher than 0.05, so it is concluded that the length of business does not significantly affect the differences in grades.

Table 8. The impact of the interaction of variables Business level and Length of business on the ratings of employees as a source of creativity and new ideas

Variables	Df	Mean Square	F	Sig.
Business level	3	4.528	4.865	.003
Length of business	5	2.311	2.483	.036
Business level / Length of business	10	9.626	10.340	.000

Source: the authors

Based on this, it can be concluded that the level of business and length of business play a significant role in differences in the ratings of employees as a source of creativity and new ideas observed through the joint influence of variables, while individual influence of variables is not significant.

Conclusion

The results of the research confirmed the assumption that the openness of the company to creativity and new ideas necessary for the development of competitive abilities in relation to the level and length of business as variables significantly affect the permanent survival of the company in the market. The openness to creativity, new ideas and innovations important for the development of the company's competitiveness was evaluated with a score 3.97; employees in the company as sources of creativity and new ideas were rated 3.79; while the sources of creativity and new ideas coming from outside the company were rated 3.22. It can be further concluded from the results of this study that in 52% of the companies in the sample already existing products are improved, in 41% of companies operating at the national and regional level there is innovation, in 4% of companies there is invention, and in 3% of companies operating in the local market from 6 to 10 years research and development of products and services is not present.

The two-factor assessment determined the influence of the length of business and the level of business on the disproportions in the characteristics of the functioning of the company as a precondition for maintaining a competitive advantage. It can be seen that openness to creativity, new ideas and innovations is best rated in companies operating in the international market, and among them in companies operating from 11 to 20 years. The impact of the interaction between the business level and the length of the business is statistically significant, given that Sig. = 0.000<0.05, which indicates that there are significant differences in the assessments of the company's openness to creativity, new

ideas and innovations. The assessment of individual impacts shows that the level of business of the company is Sig. = 0.008<0.05, which indicates that the level of business has a significant impact on the evaluation of the company's openness to creativity, new ideas and innovations. The value for the length of business is Sig = 0.000<0.05, so it can be concluded that the length of business significantly affects the differences in grades. Thus the level of business and the length of business play an important role in the rating disproportion regarding the openness of the company to creativity, new ideas and innovations.

For the relation between the level of business and the length of business of the company Sig. = 0.004<0.05, which indicates that there are significant differences in the evaluations of employees as a source of creativity and new ideas. Regarding individual influences, Sig for business level Sig. = 0.121>0.05, which means that the level of business of the company does not have a significant impact on employee ratings as a source of creativity and new ideas. For the length of business, the value Sig. = 0.083>0.05, so it is emphasized that the length of business does not significantly affect the differences in grades.

Finally, it can be stated that the variables level of business and length of business observed through their joint influence have a significant impact on the imbalance in the evaluations of employees as a source of creativity and new ideas, while the individual influence of the variables is negligible.

References

Almeida, R., & Fernandes, A. M. (2007). *Openness and technological innovations indeveloping countries: evidence from firm-levelsurveys*. Institute for the Study of Labor (IZA), Bonn.

Almeidaa, L., & Miguelb, P. (2007). *Managing new product development process: A proposal of a theoretical model about their dimensions and the dynamics of the process*. In: Loureiro, G., and Curran, R. (Eds), Complex systems concurrent engineering , (p. 239-246). London: Springer. Doi: https://doi.org/10.1007/978-1-84628-976-7_27

Bojovic, V., Pupovac, L., & Strugar, M. (2010). Understanding innovation drive of leading Serbian companies. *Perspectives of Innovations, Economics, and Business, 6*, 35-37.

Cruz-Ros, S., Garzon, D., & Mas-Tur, A. (2017). Entrepreneurial competencies and motivations to enhance marketing innovation in Europe. Psychology & Marketing, 34(11), 1031-1038. Doi: https://doi.org/10.1002/mar.21042

Djordjević, B. (2017). The evolution and development of the innovative organization, in *Management Entropy*, University "Union Nikola Tesla", Beograd, p. 11-24.

Janković, G., & Golubović, M. (2019). Open innovation in small and medium-sized enterprises. Ekonomika, 65(3), 89-101. Doi: https://doi.org/10.5937/ekonomika1903089J

Kicová, M. (2019). Enterprise's process innovations in the context of enterprise's financial performance. *Strategic Management, 24*(3), 3-13. Doi: https://doi.org/10.5937/StraMan1903003K

Liu, L., & Jiang, Z. (2016). Influence of technological innovation capabilities on product competitiveness. *Industrial Management & Data Systems*, *116*(5), 883-902. Doi: https://doi.org/10.1108/IMDS-05-2015-0189

Miletić, V., Ćurčić, N., & Miletić, S. (2019). Ocene ključnih faktora unapređenja poslovanja i marketing koncepta u domaćim organizacijama. *Vojno delo*, 2, 289-304, Doi: https://doi.org/10.5937/vojdelo1902289M

Miletić, V. (2020). *Leadership in a modern organization*. Niš: Ekonomika.

Nica, E., Manole, C., & Stan, C. I. (2018). A laborless society? How highly automated environments and breakthroughs in artificial intelligence bring about innovative kinds of skills and employment disruptions, altering the nature of business process and affecting the path of economic growth. *Journal of Self - Governance and Management Economics*, *6* (4), 25–30. Doi: https://doi.org/10.22381/JSME6420184

Perčić, K., Perić, N., & Kutlača, Đ. (2017). Acceptance of innovation in the form of internet media by consumers in the republic of serbia. Procedings of abstracts from Sustainable growth in small open economies, *IEEC*, pp. 247-250.

Palmberg, C. (2004). The sources of innovations–looking beyond technological opportunities. *Economics of Innovation and New Technology, 13*(2), 183-197. Doi: https://doi.org/10.1080/10438590410001628143

Rajković, T. (2015): *Osnovni elementi projekta inovacije proizvoda i procesa*. Inovativna rešenja operacionog menadžmenta za revitalizaciju privrede Srbije. X Skup privrednika i naučnika, p. 646-653.

Ružić Mosurović, M. (2012). *Organizacije i inovacije.* Beograd: Institut „Mihajlo Pupin".

Smith, D. (2010): *Exploring Innovation*. New York: McGraw-Hill.

Sokolov-Mladenović, S. (2020). Application of institutional innovation in trade: Experience of market-developed economies. *Ekonomika, 66*(3), 15-26. Doi: https://doi.org/10.5937/ekonomika2003015S

Stanković, L., Đukić, S., & Popović, A. (2014). Marketing innovations as source of enterprise's competitive advantage. Marketing, 45(4), 271-281. Doi: https://doi.org/10.5937/markt1404271S

Sternberg, R. (2000). Innovation networks and regional development—evidence from the European Regional Innovation Survey (ERIS): theoretical concepts, methodological approach, empirical basis and introduction to the theme issue. *European Planning Studies, 8*(4), 389-407. Doi: https://doi.org/10.1080/713666420

Vujičić, S., Ravić, N., & Nikolić, M. (2021). The influence of planning on the development of innovation in small and medium enterprises. *Trendovi u poslovanju, 9*(1), 78-83. Doi: https://doi.org/10.5937/trendpos2101078V

Vukajlović, Đ., Ćurčić, N. (2016). Ocena faktora konkurentnosti i inovativnosti u cilju ostvarivanja tržišnog učešća. *Ekonomija: teorija i praksa*, 9(3), 35-54.

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Intention to study digital marketing in the context of expected quality of a study program

Намера студирања дигиталног маркетинга у контексту очекиваног квалитета студијског програма

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Abstract: Measuring the quality in higher education can be performed on a more general level, usually by adjusting the instruments for measuring the quality of services in general, or through instruments that are related most directly to the study program. In any case, in methodological terms, one should keep in mind the relevant scientific knowledge regarding the treatment of a model that describes the relations of quality and its dimensions. In addition to appropriate theoretical observations, a primary marketing research was conducted in this paper, in order to determine whether and to what extent the expected quality of the study program affects the intention to enrol in it. In this particular case, students of the Faculty of Economics in Subotica (n = 89) evaluated (in June 2021) the expected quality of the master study program Digital Marketing (which is to start at this faculty in the forthcoming academic) and expressed their intentions to enrol in that program. Structural equation modelling was used. The results indicate that the expected quality positively and statistically significantly affects the intention to study the study program. The construct of the expected quality itself is statistically significantly formed by the dimensions of quality in the following order (according to the strength of the impact): Generic Skills, Good Teaching, Clear Goals and Standards, Appropriate Workload, and Appropriate Assessment.
Keywords: study program quality, quality dimensions, reflective-formative model, intention to study, digital marketing
JEL classification: M31

Сажетак: Мерење квалитета у високом образовању може се обавити на општијем нивоу, углавном прилагођавањем инструмената за мерење квалитета услуга генерално, или кроз инструменте који се односе најдиректније на студијски програм. У сваком случају, у методолошком погледу, треба имати у виду релевантна научна сазнања у погледу третирања модела који описује релације квалитета и његових димензија. У овом раду, поред одговарајућих теоријских опсервација, спроведено је примарно маркетинг истраживање са циљем утврђивања да ли и у којој мери очекивани квалитет студијског програма утиче на намеру уписа истог. У конкретном случају, студенти Економског факултета у Суботици (n=89) оцењивали су (у јуну 2021.) очекивани квалитет мастер студијског програма Дигитални маркетинг (који ће на

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наведеном факултету отпочети наредне школске године) и исказивали намере уписивања тог програма. Коришћено је моделовање структуралних једначина. Резултати указују да очекивани квалитет позитивно и статистички значајно утиче на намеру студирања студијског програма. Сам конструкт очекивани квалитет статистички значајно формирају димензије квалитета и то следећим редоследом (по јачини утицаја): генеричке вештине, добра предавања, јасни циљеви и стандарди, адекватно радно оптерећење и адекватно оцењивање.
Кључне речи: квалитет студијског програма, димензије квалитета, рефлективно-формативни модел, намера студирања, дигитални маркетинг.
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Introduction

In contemporary conditions, digital media are becoming an important part of everyday life (Vidaković & Vidaković, 2019) and, in business circumstances, internet advertising revenue can be measured in more than 100 billion of American dollars; for instance, 2019 it was 124.6 billion of American dollars (Internet Advertising Bureau, 2020). The need for digital marketing to become an academic discipline was also recognized in the literature for more than a decade ago (e.g. Wymbs, 2011).

However, when it comes to digital marketing as a study program, an important element of it, as in the case of other services, is its quality. The research of service quality is important in other areas as well, for example, in retail and hospitality (e.g. Tešić, 2020; Vujić et al., 2020). The quality of a study program or, more generally, the quality of a higher education institution is an important topic in the literature. Most of the research regarding institutions rely on adaptations of the famous SERVQUAL questionnaire for measuring service quality, but other instruments are being used as well (Brochado, 2009). On the other hand, there are instruments for measuring quality at the level of a certain study program (Richardson, 2005). Nevertheless, one should have in mind the relations of quality dimensions to quality, especially from the aspect of formative and reflective constructs in marketing research (Jarvis et al., 2003). Finally, service quality was previously brought in connection to behavioural intention in the field of higher education (Hwang & Choi, 2019).

The topic of this paper is to research the relations between expected study program quality and intention to apply for that program. In addition, the focus of the research are relations of study program quality dimensions, as the first-order constructs, and the quality, as the second order construct. In this particular case, students of the Faculty of Economics in Subotica (n = 89) evaluated (in June 2021) the expected quality of the master study program Digital Marketing (which is to start at the named faculty in the forthcoming academic year) and expressed their intentions to enrol in that program. The quality was set as the first-order reflective, second-order formative model. Structural equation modelling was implemented within the research.

Within the paper, after the literature review and model formulation, results and discussion are provided followed by conclusion. Beside special attention to methodological issues, according to the authors' knowledge, this is a novel approach in domestic higher education institutions and presents the practical application of marketing philosophy in that area, which is a relevant issue (Dragojlović et al., 2018).

1. The quality of a study program – theoretical background, methodological controversies, and model development

Brochado (2009) lists the most popular instruments used for measuring service quality in higher education. Firstly, there can be identified an instrument named service quality (SERVQUAL) which is based on gaps model and considers service quality as a difference between customer expectations (referring to beliefs about service delivery that present standards according to which performance is assessed) and performance perceptions (understood as subjective judgement of actual services experiences). This instrument consists of five dimensions (tangibles, reliability, responsiveness, assurance and empathy), which are measured through 22 items. When adapted to higher education area, those dimension relate to: in the case of tangibles – the appearance of the physical facilities of the higher education institution, its equipment, personnel, and communication materials; when it comes to reliability – the ability of the higher education institution to deliver the promised service dependably and accurately; as for responsiveness – the willingness of the higher education institution to help students and provide prompt service; in the case of assurance – the knowledge and courtesy of the teaching staff and their ability to convey trust and confidence; and when it comes to empathy – caring, individualized attention the higher education institution provides to its students.

Secondly, there is an instrument called service performance (SERVPERF). It actually presents a variant of SERVQUAL including only perception part of it, while excluding expectations. Thirdly, there can be identified an instrument known as higher education performance scale (Helper). It includes five dimensions (non-academic aspects, academic aspects, reputation, access, program issues), measured through 41 items. In this particular case, non-academic aspects relate to duties of non-academic staff, which enable students to fulfil their study obligations; academic aspects refer to responsibilities of the academics; reputation deals with the significance of higher education institutions in projecting a professional image; access is related to approachability, ease of contact, availability and convenience, while program issues refer to wide-ranging and reputable academic programs/specializations with flexible structures and health services.

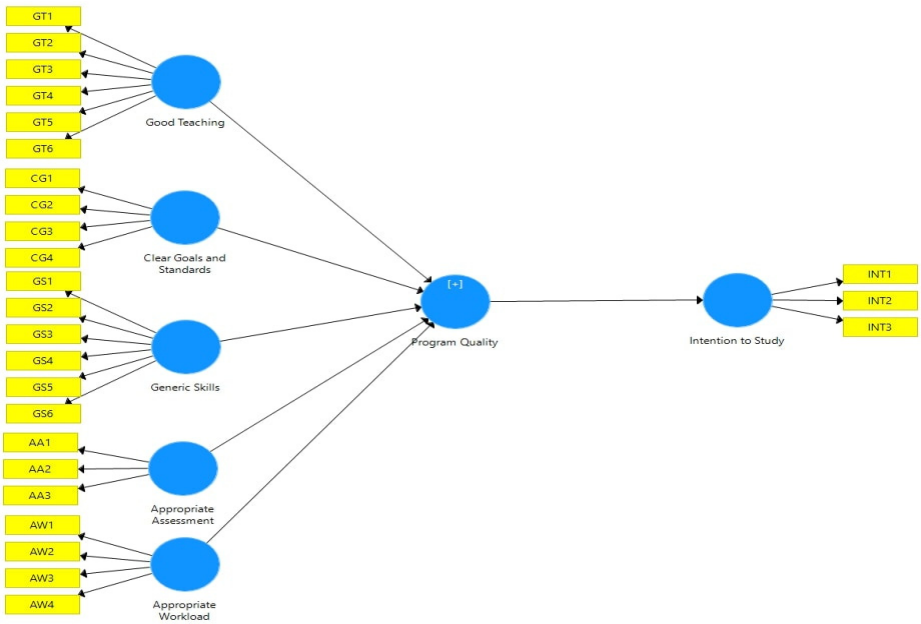
As for the quality of a certain study program, Richardson (2005) pays special attention to two instruments for its measuring: the Course Perceptions Questionnaire (CPQ) containing 40 items in eight scales reflecting different aspects of effective teaching (whose adequacy as a research instrument later raised certain doubts) and the Course Experience Questionnaire (CEQ) developed for monitoring the quality of teaching on certain academic programs. The CEQ has been used in a number of studies for measuring study program quality (e.g. Faranda et al., 2021). All the items and dimensions of its 23-item version, which is proven to have a stable factor structure equal to that of the 36-item full form (Wilson et al., 1997), are shown in Table 1 and used within the primary research in this paper.

Regardless of whether the instruments for measuring quality of the higher education institutions or study programs are observed, it can be seen that the quality is usually

conceptualized as second-order construct which "includes" certain dimensions, which are, on the other hand, measured through a number of individual items. The relation of those dimensions to quality, and of quality dimensions to their corresponding items, can be of special importance. For such a consideration, researchers can consult a body of literature providing the rules for determining whether the construct can be considered as formative or reflective. Jarvis et al. (2003) list four criteria in that sense: the direction of causality from construct to measure implied by the conceptual definition (from items to construct in formative model; from construct to items in reflective model); interchangeability of the indicators/items (do not need to be interchangeable in the formative model; should be interchangeable in the reflective model); covariation among the indicators (not necessary in formative the model; expected in the reflective model); and nomological net of the construct indicators (may differ in the formative model; should not differ in the reflective model). When considering the CEQ that is going to be used within this research, it can be concluded that it should be conceptualized as first-order reflective (describing the relations of quality dimensions and their corresponding items), second-order formative model (explaining the relations of quality and its dimensions).

Having all previously said in mind, as well as bringing service quality in the field of higher education in connection to behavioural intention in previous research (Hwang & Choi, 2019), the following model was conceptualized – see Figure 1.

Figure1: Research model



Source: the authors' own analysis

The results of testing that model will be presented in following parts of the paper.

2. Materials and methods

Structured interviews consisting of a questionnaire were used. The part of the questionnaire relevant for analysis presented within this paper consisted of two segments. The first part was related to measuring the quality of a study program. Since the master study program Digital Marketing is expected to start in academic year 2021/2022 and respondents were not able to have any experience with it, the formulations in the questionnaire were adapted to refer to the expected quality of the program (justification could be given for such a choice since the respondents are already students at the bachelor degree at the same faculty and are able to form expectations from their previous experiences). The measurement of a study program was done in accordance with the Course Experience Questionnaire CEQ23 (Wilson et al., 1997). The second part of the questionnaire referred to intention to study Digital Marketing master program at the Faculty of Economics in Subotica, University of Novi Sad. This construct was measured analogously to the construct Behavioural Intention, from the Theory of Planned Behaviour model, used for predicting students' study program choice (Taylor, 2014). All the items were assessed on five-point Likert scale (from "strongly disagree" to "strongly agree"). Back translation procedure was used. All the constructs and items can be seen in Table 1.

Convenience sampling was used. There were 89 students in the sample. In this case, 20.20% of them are male, while 79.80% are female. Furthermore, 21.30% of the respondents are attending the 1st, 18.00% are attending the 2nd, 25.80% are attending the 3rd, and 34.80% are attending the 4th year of the bachelor program. The research was conducted in June, 2021. The procedures applied are as described for reflective-formative model and structural equation modelling - SEM in Grubor, Djokic, Milicevic and Djokic (2021) (according to Becker et al., 2012; Hair et al., 2017; Hair et al., 2019). Prior to it, negatively-worded items (italic in Table 1) were recoded. Repeated indicator approach was used. Since all the first-order constructs are reflective, internal consistency reliability (by using alpha coefficient and composite reliability – CR), convergent validity (through individual indicator reliability and average variance extracted – AVE) and discriminant validity (by using Fornell–Larcker criterion) were examined. As for the second-order formative construct, collinearity was checked as well as contribution of all its dimensions to it (both, in the sense of their weights and significances). The effects of quality dimensions on Quality as well as it influence on Intention were analysed by using PLS-SEM path coefficients. The analysis was performed in SmartPLS3 software.

3. Results and discussion

The results of testing the instrument will be shown first, followed by the results of structural equation modelling.

Within testing the questionnaire, the results of testing the first-order constructs are presented at the beginning. Table 1 presents part of the results of testing the questionnaire – regarding internal consistency reliability and convergent validity.

Table 1: Testing the first-order constructs' internal consistency reliability and convergent validity

The first-order constructs and their items	Loadings	Alpha	CR	AVE
Good teaching		0.915	0.934	0.704
GT1: The teaching staff of that course will motivate students to do their best work.	0.898			
GT2: Staff there will put a lot of time into commenting on students' work.	0.718			
GT3: The staff will make a real effort to understand difficulties students might be having with their work.	0.875			
GT4: Teaching staff there will normally give helpful feedback on how we will be going.	0.882			
GT5: Our lecturers will be extremely good at explaining things to us.	0.808			
GT6: Teaching staff there will work hard to make subjects interesting.	0.841			
Clear goals and standards		0.887	0.922	0.747
CG1: It will always be easy there to know the standard of work expected.	0.824			
CG2: You will usually have a clear idea of where you will be going and what will be expected of you.	0.917			
CG3: It will often be hard to discover what is going to be expected of you in that course.	0.834			
CG4: The staff there will make it clear right from the start what they expect from students.	0.880			
Generic skills		0.962	0.969	0.841
GS1: That course will help me to develop my problem-solving skills.	0.914			
GS2: That course will sharpen my analytic skills.	0.930			
GS3: That course will help develop my ability to work as a team member.	0.892			
GS4: As a result of doing that course, I will feel more confident about tackling unfamiliar problems.	0.973			
GS5: That course will improve my written communication skills.	0.876			
GS6: That course will help me develop the ability to plan my own work.	0.914			
Appropriate assessment		0.716	0.840	0.637
AA1: To do well on that course all you will really need is a good memory.	0.792			
AA2: Staff will be more interested in testing what you will memorize than what you will understand.	0.755			
AA3: Too many staff will ask us questions just about facts.	0.846			
Appropriate workload		0.962	0.973	0.899
AW1: The workload will be too heavy.	0.975			
AW2: We will generally be given enough time to understand the things we will have to learn.	0.963			
AW3: There will be a lot of pressure on you as a student there.	0.940			

AW4: The sheer volume of work to be got through in that course will mean you will not be able to comprehend it all thoroughly.	0.913			
Intention to study		0.816	0.877	0.704
INT1: I intend to study Digital Marketing at the Faculty of Economics in Subotica.	0.881			
INT2: How likely is it that you will study Digital Marketing at Faculty of Economics in Subotica?	0.794			
INT3: I plan to study Digital marketing at the Faculty of Economics in Subotica.	0.839			

Source: the authors' research

As for internal consistency reliability, all alpha coefficients are above the threshold of 0.7, while most values of CR (composite reliability) are between 0.7 and 0.95 (the remaining two values are even higher than 0.95 and although in some of the cited sources it is not recommendable, in the others, that is an acceptable level). To assess convergent validity, standardized loading for each indicator was checked and all of them were higher than 0.7 as recommended; at the same time values of AVE (average variance extracted) were above 0.5, also as suggested.

The results of testing discriminant validity are shown in Table 2.

Table 2: Testing the first-order constructs' discriminant validity

The first-order constructs	Good Teaching	Clear Goals and Standards	Generic Skills	Appropriate Assessment	Appropriate Workload	Intention to Study
Good Teaching	0.839					
Clear Goals and Standards	0.349	0.864				
Generic Skills	0.351	0.487	0.917			
Appropriate Assessment	0.110	0.275	0.193	0.798		
Appropriate Workload	0.078	0.124	0.155	-0.035	0.948	
Intention to Study	0.170	0.139	0.470	-0.056	0.268	0.839

Source: the authors' research

The results show that each construct's square root of AVE is higher than its correlations with other constructs, which confirms discriminant validity.

The results relevant for testing the second-order construct are presented in Table 3. When it comes to collinearity, all VIF values are lower than 5, as recommended. In addition, the impact of three quality dimensions on the second-order construct is at $p<0.05$, while of the remaining two at $p<0.10$, which leads to conclusion that they all significantly contribute to the formation of the second-order construct.

Table 3: Testing the second-order construct

Constructs	VIF values	Path coefficient	p
Good Teaching → Expected Program Quality	1.198	0.340	0.000
Clear Goals and Standards → Expected Program Quality	1.444	0.247	0.000
Generic Skills → Expected Program Quality	1.401	0.606	0.000
Appropriate Assessment → Expected Program Quality	1.094	0.052	0.077
Appropriate Workload → Expected Program Quality	1.035	0.174	0.065

Source: the authors' research

Part of the results of SEM are already presented in the previous table for the purpose of testing the second-order construct. Although those results are to be repeated once again, all results of SEM are provided in Table 4.

Table 4: Results of the model

Constructs	Expected Program Quality		Intention to Study	
	Path coefficient	p	Path coefficient	p
Good Teaching	0.340	0.000		
Clear Goals and Standards	0.247	0.000		
Generic Skills	0.606	0.000		
Appropriate Assessment	0.052	0.077		
Appropriate Workload	0.174	0.065		
Expected Program Quality			0.422	0.000

Source: the authors' research

The results of SEM show that intention to study the Digital Marketing program is positively and significantly influenced by expected program quality. In addition, that quality is significantly influenced (at $p<0.10$) by each of its five dimensions (in the following order): Generic Skills, Good Teaching, Clear Goals and Standards, Appropriate Workload, and Appropriate Assessment. Furthermore, it should be noticed that the R^2 value of the model equalled 0.178 ($p=0.029$).

When translating the obtained results to managerial perspective, several conclusions should be taken into account. For the future students of Digital Marketing, the most influential dimension of the expected quality is related to developing their problem-solving skills, analytic skills, ability to work as a team member, confidence about tackling unfamiliar problems, written communication skills and ability to plan their own work. It is followed by the expected success of the teaching staff to motivate students to do their best work, to put a lot of time into commenting on students' work, to make a real effort to understand difficulties students might be having with their work, to give helpful feedback on how students are progressing, to explaining things extremely well, and to make subjects interesting. On the third place by importance for the students is to be familiar with the expected standard of work, to have a clear idea of where they will be going and what will be expected of them, and these must be made clear by the staff from the start. Appropriate workload and assessment, as already suggested, are less important than previously listed issues.

Conclusion

Marketing philosophy can be embraced, not only by companies, but by higher education institutions as well. On the level of particular programs those institutions offer, the research of the quality of existing programs or expected quality of the upcoming programs can be a valuable part of implementing that philosophy. The instruments for measuring the quality on that level (as well as the level of the whole institution) are already developed and implemented in similar research, but should be exploited with caution in the context of important methodological considerations related to it.

In this paper, the students of the Faculty of Economics in Subotica (n = 89) evaluated (in June 2021) the expected quality of the master study program Digital Marketing (which is to start at the named faculty in the forthcoming school year) and expressed their intentions to enrol in that program. The results show that intention to study Digital Marketing program is positively and significantly influenced by the expected program quality. Furthermore, that quality is significantly influenced (at $p<0.10$) by each of its five dimensions (in the following order): Generic Skills, Good Teaching, Clear Goals and Standards, Appropriate Workload, and Appropriate Assessment.

Beside scientific contribution in regard to methodological issues, the results of the research can be important for the management of the institution as well as for the teaching staff that will be engaged in Digital Marketing master study program. Future considerations should include additional potential influential factors and should try to reach interested students outside the institution that would like to apply to that program. The measurement of the perceived quality after the first year of the program has finished is also recommendable.

References

Becker, J., Klein, K., & Wetzels, M. (2012). Models in PLS-SEM: Guidelines for using reflective-formative type models. *Long Range Planning, 45*(5-6), 359-394. Doi: https://doi.org/10.1016/j.lrp.2012.10.001

Brochado, A. (2009). Comparing alternative instruments to measure service quality in higher education. *Quality Assurance in Education, 17*(2), 174–190. Doi: https://doi.org/10.1108/09684880910951381

Dragojlović, V., Mihailović, B., & Novaković, S. (2018). Marketing activities for the purpose of marketing culture development in education and educational institutions. *Ekonomika, 64*(4), 135-146. Doi: https://doi.org/10.5937/ekonomika1804133D

Faranda, W. T., Clarke, T. B., & Clarke, I. (2021). Marketing student perceptions of academic program quality and relationships to surface, deep, and strategic learning approaches. *Journal of Marketing Education, 43*(1), 9-24. Doi: https://doi.org/10.1177/0273475320939261

Grubor, A., Djokic, N., Milicevic, N., & Djokic, I. (2021). *Marketing istraživanje (Marketing research).* Subotica: Ekonomski fakultet u Subotici

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt., M. (2017). *A primer on partial least squares structural equation modelling (PLS-SEM)*. Thousand Oaks: Sage Publications.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review, 31*(1), 2-24. Doi: https://doi.org/10.1108/EBR-11-2018-0203

Hwang, Y.-S., & Choi, Y. K. (2019). Higher education service quality and student satisfaction, institutional image, and behavioural intention. *Social Behaviour and Personality: An International Journal, 47*(2), 1–12. doi: https://doi.org/10.2224/sbp.7622

Internet Advertising Bureau. (2020, May). *Internet advertising revenue report – Full year 2019 results & Q1 2020 revenues*. Retrieved July 28, 2021, from https://www.iab.com/wp-content/uploads/2020/05/FY19-IAB-Internet-Ad-Revenue-Report_Final.pdf

Jarvis, C. B., MacKenzie, S. B., & Podsakoff, P. M. (2003). A critical review of construct indicators and measurement model misspecification in marketing and consumer research. *Journal of Consumer Research, 30*(2), 199-218. Doi: https://www.jstor.org/stable/10.1086/376806

Richardson, J. T. E. (2005). Instruments for obtaining student feedback: a review of the literature. *Assessment & Evaluation in Higher Education, 30*(4), 387–415. Doi: https://doi.org/10.1080/02602930500099193

Taylor, R. C. (2014). Using the theory of planned behaviour to understand students' subject choices in post-compulsory education. *Research Papers in Education, 30*(2), 214–231. Doi: https://doi.org/10.1080/02671522.2014.880732

Tešić, D. (2020). Measuring dimensions of service quality. *Strategic Management, 25*(1), 12-20. Doi: https://doi.org/10.5937/StraMan2001012T

Vidaković, M., & Vidaković, D. (2019). Digital media, creativity, and marketing, within the scope of the contemporary instant culture. *The Annals of the Faculty of Economics in Subotica, 55*(41), 131-144. Doi: https://doi.org/10.5937/AnEkSub1941131V

Vujić, M., Sekulić, D., & Cvijanović, D. (2020). The importance of intangible elements in the assessment of service quality in hotels in Kolubara District. *Menadžment u hotelijerstvu i turizmu, 8*(2), 43-52. Doi: https://doi.org/10.5937/menhottur2002043V

Wilson, K. L., Lizzio, A., & Ramsden, P. (1997). The development, validation, and application of the course experience questionnaire. *Studies in Higher Education, 22*(1), 33-52. Doi: https://doi.org/10.1080/03075079712331381121

Wymbs, C. (2011). Digital marketing: The time for a new "academic major" has arrived. *Journal of Marketing Education, 33*(1), 93-106. Doi: https://doi.org/10.1177/0273475310392544

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Analysis of credit indebtedness of public companies founded by the City of Loznica

Анализа кредитне задужености јавних предузећа чији је оснивач град Лозница

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Abstract: In contemporary business conditions, that is, in a market economy, business success of a company has to be based on a basic economic and business principle of accomplishing the best possible business results with as little investments as possible. Considering that public utilities carry out public interest activities and employ a large number of people in Serbia, a need emerges to analyze their current status. The goal of this business analysis is to find out appropriate ways of improving public utilities business, including the improvement of the entire public utilities sector in Serbia. The subject of this paper is the analysis of indebtedness of public utilities on the territory of the city of Loznica. Special attention is paid to enterprises that have long-term liabilities in their business. The aim of this paper is a realistic presentation of the indebtedness of public utilities whose founder is the City of Loznica. The amount of indebtedness of local companies is compared in relation to the average indebtedness of public companies from the territory of the Republic of Serbia and the Mačva District. The City of Loznica has established five public companies, with three public companies performing communal activities. The paper will use the ratio analysis of financial indicators. The business operations of the utilities in the period from 2017 to 2019 will be analysed. In addition, the aim of this paper is to present alternative sources of financing for public utilities, which companies can use in case of facing financial problems. The research established that public utilities in Loznica do not have high long-term liabilities, but that this is not the case with other public utilities in Serbia.
Keywords: public companies, financial analysis, ratio indicators, indebtedness.
JEL classification: G20, G28, H41

Сажетак: У савременим условима пословања, у условима тржишне економије, пословни успех предузећа мора се заснивати на основном економском и пословном начелу остварења што бољих пословних резултата уз што мање улагање. С обзиром да локална јавна предузећа обављају делатност од општег интереса и да упошљавају велики број грађана Србије, јавља се потреба за анализом њиховог тренутног стања. Циљ анализе пословања свакако јесте проналажење одговарајућих начина за побољшање њиховог пословања, а самим тим и унапређење укупне области јавних предузећа у Србији. Предмет овог рада јесте анализа задужености јавних предузећа на територији града Лознице. Посебан осврт је на предузећа која у свом пословању бележе високе дугорочне обавезе. Циљ рада јесте реалан приказ задужености јавних предузећа чији је оснивач Град Лозница. Упоређује се висина задужености локалних предузећа у односу на просек задужености јавних предузећа са територије Републике Србије и мачванског округа. Град Лозница, основао је пет јавних предузећа, с тим што три јавна предузећа обављају комуналну делатност. У оквиру рада користиће се рацио анализа финансијских показатеља.

Анализира се пословање предузећа у временском периоду од 2017. до 2019. године. Осим тога, циљ рада јесте и приказивање алтернативних извора финансирања јавних предузећа, које предузећа могу искористити у случају суочавања са финансијским проблемима. Истраживањем је утврђено да јавна предузећа у Лозници немају високе дугорочне обавезе, али да то и није случај са осталим јавним предузећима у Србији.
Кључне речи: јавна предузећа, финансијска анализа, рацио показатељи, задуженост.
ЈЕЛ класификација: G20, G28, H41

Introduction

With regard to the significance of the objectives set before public entities and nature of the work they perform it is required to know the organizational structure of the entity, that is, all aspects of good governance and management. With the analysis of all aspects of business operations it is possible to perceive to what extent a company is capable to accomplish defined goals of its existence. A statement is often drawn that public companies represent nowadays a break on further progress of Serbia, that they are prone to producing only losses, making a burden for the state or local self-government budget. In order to know the real state of play in public entities it is necessary to analyze all segments of business operations and functioning of a company in accordance with the fact that only with analytical approach real situation and potential, which public companies in Serbia are disposed of, a conclusion can be reached. Most often activity entrusted to public companies in Serbia is utility activity; however, there are also other fields of activities performed by the public entities.

According to Kaplan & Norton, 1996: "When designing a system for measuring performance, both financial and non-financial indicators are taken into account". An effective system for measuring performances enables a company to control, monitor and measure its accomplishments in accordance with a defined strategy adequately and promptly (Domanović, 2013). Financial analysis represents a financial management tool which covers a company's financial performance evaluation (Fabozzi & Peterson, 2003). It involves researching past and present financial data in order to evaluate performance and assess future risk and potential (Shim, 2008). Business efficiency, customer and employee satisfaction resemble non-financial indicators, which are not possible to represent using quantitative units of measure. We can present financial indicators in the form of ratio numbers, i.e. relation between two or more economic values. Neely, Gregory & Platts, (1995) point out: "Indicators for measuring performance represent a set of metrics, which enables quantitative measuring of efficiency and effectiveness". Performance appraisal through financial statement analysis is based on past data and conditions from which it is not easy to extrapolate future expectations. However, any decision made based on such a performance assessment can only have an impact on the future (Helfert, 2001). Different views can be found in literature in the definition, significance, and categorization of individual ratios (White et al., 2003). In the basic financial indicators of a company, we can classify indicators of profitability, economy, cost efficiency, indebtedness, and liquidity.

1. Literature review

Each book that deals with ratio analysis contains a different set of ratios, or at least a seemingly different set, primarily because financial indicators appear under different names, calculation methods, and definitions. In this regard, there are as many classifications as there are authors who deal with this analysis.

Also, there is not a uniquely accepted ratio list, nor a standard method of its calculation. During the research, we can encounter variations both in terms of selection and in terms of their method of calculation (Atrill, 2006). The concepts and terminology themselves are not of a universal character and definition (Stead, 1995). Atrill (2006) points out that the financial ratio is the most important ratio when analysing the business of a company. This author points out the significance of its usage during examination of different aspects of financial positions and performance of a single company. In addition, its application is important in long-term planning and control. Financial ratios are used to compare the risks and returns of different companies, all with the goal of making smarter decisions (White et al., 2003). Evans (2000) points out that monitoring the value of financial ratios is the basis for forming an optimal business system in a company. Ratio analysis is one of the most important financial analysis tools. This analysis is considered to be the most popular and most widely used during the analysis of the company's financial performance (Berstein & Wild, 1999). Many empirical studies have shown that ratio analysis directs company management toward achieving long-term goals and assists in short-term decision-making (Walsh, 2008). The ratio analysis of current and past performance of companies provides a basis for predicting future performance, which is a necessary starting point for further financial considerations of the company (valuation, credit analysis, merger analysis and acquisition) (Palepu et al., 2004). Eliott & Elliot (2006) point out that financial ratios identify irregularities, anomalies and surprises which require further examination in order to evaluate the financial position of a company. Erić (1992) claims that for one company it is extremely important to choose adequate sources of financing and that the choice of one source entails a large number of mutual factors that can affect the further business of the company (Erić, 2003). The most developed organizational systems have the best funding mechanisms (Mishkin & Eakins, 2006). Elia (2006) points out that long-term sources of financing can leave significantly bigger consequences to the business of a company. Every company management should strive to establish an optimal structure for the use of borrowed and own funds (Damodaran, 2001; Kaplan & Anderson, 2007; Fleisher & Bensoussan, 2000; Brealey et al., 2010).

2. Methodology and data

The forthcoming analysis deals with determining the level of indebtedness of public utilities whose founder is the city of Loznica. By calculating the debt ratio for each observed company, we want to show which companies have potential problems with high debts. The data used in calculating these ratios were taken from the balance sheets and income statements of public enterprises. During the analysis, the remarks made in the

Independent Auditor's Report were also taken into account. The analysis covers the period of three years from 2017 to 2019. Data used in the analysis was taken from the website of Agency for Business Registers. In addition, for the purposes of comparative analysis of the city of Loznica with other municipalities, data from the website of the Republic Secretariat for Public Policies was used. When calculating the mentioned ratios, the methodology explained in the book *Analysis of Financial Statements* (Rodić et al., 2017) was used. In the listed literature, each debt ratio is defined individually, with an indication of the way in which each of them is calculated. For a comparative analysis of the indebtedness of public companies in the city of Loznica in relation to other local governments, the calculation methodology displayed on the website of the Republic Secretariat for Public Policies, defined by the Ministry of Finance of the Republic of Serbia, was used.

3. Strategic approach of providing financial resources as an important factor for business of a company

Financing is an important factor ensuring survival and efficiency of business in every company. The importance of adequate sources of financing is not in question even when it comes to public entities. Public entities, just as any other entity, have a need for investing in human capital, new facilities, new equipment, providing new services and everything is conditioned by the possibility of a company to satisfy the needs for adequate sources of financing. The choice of right sources of financing for every entity represents a very important question and decision on the manner in which some capital entrepreneurship will be financed or some facility has a strategic significance for the management of an entity (Erić, 1992).

Financing certainly represents one of the biggest problems faced by public entities in Serbia. In most cases, the decision on financing entails a series of other decisions, both financial and business ones (Erić, 2003). With regards to the high level of interdependence and conditionality among different types of decisions, on the occasion of making decisions, at least two economic areas emerge and intersect (financial and strategic management). Only developed systems have adequate and well-developed mechanisms of indirect financing (Mishkin & Eakins, 2006).

A special problem with public entities is that there often emerges a need for financing new investments that companies cannot meet on their own (Erić et al., 2011). In the very approach of classifying different sources of financing, some general division of sources of financing is to short-term and long-term sources. Short-term sources of financing are those sources that by definition have maturity period less than a year (payables due to suppliers, short-term loans, issued short-term securities, etc.). Long-term sources of finance have a greater significance for a public company according to the fact that they can have a significantly higher impact on the liquidity and long-term financial stability of a company. Not only do they affect financial stability of a company, but they also maintain the structure of a company's capital (Elia, 2006).

In practice, loaned resources should have lower expenditures, but it has to be taken into account that the very quantity of resources is linked to creditworthiness of an entity, which entails a higher degree of risk that the resources will not be returned in the agreed time frame with previously defined reimbursement. Every entity's management should set up an optimum level of using loaned and their own resources, comprising and analysing financial capacity and the ability of the entity (Damodaran, 2001). The important factor in making investment decisions of an entity's management is the level of average weighted capital costs. What should be mentioned is a modern model of costs management on the bases of activities, which implies costs allocations by activities and also monitors costs movements per individual activity or a part of production process and allocates them based on certain time equations (Kaplan & Anderson, 2007). In the process of identifying model of costs management, we should take care of the information spectrum of a method, focus and the volume of tasks, as well as information, organizational and other resources of the management process (Fleisher & Bensoussan, 2000). If we look at previously mentioned optimal structure of a capital, based on which a company establishes optimum structure of its own and loaned sources of resources, in theory, it is established in a situation when the capital costs are at the lowest possible level. Although it is more about theoretical and not about practical concept, calculating this indicator can represent an important factor on the occasion of determining adequate sources of financing an entity. In order to determine average weighted costs of a capital it is necessary to be aware of each and every source of finance, as well as their proportion during their usage (Brealey et al., 2010).

4. Analysis of financial statements – ratio analysis

In order for an enterprise to efficiently govern itself, it is necessary to calculate goals for a certain time period. The inability to measure certain performances would mean to some extent wandering in the dark, without indications of clear problems in the company's operations. One way to establish an appropriate system based on financial performance measures is to use ratio analysis (Evans, 2000).

Ratio is a mathematical relation between two values, and financial ratio is a relation between two financial positions (Fabozzi & Peterson, 2003). The ratio simply relates one position of the financial report to another position or to some business resource (Evans, 2000). Ratio analysis gives information about a certain situation in which certain enterprise finds itself (Bernstein & Wild, 1999). The choice of specific ratio indicators directly depends on the strategy implemented by one company (Hagos & Pal, 2010). By relating certain positions in financial statements, a large number of ratios can be calculated, but the point is to know which ratio provides which information (Elliot & Elliot, 2006). By calculating certain number of ratios it is often possible to get good picture about financial positions and performance. Ratios are what can indicate financial strengths and weaknesses, and that is why they are often used by those interested in the company's business and performance (Atrill, 2006). The information that can be obtained by calculating the mentioned ratios refers to the company profile, economic characteristics, competitive strategies and unique financial and investment characteristics (White et al., 2003).

Steps which are needed to be done during the ratio analysis creation are (Bernstein & Wild, 1999):

- defining analysis goals explicitly;
- formulating specific questions and criteria;
- identifying the most effective and the most efficient indicators;
- results interpretation.

The usefulness of the obtained values of the ratio indicators depends directly on the business aspects of the company which is the subject of examination (Elliot & Elliot, 2006). Three key factors influence the value of ratio indicators, and they should be taken into account when interpreted (White et al., 2003). The first factor is strategy management. An enterprise can decide to implement the strategy: high turnover / low margin or low turnover / high margin. Choosing one of these strategies can affect the values of certain financial indicators. The second important factor is the characteristic of the activity in which one enterprise is engaged. The values of individual indicators are also influenced by the characteristics of the activity in terms of competitiveness (Selling & Stickney, 1989). Life cycle of a product is the third important factor which can affect the value of ratio indicator. It was found that in the inception phase, the company has high activity indicators, but low liquidity, profitability and solvency indicators (Savič & Thomson, 1978).

Ratios become important analysis tool for enterprise performance when they are compared to (Shim, 2008):

- values of the same ratio for the same enterprise in the past;
- some predefined standard;
- ratio of other enterprises from the same industry;
- ratios for the business in which enterprise operates.

5. Content of ratio indicators of indebtedness of observed public entities, empirical analysis and discussion

When analysing financial indicators, it should be borne in mind that all financial indicators have many common elements, because they are all derived from the elements of financial statements. They are often interconnected and can be viewed as a system (Helfert, 2001). Level of indebtedness of public utilities founded by the city of Loznica will be considered in the upcoming analysis. In order to consider the level of indebtedness of public utilities, it is necessary to analyze the following 4 indicators of indebtedness for all observed public utilities (Rodić et al., 2017):

1. financial leverage;
2. coefficient of their own financing;
3. indebtedness factor;
4. indicator of the independence of financing.

Indebtedness indicators can be viewed as indicators of business security. The reason for calculating and analysing these four indebtedness indicators is to determine business

security of the public enterprises in the period from 2017 to 2019. By presenting possible high values of certain indicators, the potential problems that companies have with the amount of debt would be pointed out. Financial leverage represents the ratio of total sources of fund and own sources. The financial leverage ratio measures the riskiness of investing in a company and is an indicator of possible corporate borrowing. Financial leverage speaks to how large a company's asset base in comparison to its own capital. It is also called the equity multiplier (Fabozzi & Peterson, 2003). Financial leverage allows a company to own more than the value of its equity. It can directly affect the increase in the rate of return on the company's own funds, as long as the price of borrowed capital is lower than the return that this capital brings (Palepu et al., 2004). As a rule, the company should strive to keep this coefficient as low as possible. The larger the share of funds financed by equity, the lower the financial leverage (Bernstein & Wild, 1999).

Ratio of self-financing shows percentage share of a company's own capital in its total business operations. Referential value of this indicator is 0.5 and higher, which means that this ratio should not be less than 0.5. If the value of this indicator is 0.5, then the share of self-financing in a company is 50%. Value of this indicator is in a direct relation with degree of risk for investing a certain enterprise (a higher value of this ratio is desired). This ratio has broad application in corporate finances and is used as a test of financial strength and a position of an enterprise (Marr, 2012). High value of this ratio is especially problematic for enterprises which have cash flow problem, especially in crises (Shim, 2008).

Indebtedness factor measures the relationship between liabilities and money flow and shows how many years it would take to settle all debts with the use of realized money flow, with the assumption of restraining from investments and sharing the gain. Referential value is 5 years, which means that an entity is facing huge debts if it succeeds in settling liabilities in defined deadline. The essence is in a good balance of debt and equity use, so that profit is maximized, while managing risk (Evans, 2000).

The indicator of the independence of financing measures the ratio of own and other's sources in the in the total sources of financing. According to traditional rule of financing, this ratio should be 50% of own and 50% of other's sources of financing. According to organic composition of capital, this ratio should be 60% of own and 40% of others' capital. Creditors usually look at this indicator when deciding whether to approve long-term funding sources (Bernstein & Wild, 1999).

In the literature of a business analysis and measuring of an entity's efficiency, based on financial reports, a prominent place is taken up by the instruments of financial analysis. Kothari & Barone (2012) emphasize "three basic tools (instruments) of financial analysis: (1) horizontal analysis (report on trends); (2) vertical analysis, and (3) financial indicators ". Horne & Wachowich (2007) state: "In order to assess financial state of play and success of an entity's business, financial analyst has to check various aspects of corporation's health. An instrument that is often used during these checks is financial ratio or index, which connects two financial data by dividing one quantity by the other ".

The analysis comprises business operations of five public companies, the founder of which is the city of Loznica, in the time period between 2017 and 2019:

1) Public utility company "Water Supply and Sewerage" – Loznica;
2) Public utility company "Our Home" – Loznica;
3) Public utility company for the production and distribution of thermal energy "Heating Plant" – Loznica;
4) Public company "Loznica Development" – Loznica;
5) Public utility company "Parking Service" – Loznica.

Table 1. Indebtedness indicators – Public utility company "Water Supply and Sewerage" – Loznica (2017-2019)

No.	Ratio indicators of indebtedness	2017	2018	2019
1.	Financial leverage	1.3991	1.3872	1.2228
2.	Ratio of self-financing	0.417989	0.428754	0.448270
3.	Indebtedness factor	16.8871	13.0374	11.6793
4.	Indicator of financing independence	0.4168	0.4283	0.4499

Source: Calculation and layout of the author based on the data of the Business Registers Agency

Financial leverage ratio does not have a specifically defined referential value, but it is pointed out in literature that an enterprise should have low value of this ratio. If we look at the value of this ratio at "Water Supply and Sewerage" PUC, we will see that the value decreases from year to year. However, the very value of this ratio is problematic, and the key reasons are high debts this company faced in the period between 2017 and 2019. Based on the gained value of the coefficient of self-financing we can notice that its value increases over years. However, the key reason for the increase in the values of this indicator is not the increase in the basic capital but the decrease in the value of total assets. Since the value of the ratio in all three observed years is below 0.5, we can conclude that the risk degree for investing in this entity is at a high level. The value of indebtedness factor with observed entity is significantly above the defined referential value. The key reasons for this are high debts the entity is facing. It should be noted that observed entity got into a credit debt in 2008 and that the loan principal repayment is still in progress, as well. The good thing for the entity is that this rate gets reduced over years and the key reason for this is that the entity succeeds in continuously reducing the total liability. Based on obtained values of indicators of financing independence we can see that the entity is financed with more than 50% from others' sources, which is not a good indicator for this entity. A good fact is that this indicator marks an increase of values over years, primarily all owing to the increase in their own sources.

Table 2. Indebtedness indicators – Public utility company "Our Home" – Loznica (2017-2019)

No.	Ratio indicators of indebtedness	2017	2018	2019
1.	Financial leverage	0.1695	0.1717	0.1780
2.	Ratio of self-financing	0.791434	0.793163	0.746430
3.	Indebtedness factor	1.3493	1.4344	1.3442
4.	Indicator of financing independence	0.8550	0.8535	0.8489

Source: Calculation and layout of the author based on the data of the Business Registers Agency

Financial leverage with this observed entity is significantly lower in comparison to the previous entity. The key reason for it is that this entity does not have high debts. By observing the very structure of the entity's debt it can be seen that short-term liabilities prevail, which indicates that the entity does not have high credit indebtedness. Negative phenomenon is that the values of this indicator in the observed period increase and the reason for it is a mild increase in total liabilities of the entity. With the observed entity, equity is dominant in the total business of the company with more than 75%. When this indicator is observed, the attention should be paid to the decrease in value in 2019 in comparison to 2017 and 2018, and it should be noted that the reason for this decrease is the enlargement of the total assets in analysed year. The indebtedness factor of this entity is significantly below the referential value. This indicator tells us that the entity has the ability to settle its obligations for less than a year and a half. The indicator of financing independence is above the referential value, which indicates that, in the total source of financing, own sources used by the entity dominate with 85% in 2017 and 2018. In 2019, a mild decrease in the value of this indicator was marked.

Table 3. Indebtedness indicators – Public utility company "Heating Plant"– Loznica – Loznica (2017-2019)

No.	Ratio indicators of indebtedness	2017	2018	2019
1.	Financial leverage	2.2613	2.4782	2.4220
2.	Ratio of self-financing	0.303310	0.316220	0.308430
3.	Indebtedness factor	18.8862	85.4916	27.7277
4.	Indicator of financing independence	0.3066	0.2855	0.2922

Source: Calculation and layout of the author based on the data of the Business Registers Agency

The analysed entity in observed time period marks significantly high values of the coefficient of financial leverage. The reason for it is that the entity marks significantly high total liabilities in the observed period of time. If the structure of obligations is observed, it can be seen that first of all short-term liabilities dominate, such as liabilities due to suppliers. Coefficient of its own financing is at an extremely low level. Even though its value increased slightly in 2018 and 2019, there is another drop in the value of this indicator. With the observed indicator, the attention should be paid to the report of an independent auditor, who indicates the need of repeated assessment of the entity's capital. The highest factor of indebtedness with public utility company "Heating Plant" is marked in 2018. The reason for extremely high value of this indicator in that year is the loss faced by the entity. The entity managed to recover from the loss and in 2019 it operates with profit of 12,861,000.00 dinars, which affected the drop in this indicator at the same time. In 2018 and 2019, the entity was financed with less than 30% from its own sources of financing. Such low value tells us that the entity has big problems in the structure of its own and other sources and that the risk of investment in observed entity is extremely high.

Table 4. Indebtedness indicators – Public utility company "Parking Service" – Loznica

No.	Ratio indicators of indebtedness	2017	2018	2019
1.	Financial leverage	0.0431	0.0398	0.0271
2.	Ratio of self-financing	0.317038	0.273913	0.258371
3.	Indebtedness factor	0.0614	0.0535	0.0360

4.	Indicator of financing independence	0.9587	0.9617	0.9736

Source: the author's calculation and layout based on the data of the Business Registers Agency

If we perceive the total debts the entity had in the period between 2017 and 2019, we can see that the entity does not have problems with repayment of short-term and long-term liabilities. Based on that, the entity marks extremely low values of the coefficient of financial leverage, with continuous drop in its value over years. As for ratio of self-financing, the analysed entity's own financing is below defined referential value. It is important to emphasize that the reason for such a low value of observed ratio in the basic capital, which is 5,000,000.00 dinars (it does not change in the observed period). Of course, on the occasion of this particular analysis what should be taken into account is the field of activity the entity is involved in. Like financial leverage, indebtedness factor is also at an extremely low level indicating that the entity can settle its liabilities from the money flow in less than a month. The indicator of the financing independence is at an extremely high level, which is to a certain extent a rare phenomenon when it comes to a public entity. In the total financing sources, own sources are dominant, exceeding 95%.

Table 5. Indebtedness indicators – Public company "Loznica Development – Loznica

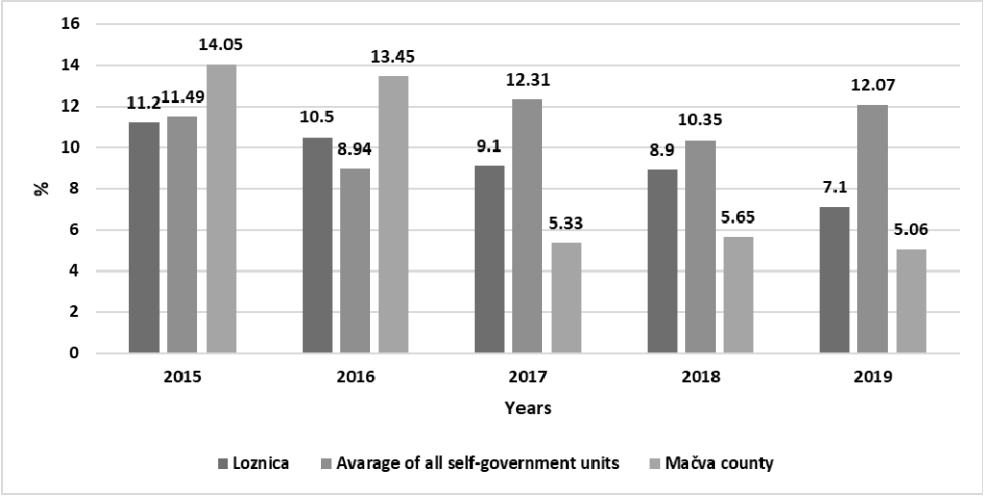
No.	Ratio indicators of indebtedness	2017	2018	2019
1.	Financial leverage	0.0549	0.1984	0.1272
2.	Ratio of self-financing	0.786593	0.732866	0.709458
3.	Indebtedness factor	0.3782	0.9198	0.5951
4.	Indicator of financing independence	0.8928	0.9172	0.8872

Source: the author's calculation and layout based on the data of the Business Registers Agency

Based on the received values of financial leverage in the observed year, we can conclude that the entity, as well as the previously analysed, has a possibility of indebtedness (due to low liabilities). The risk of investment in observed entity is at a low level and the debt principal gets reduced in years. The value ratio of self-financing in all three years tells us that in the entity, its own capital is dominant in the total business of the entity with more than 70%. The drop of this indicator was marked in 2018 and 2019 in comparison to 2017, primarily due to the drop in value of the total assets of the entity. The value of the indebtedness fluctuates over the observed period of time. The highest value was marked in 2018, when there was a leap in total liabilities in comparison to 2017 with a slight drop in retained earnings. The good fact is that the value of the indicator dropped in 2019, that is, the entity managed to settle a part of short-term and long-term liabilities. The entity finances its operations with more than 85% from its own sources of financing. The entity marks an increase in the value of this indicator in 2018 in comparison to 2017, so that in 2019 there would be another drop in value of this indicator to 88%.

For a more comprehensive comparative analysis of the indebtedness of public utility companies from the territory of the city of Loznica, in comparison to public utility companies of local self-governments units, net debt indicator/EBITDA is taken into account.

Graph 1. Comparison of net debt/EBITDA of public utility companies on the territory of the city of Loznica in the period between 2015 and 2019 with the average of all self-government units and the average of Mačva District



Source: the author's calculation and layout based on the data of the Republic Secretariat for Public Policy

The indicator represents the ability of an entity to settle its credit liabilities from its own resources. It should be less than 5, which clearly means that public utility companies can settle their liabilities from their own resources in 5 years. (Long-term liabilities + short-term liabilities – cash equivalents and cash) / (Profit before tax + Interest expenses (to third parties) + depreciation costs). Net debt / EBITDA ratio measures the ratio of a loan taken that is not covered by cash and marketable securities of the company and equity. Net debt shows the level of debt at which a company remains burdened after all liabilities have been disbursed using liquid assets (Wiehle, Diedelmann, Deter, Schomig & Rolf, 2006). The lower the value of this indicator, the more the financial security and stability of an enterprise. Higher value represents a higher degree of indebtedness and lower coverage of this debt by enterprises liquid assets. The negative value of the indicator indicates the low total indebtedness covered by the company's liquid assets. The aim of calculating this indicator is to consider the level of net debt of public companies from the territory of the city of Loznica in relation to the average of other municipalities. The value of stated indicator was below the average of public entities of all units of self-government in 4 out of observed 5 years. By observing the whole period, public utility companies on the territory of the city of Loznica can settle their liabilities from their own sources in the period of 9.3 years. Declining trend over the years represents a positive phenomenon.

Conclusion

Prior to drawing the conclusions, it is necessary to stress that each economic and financial analysis has its own flaws. According to Chondhry, 2006, the most important limitations in the implementation of ratio analysis are: various accounting techniques can call into questions the comparison of values of certain ratio, that is, it can be a problem caused by inflation that affects financial reports (depreciation of values of many positions in financial reports) negatively; certain entities are decentralized or divisionally structured, which makes it difficult to calculate branch average as a basis for comparison; a certain number of companies want to have better indicators than the branch average, so that linking to average indicators of ratio analysis does not always have to be a good comparison; when of comparing the same ratios in the same company, changes and circumstances that can occur in the period of observed analysis can be taken into account; in the case of analysis, there occurs a dilemma on which ratio is acceptable and which is not. Based on the results of carried out research it could be noticed that the problem is with high indebtedness of public utility company "Water Supply and Sewerage" and public utility company "Heating Plant". The reason for high indebtedness of public utility company "Water Supply and Sewerage" lies in credit indebtedness of the company in 2008, the repayment of which will last for the next 4 years. Unlike this company, high debts of public utility company "Heating Plant" are the reason for "tails" that the company entails from the previous period and are linked to unsettling liabilities based on obtained gas. Accordingly, more detailed analysis of the business operations of this entity is needed, including and analysing business operations of the entity in a longer period of time. The remaining three observed entities, based on the values of obtained indebtedness indicators, do not have major problems with total liabilities. When analysing indicators, which, when calculated, take into account the value of the basic and their own capital at the disposal of observed public entities, attention should be paid to the report of an independent auditor (from 2017 to 2019). The auditing report points to mismatch of the value of the entity's basic capital and the value enlisted in the Business Registers Agency, stressing that the real value of all three entities is significantly above this one enlisted in the Business Registers Agency. Besides the analysed indebtedness and shown problems with the view of values of these indicators with the majority of public utility companies in Serbia, each of the analysed companies is facing other specific problems arising from the nature of their field of activity and from inherited difficult situation (technical and technological obsolescence, irrational consumption, high budget dependence, many companies oversized, staff issues etc.).

References

Agencija za privredne registre. Retrieved 01/04/2021 from: https://pretraga2.apr.gov.rs/unifiedentitysearch

Atrill, P. (2006). *Financial management for decision makers*. Harlow: Pearsons education Limited.

Bernstein, L. A., & Wild, J. J. (1999). *Analysis of financial statement*s. New York: McGraw-Hill.

Bernstein, L. A., & Wild, J. J. (1999). *Analysis of financial statements*. New York: McGraw-Hill

Brealey R., Myers S., & Allen F. (2010). *Principless of Corporate Finance,* Global edition, New York: McGraw– Hill/Irwin.

Choundy, M. (2006). *An Introduction to Bond Markets*. New Jersey: John Wiley & Sons.

Damodaran, A. (2001).*Corporate Finance: Theory and Practice*. New York: John Wiley.

Domanović, V. (2013). Efektivnost sistema merenja performansi u uslovima savremenog okruženja, *Ekonomski horiznosti, 15*(1), 31-44. Doi: https://doi.org/10.5937/ekonhor1301031D

Elia, M. (2006).*Microfinance: Text and Cases*. Torino: Università degli Studi di Torino, SAA.

Elliott, B., & Elliott, J. (2006). *Financial Accounting, Reporting and Analysis*. Harlow: Pearson Education Limited.

Elliott, B., & Elliott, J. (2006). *Financial Accounting, Reporting and Analysis*. Harlow: Pearson Education Limited.

Erić, D. (1992). *Struktura kapitala i strategijsko upravljanje*. Beograd: Ekonomski fakultet.

Erić, D. (2003). *Finansijska tržišta i instrumenti, 2. Izdanje*. Beograd: Čigoja štampa.

Erić, D., Beraha, I., & Đuričin, S. (2011). Financing innovative small and medium–sized enterprises in times of crisis*, Romanian Journal of Economics,* 33, 59–74.

Evans, M. (2000). Course 1: Evaluating Financial Performance. Retrieved April 20, 2012, from *Excellence in Financial Mana*gement: http://www.exinfm.com/training/pdfiles/course01.pdf

Fabozzi, F. J., & Peterson, P. P. (2003). *Financial Management and Analysis*. Hoboken, New Jersey: John Wiley & Sons, Inc.

Fleisher S. C., & Bensoussan E.B. (2000). A FAROUT way to manage CI analysis, *Competitive Intelligence Magazine, 3*(2), 37-40.

Hagos, T., & Pal, G. (2010). The means of analysis and evaluation for corporate performances. *Annales Universitatis Apulensis Series Oeconomica*, *12*(1), 438-449.

Helfert, E. (2001). *Financial Analysis Tools and Techniques: a Guide for Managers*. New York: McGraw-Hill.

Horne, C.J., & Washowicz M.J. (2007). *Osnovi finansijskog menadžmenta,* prevod. Beograd: Data Status.

Kaplan, R. S., & Anderson, S. R. (2007). *The Evolution od Time – Driven Activity – Based Costing: Introduction u Time – Driven Activity Based Costing*. Boston: HBSP.

Kaplan, R. S., & Norton, D. P. (1996). Linking the balanced scorecard to strategy. *California Management Review, 39*(1), 53–79. Doi: https://doi.org/10.2307%2F41165876

Kothari, J., & Barone, E. (2012). *Finansijsko računovodstvo - međunarodni pristup*, prevod. Beograd: Data Status.

Marr, B. (2012). *Key Performance Indicators: the 75 Measures Every Manager Needs to Know*. Hampshire: Pearson Education Ltd.

Mishkin F.S. & Eakins S.G. (2006).*Financial Markets and Institutions, 6th edition*. Boston: Pearson – Addison Wesley.

Neely, A., Gregory. M., & Platts, K. (1995). Performance measurement system design: a literature review and research agenda. *International Journal of Operations and Production Management, 15*(4), 80–116. Doi: https://doi.org/10.1108/01443579510083622

Palepu, K., Healy, P., & Bernard, V. (2004). *Business Analysis and Valuation Using Financial Statements - Text and Cases*. McGraw Hill.

Republički sekretarijat za javne politike. Retrived 10/04/2021 from: https://rsjp.gov.rs/cir/analiticki-servis/

Rodić J., Andrić M., Vukelić G., & Vuković B., (2017). *Analiza finansijskih izveštaja*. Beograd: Ekonomski fakultet.

Savich, R., & Thompson, L. (1978). Resource allocation within the product life cycle. *MSU Business Topics*, 35-44.

Savich, R., & Thompson, L. (1978). Resource Allocation Within the Product Life Cycle. *MSU Business Topics*, 35-44.

Selling, T. I., & Stickney, C. P. (1989). The effects of business environment and strategy on a firm's rate of return on assets. *Financial Analysts Journal, 45*(1), 43-52. Doi: https://doi.org/10.2469/faj.v45.n1.43

Shim, J. K. (2008). *Analysis and Uses of Financial Statements*. London: Global Professional Publishing Limited.

Stead, M. (1995). *How to Use Company Accounts for Successful Investment Decisions*. FT Pitman Publishing.

Walsh, C. (2008). *Key Management Ratios: the 100+ Ratios Every Manager Needs to Know*. Pearson Education Ltd.

White, G. I., Sondhi, A. C., & Fried, D. (2003). *The Analyses and Use of Financial Statements*. John Wiley & Sons, Inc.

Wiehle, U., Diedelmann, M., Deter, H., Schomig, P., & Rolf, M. (2006). *100 IFRS Financial Ratios*. Wiesbaden: Cometis AG.

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Cointegration analysis of stock market index and exchange rate: the case of Serbian economy

Коинтеграциона анализа тржишног индекса и девизног курса: случај српске економије

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Abstract: Since the late 90's, the existence and direction of causality between the capital market and foreign exchange market have attracted significant attention of theoretical and empirical researchers. This is because both of these financial variables have an indisputable role in the development of each country's economy. In this paper we use Johansen procedure and Granger causality test to examine the existence and direction of short-run and long-run dynamics between the leading stock market index BELEX15 and RSD/EUR exchange rate in Serbia. Using ADF test we find that both series are integrated of order one, and since the value of Johansen trace statistics confirmed the existence of cointegration, we have proceeded with estimation of the VECM model. According to our VECM model, the BELEX15 index adjusts to the long-run equilibrium relationship at a rate of 11.72% in each period, while the exchange rate adjusts to the long-run equilibrium relationship at a rate of 2.73%. We also find that there is unidirectional causality and that the market index influences the exchange rate movements in the short-run in terms of Granger.
Keywords: cointegration, VECM, causality, stock market, exchange rate
JEL classification: E44, G17

Сажетак: Још од касних 90-их, постојање и смер узрочности између тржишта капитала и тржишта девиза привлаче значајну пажњу теоријских и емпиријских истраживача. Ово из разлога што обе финансијске варијабле имају неспорну улогу у развоју економије сваке земље. У овом раду користимо Јохансенову процедуру и Гренџеров тест узрочности како бисмо испитали постојање и правац краткорочне и дугорочне динамике између водећег берзанског индекса BELEX15 и девизног курса RSD/EUR у Србији. Применом ADF теста проналазимо да су обе серије интегрисане реда један, а како је вредност Јохансенове статистике трага потврдила постојање коинтеграције, наставили смо са оценом VECM модела. Према нашем VECM моделу, индекс BELEX15 се прилагођава путањи дугорочне равнотежне везе по стопи од 11,72% у сваком периоду, док се девизни курс прилагођава путањи дугорочне равнотежне везе по стопи од 2,73%. Такође смо открили да постоји једносмерна узрочност и да тржишни индекс краткорочно утиче на кретање девизног курса у смислу Гренџера.
Кључне речи: коинтеграција, VECM, узрочност, тржишни индекси, девизни курс
ЈЕЛ класификација: E44, G17

Introduction

The relationship between stock market and exchange rate market has attracted substantial attention from researchers since the Asian Financial Crisis (Muhammad & Rashid, 2002). Knowledge of this relationship, and the ability to predict the future trends for each variable can be exploited as a valuable forecasting tool by investors, on one side, in their everlasting attempts to earn greater profits, and authorities, on other side, in their attempts to maintain the stability of financial markets (Aydemir & Demirhan, 2009).

There are two aspects of this relationship: short-term and long-term, and both of them are related to the Efficient Market Hypothesis (EMH). Efficient market hypothesis suggests that markets behave in an unpredictable manner and in accordance with the inflow of news which is random in nature (Abdullah et al., 2014). Thus, stock market and foreign exchange markets should show only short-term association. If these two are related over a longer period of time, this would suggest that they are predictable, thus making the efficient market hypothesis invalid (Mookerjee & Yu, 1997). If so, occasional departures from long-run equilibrium can be used to earn profits by investors or to make adjustments by policy makers (Ali et al., 2011; Tomić & Todorović, 2020).

The aim of this paper is to explore short-term and long-term relationship between the leading stock market index BELEX15 and the RSD/EUR exchange rate in Serbia. According to our knowledge, this is the first paper that investigates both short-run and long-run dynamics between the stock market and exchange rate in Serbia and finds that these two are cointegrated. The data period in our research ranges from January 2014 to December 2020. This study is based on ADF stationarity test, Akaike information criteria, Granger causality test and Johansen cointegration trace test. Based on our main findings, our objective is twofold. First, to estimate Vector Error Correction Model. We are particularly interested in coefficients of speed adjustment toward the long-run equilibrium relationship. Second, to test for significance of short-run coefficients in both VECM equations and determine direction of causality between the considered variables.

The structure of this paper is as follows. After brief introduction and existing literature overview, the third part provides methodology used in this paper. The fourth part contains data, descriptive statistics and results of econometric research. At the end of the paper, our conclusions are presented.

1. Literature review

A transition from a fixed to a flexible exchange rate regime took place in 1973. Since then, numerous studies have documented a causal relationship between stock prices and exchange rates (Abidin et al., 2013; Maysami & Koh, 2000). However, the results of more recent research suggest that there is no long-run relationship between the two markets (Rahman & Uddin, 2009).

Today, we can say with certainty that the empirical results concerning the relationship between the foreign exchange and the capital market are inconclusive (Agoraki et al., 2019;

Aydemir & Demirhan, 2009). This is because some studies support positive relationship between the two markets, whereas others find a negative association (Pan et al., 2007; Tsoukalas, 2003; Wajdi, 2019). Also, there are studies that could not find any relationship at all (Jorion, 1991; Nieh & Lee 2001). Even more, we cannot be sure when it comes to the direction of causality.

Bahmani-Oskooee & Sohrabian (1992) found bidirectional causality between S&P500 index and the effective exchange rate of the dollar in the short-run. Their cointegration analysis revealed that there is no long-run relationship between two variables. Using a large sample and daily data, Ajayi & Mougoue (1996) examined the relation between stock prices and exchange rates for eight developed countries. They found that an increase in stock prices has negative short-run, but positive long-run effect on domestic currency value. On the other hand, currency depreciation has negative short-run and long-run effect on the stock market.

Abdalla & Murinde (1997) show unidirectional causality from exchange rates to stock prices in Korea, Pakistan and India, while stock prices Granger-cause exchange rates in the Philippines. Maysami & Koh (2000) examined the long-term equilibrium relationships between the Singapore stock index and selected macroeconomic variables: exchange rate, interest rates, inflation, money supply, domestic exports, and industrial production. They concluded that changes in Singapore's stock market levels do form a cointegrating relationship with changes in price levels, money supply, interest rates, and exchange rates.

Using both the Engle and Granger two-step methodology and Johansen cointegration tests, Nieh & Lee (2001) conclude in their paper that there is no significant relationship between stock prices and exchange rates in the G-7 countries. Tsoukalas (2003) studied the connection between stock prices and economic variables in Cyprus. He found strong evidence that prices and exchange rates are related. Ramasamy & Yeung (2005) investigated the relationship between the exchange rates and stock markets in nine East Asian economies. They found that the direction of causality switches according to the length of period chosen.

Kurihara (2006) used monthly data of the Japanese economy to examine the association between macroeconomic variables and stock prices. He found that exchange rate influences Japanese stock prices. Rahman & Uddin (2009) explored the dynamics between stock prices and exchange rates in three South Asia emerging countries. Their results show that there is no long-run relationship between stock prices and exchange rates. Also, they were not able to find any causality between these variables. Abdullah et al. (2014) found long-run relationship in Malaysia between Kuala Lumpur Composite Index and some key macroeconomic variables, including exchange rate.

As far as Serbia is concerned, Joksimović et al. (2020) investigated International Fisher Effect (IFE) and causality between nominal interest rate and RSD/EUR exchange rate. They found that 1% increase in the nominal interest rate differential, on average, lead to approximately a 0.3% offsetting change in the exchange rate.

2. Data and methodology

As a framework for empirical analysis of the relationship between stock market and exchange rate market in Serbia, the vector autoregressive (VAR) model was applied in this paper. VAR is a multivariate time series model in which all variables are endogenous (Kozhan, 2009). It consists of a system of equations, where each variable in the system has one equation (Mills & Markellos, 2008). The right side of each equation includes a constant and the corresponding number of previous values of all variables in the system. The parameters of each equation in the VAR model are estimated by the method of Ordinary Least Squares (OLS). We define a VAR model of order *k* and dimension *m* as:

$$\boldsymbol{X_t} = \boldsymbol{c} + \Phi_1 \boldsymbol{X_{t-1}} + \Phi_2 \boldsymbol{X_{t-2}} + \cdots + \Phi_k \boldsymbol{X_{t-k}} + \boldsymbol{\varepsilon_t} \qquad (1)$$

where $\boldsymbol{X_t}$ is a vector of time series, $\boldsymbol{c}$ is a vector of a free term. $\Phi_1, \Phi_2, \ldots \Phi_k$ represent parameter matrices and $\boldsymbol{\varepsilon_t}$ represents a vector of white noise whose individual components are uncorrelated time series of zero mean and finite variance $\boldsymbol{\varepsilon_t}$: $N_m(0, \sum)$. *m* is the dimension of the VAR model and refers to the number of time series, while *k* describes the autoregressive structure of time series included in vector $\boldsymbol{X_t}$ (Mladenović & Nojković, 2012).

By subtracting $\boldsymbol{X_{t-1}}$ from both sides of the equation (1) and substituting $\boldsymbol{\Delta X_t} = \boldsymbol{X_t} - \boldsymbol{X_{t-1}}$, VAR model can be represented in form of a vector error correction model (VECM):

$$\boldsymbol{\Delta X_t} = \boldsymbol{c} + \Pi \boldsymbol{X_{t-1}} + \Gamma_1 \boldsymbol{\Delta X_{t-1}} + \cdots + \Gamma_{k-1} \boldsymbol{\Delta X_{t-k+1}} + \boldsymbol{\varepsilon_t} \qquad (2),$$

where $\Pi = \Phi_1 + \Phi_2 + \cdots + \Phi_k - I$, $\Gamma_j = -\sum_{i=j+1}^{k} \Phi_i$, $j = 1, \ldots, k-1$. When the matrix Π is a singular matrix, two conclusions are possible. If $\det(\Pi) = 0$, then the vector error correction model is reduced to the VAR model of the first differences and time series in the vector $\boldsymbol{X_t}$ are not cointegrated. If $rang(\Pi) = r, 0 < r < m$, then $\Pi = \gamma\beta'$, where γ and β are parameter matrices (dimension *m x r*). In this case, time series in the vector $\boldsymbol{X_t}$ are cointegrated, and a corresponding form of the VECM exists. *r* is the number of independent cointegration equations. The elements of the matrix γ can be interpreted as rate of adjustment coefficients toward the long-run equilibrium relationship. The elements of the matrix γ represent cointegrating parameters (Kennedy, 2003).

Cointegration implies the stationarity of a linear combination of individually non-stationary time series (Engle & Granger, 1987). The most common approach in testing the existence of cointegration and estimating cointegration parameters is known as the Johansen procedure (Johansen & Juselius, 1990). In practice it comes down to testing the significance of the rank of the matrix Π. To determine the order (number of lags) *k* in VEC model, we use the lowest value of any of the information criteria (AIC, SC, HQ) for the VAR (k + 1) model. The process of testing the existence of cointegration is sequential and ends with a phase in which the null hypothesis is not rejected for the first time. Testing is based on Johansen's corrected trace statistics, which is compared with the critical test value (Johansen, 1988, 1991). When testing, we use following hypotheses H0: no cointegration, as opposed to H1: there is at least one cointegrating relation. If the value of the test statistic is less than the critical value, the null hypothesis is not rejected and we conclude that cointegration does not exist and the testing process ends. Otherwise, we accept the alternative hypothesis and

conclude that there is at least one cointegrating relation and move on to the next step. In the next step, we set up a new pair of hypotheses to determine whether there is exactly one cointegrating equation (H0) or perhaps there are two stationary combinations (H1). The testing process ends with a phase in which the null hypothesis is not rejected for the first time.

The best-known causality test is the Granger causality test. We use Granger causality test to detect the direction of causality between variables, as well as to determine those variables that are exogenous in relation to a given set of variables (Granger, 1969; Granger et al., 2000). For time series X_{1t}, we say that it causes in the sense of Granger X_{2t}, if the values of X_{2t} can be predicted with greater precision on the basis of knowledge of the previous values X_{1t}, than without them (Kozhan, 2009). Hypotheses we use in Granger's causality test are H0: X_{1t} does not cause X_{2t}, as opposed to H1: X_{1t} causes X_{2t}. If the null hypothesis is correct, it would mean that the equation for X_{2t} in VAR model, unnecessarily contains lagged variables of X_{1t}. The null hypothesis of no causality is rejected at the chosen level of significance if the calculated value of the test statistic is greater than the corresponding critical value of the χ^2 distribution with *k* degrees of freedom (*k* is the number of lags in VAR model).

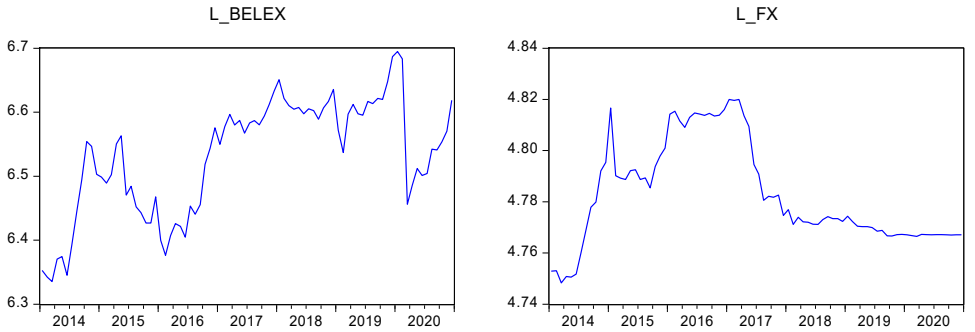
In this paper we use monthly data from 01/01/2014 to 31/12/2020 (84 observations in total). Data for BELEX15 index are taken from the website of the Belgrade Stock Exchange, while data on the average exchange rate of the dinar against the euro (RSD/EUR) are taken from the website of the National Bank of Serbia. According to Jovanović (2019) Serbia has an insufficiently developed financial market characterized by small volume of turnover, a minor number of listed financial instruments and a poor market capitalization. BELEX15 is the index of the most liquid shares traded on the Belgrade Stock Exchange and serves as a basis for creating structured products and derivatives on the domestic and foreign markets. As for the exchange rate regime, a managed fluctuating exchange rate regime is in place in Serbia. A managed fluctuating exchange rate is a fluctuating exchange rate with a defined fluctuation range in accordance with the goals of monetary policy set by national central bank (Marjanac, 2020). The entire analysis was conducted in the Eviews 8.0 software package. Both time series were transformed into natural logarithms for the purposes of empirical analysis. Series marked as L_BELEX and L_FX represent the logarithmic values of BELEX15 and RSD/EUR time series. Series marked as D(L_BELEX) and D(L_FX) represent the first difference of the logarithmic values. L_BELEX(-1), L_BELEX(-2)… represent the lagged values of the L_BELEX series.

3. Empirical analysis and results

Figure 1 gives us a visual idea of the series (non)stationarity at the level, as well as the tendency of the series to rise or fall over time. BELEX15 had ups and downs, but its value at the end of the observed period was above its value from the beginning. The greatest instability on the Serbian capital market, followed by a sharp decline in the value of the index, can be noticed at the turn of the first to the second quarter of 2020 and is caused by investors'

uncertainty due to the COVID-19 epidemic. Regarding the RSD/EUR exchange rate, during the first half of the observed period, the value of the Serbian dinar has gradually decreased. In 2017 and 2018 we have the opposite movement. And finally, for the changes that have been happening since mid-2019, we can say that they are negligible. The highest value of the BELEX15 index was registered in the first month of 2020 (RSD 808.22), while the lowest value was registered in March 2014 (RSD 564.18). On the other hand, dinar had the highest value against the euro (115.38 RSD / EUR) in March 2014, while the lowest value of the dinar against the euro was 123.97 RSD in February 2017. Skewness of the BELEX15 index is negative (-0.33), while the skewness of the exchange rate is positive (0.51). Kurtosis of the both series is below three, telling us that the both distributions are flatter in relation to the normal distribution.

Figure 1. Movement of the BELEX15 index and the RSD-EUR exchange rate



Source: Authors research

In Figure 2 we can see the first difference of the observed series. Note that both series oscillate around zero and that there are no rising and falling trends. Oscillating around zero indicates the stationarity of the first difference, i.e. both series at their level are probably I(1) processes. We are led to the same conclusion by observing the autocorrelation (ACF) and partial autocorrelation function (PACF), which we will not present here in the paper. Instead, we will verify this statement with the Augmented Dickey-Fuller (ADF) test.

Figure 2. First difference of the BELEX15 and the RSD-EUR exchange rate

Source: Authors research

In order to check the stationarity and existence of the unit root, we use the ADF unit root test (Dickey & Fuller, 1979). We test H0: the series has a unit root, against the alternative H1: the series does not have a unit root (the series is stationary). If *p* values above 0.05 are registered, we accept the null hypothesis, otherwise we reject it. Also, the registered *p* values depend on whether we include a constant, linear trend or none of them in the model. The results of the ADF test for the level and the first difference are presented in Table1.

Table 1. Results of the ADF test for the level and first difference

	ADF test (level, log data)				ADF test – (first difference, log data)		
	p-value				p-value		
	none inc.	const. only	const + trend		none inc.	const. only	const + trend
L_BELEX	0,8705	0,1482	0,1956	D(L_BELEX)	0,0000	0,0000	0,0000
L_FX	0,7637	0,4844	0,4810	D(L_FX)	0,0000	0,0000	0,0000

Source: the authors' research

All *p* values are greater than 0.05, meaning that we cannot reject the null hypothesis when it comes to the series level. However, after differentiation, all *p* values become less than 0.05, which means that after differentiation our nonstationary time series become stationary. Finally, we can conclude that both series possess unit root and are integrated of order one I(1). But, before we start estimating the VECM model, it is necessary to check the existence of cointegration. In order to determine the optimal number of lags to be included in model, we decided to use the AIC (Akaike, 1974). The results of the information criteria (AIC, SC, HQ) are given in Table 2.

Table 2. IC results

No. of lags	**AIC**	SC	HQ
0	-7.811036	-7.749701	-7.786523
1	-11.27487	-11.09086*	-11.20133*
2	-11.23472	-10.92804	-11.11216
3	-11.28176	-10.85241	-11.11017
4	**-11.29382***	-10.74180	-11.07321
5	-7.811036	-10.54105	-10.94610

Source: the authors' research

We examined the existence of cointegration by applying the Johansen test and Pantula principle, which is explained below. Since we have two variables, we cannot have more than one cointegrating equation. Table 3 contains sample values of Johansen trace statistics, as

well as registered *p* values. If the registered *p* value is less than 0.05, we reject the null hypothesis (H0: there are no more than *n* cointegration equations), where *n*, in our case, goes from zero to one.

Table 3. Johansen cointegration test results

H0 regarding the number of CE (cointegrating equations)	1st variant, Model with intercept in CE, no intercept in VAR		2nd variant, Model with intercept in CE and VAR		3rd variant, Model with intercept and trend in CE, no trend in VAR	
	Trace statistic	p value	Trace statistic	p value	Trace statistic	p value
Zero CE	25,7748	0,0078	25,1211	0,0013	27,5389	0,0308
At most one CE	2,1305	0,7516	1,6973	0,1926	4,1037	0,7270

Source: the authors' research

The Pantula principle was implemented by starting from the most restrictive model and observing the test results (*p* value or trace statistics value) when the null hypothesis is that there are no cointegrating equations. If we cannot reject the null hypothesis (*p* value greater than 0.05 or Trace statistic value greater than the critical value), we move on to the next model, and if we cannot reject the null hypothesis here either, we move on to the last model. If in at least one case we reject the null hypothesis, we move on to the next type of null hypothesis (that there is at most one CE) and conduct an identical consideration. We stop the procedure when we first reject the null hypothesis. In our case, we managed to reject the null hypothesis in all three variants of the model. Now, we can conclude that there is one cointegrating relation and that it should be included in our model.

Having confirmed the existence of cointegration, we can now finally estimate VECM model. We have decided to estimate the 2nd variant - model with intercept in CE and VAR. Our VECM model consists of two equations. The parameters of the cointegrating relation are highlighted at the beginning of each equation (given in the first bracket of the first and second equation, respectively). Note that the value of the adjustment coefficient in both equations is negative (-0.1172 and -0.0273, respectively) and statistically significant (|-2.1452| > 1.96 and |-3.9375| > 1.96, which is necessary to have a valid economic interpretation. Our estimated VECM model is given in Table 4.

Table 4. VECM model

Estimated coefficients for L_BELEX as a target variable:
D(L_BELEX) = -0,1172*(**L_BELEX(-1) + 2.8376*L_FX(-1) - 20.1129**) + 0,0669*D(L_BELEX(-1)) – 0,1035*D(L_BELEX(-2)) + 0,0361*D(L_BELEX(-3)) – 0,4793*D(L_FX(-1)) + 0,0581*D(L_FX(-2)) + 0,0176*D(L_FX(-3)) + 0,0032 (3)
Estimated coefficients for L_FX as the target variable:
D(L_FX) = -0,0273*(***L_BELEX(-1) + 2.8376*L_FX(-1) - 20.1129***) + 0,0281*D(L_BELEX(-1)) + 0,0329*D(L_BELEX(-2)) + 0,0329*D(L_BELEX(-3)) – 0,1112*D(L_FX(-1)) + 0,2053*D(L_FX(-2)) – 0,0832*D(L_FX(-3)) – 0,00007 (4)

Source: the authors' research

The value of the adjustment coefficient (-0.1172) in equation (3) for the BELEX15 market index shows us that 11.72% of the deviation from the long-run equilibrium is adjusted in each period. In other words, the BELEX15 index adjusts to the long-run equilibrium relationship at a rate of 11.72% in each period. Also, a statistically significant value of the adjustment coefficient tells us that the exchange rate affects the movement of the market index in the long run. To examine the presence of short-term dynamics and determine whether the exchange rate affects the market index movements in the short term, we conducted Wald test. We tested the null hypothesis (coefficients are not statistically significant), against the alternative (at least one of the coefficients is statistically significant). Because of χ^2 test statistics value (0.3517) and p value (0.95), we cannot reject the null hypothesis. This further means that the coefficients of short-term dynamics are not statistically significant and that the exchange rate does not affect market index movements in the short run.

As for the second equation of our VECM model, exchange rate equation, the negative and statistically significant value of the adjustment coefficient shows us that in each period, exchange rate adjusts to the long-run equilibrium relationship at a rate of 2.73%. As for the short-run dynamics, the results of Wald's test (p value = 0.0103) revealed that the coefficients are statistically different from zero, meaning that market index affects the exchange rate movements. Because all short-run coefficients have positive values, we can say that the increase in the market index leads to an increase in the exchange rate (decrease in the value of the dinar against the euro).

By conducting a Granger causality test, we come to the same conclusions regarding the short-term dynamics. The results of the Granger test are given in Table 5.

Table 5. Granger causality test results

Dependent variable: D(L_BELEX)			
Excluded	Chi-sq	df	Prob.
D(L_FX)	0.351664	3	0.9500
Dependent variable: D(L_FX)			
Excluded	Chi-sq	df	Prob.
D(L_BELEX)	**11.27300**	**3**	**0.0103**

Source: the authors' research

Further, we have examined the quality of our VECM model by checking for the presence of autocorrelation and distribution of the residuals. To examine the existence of autocorrelation in our VECM model, we conducted multidimensional Breusch-Godfrey LM autocorrelation test. The null hypothesis H0 (there is no autocorrelation of order h in our model) was tested, against the alternative H1 (there is autocorrelation for any $i \in \{1,2..h\}$). As all p values are above 0.05, we conclude that we cannot reject the null hypothesis, i.e. there is no cumulative autocorrelation. The results of the multidimensional BG autocorrelation test at five lags are given in Table 6.

Table 6. BG autocorrelation test results

Lag	1	2	3	4	5
LM-Statistics	2,5018	8,5383	6,8843	0,7426	2,9626
p value	0,6443	0,0737	0,1421	0,9460	0,5341

Source: the authors' research

Finally, we performed Lütkepohl multidimensional normality test. As the obtained *p* value of this test is less than 0.05, we conclude that the residues of our VECM model do not have normal distribution.

Conclusion

The purpose of this paper was to examine the existence and interdependence of short-term and long-term dynamics between the stock exchange index BELEX15 and the exchange rate RSD/EUR in Serbia. Visual inspection and ADF unit root test confirmed that both series are integrated of order one. After determining the optimal number of lags, we conducted a Johansen cointegration test based on trace statistics to verify the existence of a long-run equilibrium relationship between the observed series. Since the value of trace statistics in all three tested variants confirmed the existence of cointegration, the next step was to estimate the VECM model. Our VECM model consists of two equations and the value of the adjustment coefficient in each equation is negative and statistically significant. Each month, BELEX15 index adjusts to the long-run equilibrium relationship at a rate of 11.72%. On the other hand, according to the value of the adjustment coefficient in the second equation, exchange rate adjusts to the long-run equilibrium relationship at a rate of 2.73%. Next, using Wald test and Granger causality test, we examined the presence of short-term dynamics between the two variables and found some evidence of unidirectional causality. The results of Wald's test revealed that the exchange rate does not affect the movement of the market index in the short run. However, since the coefficients of short-term dynamics were statistically different from zero in the second equation, we have concluded that the market index influences exchange rate in the short run. These results have been confirmed by a Granger causality test.

In this paper we have found evidence of both short-run and long-run relationship between stock prices and exchange rate in Serbia. The major implication of our findings is that investors can use information from one market, for instance stock market, to predict the behavior of the other market and earn profits. Also, policy makers can use exchange rate as a tool to attract foreign investment. Since our results at the same time support and oppose the results of other researches, they should not be taken for granted. We are aware that our results may be the product of deeper causes, macroeconomic factors such as government policy, expectations, degree of market liberalization or capital control etc. We are also aware that the significance of our results may be due to the chosen time horizon or data frequency. Therefore, further and broader analysis is needed. We suggest further research by using other economic variables such as interest rates, GDP growth rate, oil prices and money supply in exploring relationship between exchange rates and stock prices.

References

Abdalla, I. S. A., & Murinde, V. (1997). Exchange rate and stock price interactions in emerging financial markets: evidence on India, Korea, Pakistan and the Philippines. *Applied Financial Economics, 7*(1), 25-35. Doi: https://doi.org/10.1080/096031097333826

Abdullah, A. M., Saiti, B.,& Masih, A. M. (2014). *Causality between stock market index and macroeconomic variables: a case study for Malaysia. MPRA Paper 56987*, University Library of Munich, Germany.

Abidin, S., Walters, C., Lim, K., & Banchit, A. (2013). Cointegration between stock prices and exchange rates in Asia-Pacific countries. *Investment management & financial innovations, 10*(2), 142-146.

Agoraki, M.-E.K., Georgoutsos, D.A., & Kouretas, G.P. (2019). Capital markets integration and cointegration: testing for the correct specification of stock market indices. *Journal of Risk and Financial Management*, *12*(4), 1-20, 186. Doi: https://doi.org/10.3390/jrfm12040186

Ajayi, R.A., & Mougouė, M. (1996). On the dynamic relation between stock prices and exchange rates. *Journal of Financial Research, 19*, 193-207. Doi: https://doi.org/10.1111/j.1475-6803.1996.tb00593.x

Akaike, H., (1974). A new look at the statistical model identification, *IEEE Transactions on Automatic Control, 19*(6), 716–723. Doi: https://doi.org/10.1109/TAC.1974.1100705

Ali, S., Butt, B., & Ur Rehman, K. (2011). Comovement between emerging and developed stock markets: an investigation through cointegration analysis, *World Applied Sciences Journal, 12*(4), 395-403

Aydemir, O., & Demirhan, E. (2009). The relationship between stock prices and exchange rates: evidence from Turkey. *International Research Journal of Finance and Economics, 1*(23), 207–215. Doi: https://doi.org/10.1007/bf02296425

Bahmani-Oskooee, M., & Sohrabian, A. (1992). Stock prices and the effective exchange rate of the dollar. *Applied Economics, 24*(4), 459-464. Doi: https://doi.org/10.1080/00036849200000020

Dickey, D.A., & Fuller, W.A. (1979). Distribution of the Estimators for Autoregressive Time Series with a Unit Root. *Journal of the American Statistical Association, 74*(366), 427–431. Doi: https://doi.org/10.2307/2286348

Engle, R. F., & Granger, C. W. J. (1987). Co-integration and error correction: Representation, estimation and testing, *Econometrica, 55*(2), 251-276. Doi: https://doi.org/10.2307/1913236

Granger, C. W. J., Huang, B., & Yang C. (2000). A bivariate causality between stock prices and exchange rates: evidence from recent Asian flu. *The Quarterly Review of Economics and Finance, 40*, 337-354. Doi: https://doi.org/10.1016/S1062-9769(00)00042-9

Granger, C.W.J. (1969). Investigating Causal relations by econometric models and cross-spectral methods. *Econometrica, 37*(3), 424–438. Doi: https://doi.org/10.2307/1912791

Jorion, P. (1991). The pricing of exchange rate risk in the stock market. *The Journal of Financial and Quantitative Analysis, 26*(3), 363-376. Doi: https://doi.org/10.2307/2331212

Joksimović, M., Joksimović, D., & Grujić-Vučkovski, B. (2020). A test of international fisher effect: researching from Serbia and the European Union. *Ekonomika, 66*(2), 49-61. Doi: https://doi.org/10.5937/ekonomika2002049J

Jovanović, M. (2019). Initial public offering as a source of financing and its significance for the development of the Serbian capital market. *Ekonomika, 65*(2), 99-108. Doi: https://doi.org/10.5937/ekonomika1902099J

Johansen, S. (1988). Statistical analysis of cointegration vectors. *Journal of Economic Dynamics and Control, 12*(2-3), 231-254. Doi: https://doi.org/10.1016/0165-1889(88)90041-3

Johansen, S., (1991). Estimation and hypothesis testing of cointegrating vectors in Gaussian vector autoregressive models. *Econometrica, 59*(6), 1551-1580. Doi: https://doi.org/10.2307/2938278

Johansen, S., & Juselius, K. (1990). Maximum likelihood estimation and inferences on cointegration — with applications to the demand for money. *Oxford Bulletin of Economics and Statistics, 52*(2), 169–210. Doi: https://doi.org/10.1111/j.1468-0084.1990.mp52002003.x

Kennedy, P. (2003). *A guide to econometrics*. MA: MIT press.

Kozhan, R. (2009). *Financial Econometrics–With Eviews*. Roman Kozhan & Ventus Publishing. Retrieved 06/02/2021 from http://artemisa.unicauca.edu.co/~sidrobo/libros/FinancialEconometricsEviews.pdf.

Kurihara, Y. (2006). The relationship between exchange rate and stock prices during the quantitative easing policy in Japan. *International Journal of Business, 11*(4), 375-386.

Maysami, R., & Koh, T.S. (2000). A vector error correction model of the Singapore stock market. *International Review of Economics & Finance, 9*, 79-96. Doi: https://doi.org/10.1016/S1059-0560(99)00042-8

Marjanac, D. (2020). The effect of the exchange rate system on the economic growth of Bosnia and Herzegovina. *Anali Ekonomskog fakulteta u Subotici, 43*, 49-65. Doi: https://doi.org/10.5937/AnEkSub2001049M

Mills, T. C., Markellos, R. N., (2008). *The Econometric Modelling of Financial Time Series*. Cambridge: Cambridge University Press.

Mladenović, Z., & Nojković, A. (2012). *Primenjena analiza vremenskih serija*. Beograd: Centar za izdavačku delatnost Ekonomskog fakulteta.

Mookerjee, R., & Yu, Q. (1997). Macroeconomic variables and stock prices in a small open economy: the case of Singapore. *Pacific-Basin Finance Journal, 5*(3), 377-388, Doi: https://doi.org/10.1016/S0927-538X(96)00029-7

Muhammad, N., Rashid, A. (2002). Stock prices and exchange rates: are they related? Evidence from South Asian countries. *The Pakistan Development Review, Pakistan Institute of Development Economics, 41*(4), 535-550. Doi: https://doi.org/10.30541/v41i4IIpp.535-550

Nieh, C. C., & Lee C. F. (2001). Dynamic relationship between stock prices and exchange rates for G-7 countries. *The Quarterly Review of Economics and Finance, 41*(4), 477-490. Doi: https://doi.org/10.1016/S1062-9769(01)00085-0

Pan, M., Fok, R.C., & Liu, Y.A. (2007). Dynamic linkages between exchange rates and stock prices: evidence from east Asian markets. *International Review of Economics & Finance, 16*(4), 503–520. Doi: https://doi.org/10.1016/j.iref.2005.09.003

Rahman, L., & Uddin, J. (2009). Dynamic relationship between stock prices and exchange rates: Evidence from three South Asian countries. *International Business Research, 2*(2), 197-174. Doi: https://doi.org/10.5539/ibr.v2n2p167

Ramasamy, B., Yeung, M.C.H. (2005). The causality between stock returns and exchange rates. *Australian Economic Papers, 44*(2), 162-169. Doi: https://doi.org/10.1111/j.1467-8454.2005.00257.x

Tomić, N., & Todorović, V. (2020). Potential negative implications of Libra cryptocurrency. *Ekonomika, 66*(1), 13-24. Doi: https://doi.org/10.5937/ekonomika2001013T

Tsoukalas, D. (2003). Macroeconomic factors and stock prices in the emerging Cypriot equity market. *Managerial Finance 29*(4), 87-92. Doi: https://doi.org/10.1108/03074350310768300

Wajdi, M. (2019). On the co-movements among stock prices and exchange rates cointegration: a VAR/VECM approach. *Journal of Finance and Investment Analysis, 8*(1), 61-75.

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Analysis of capital buffers in Serbia

Анализа заштитних слојева капитала у Србији

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Abstract: The aim of this paper is to analyse all capital buffers that are currently applied in Serbia. Regulation that transposes Basel III regulatory standards in Serbia was adopted in December 2016. These buffers increase the resilience of banks to losses, reduce excessive or underestimated exposures and restrict the distribution of capital. An assessment of the long-term trend of the credit-to-GDP ratio is based on using a one-sided Hodrick-Prescott filter and the selected value of the parameter λ equals 400000. Also, this paper used the following methods of research: inductive and deductive methods, methods of analysis and synthesis, classification method and the method of comparison. Analysis has shown that capital buffers that are currently applied in Serbia are fully harmonized with European Union regulations and international best practices.
Keywords: capital buffers, financial stability, macroprudential policy, capital requirement, Basel III
JEL classification: E22, E50, E58, G28

Сажетак: Циљ овог рада је анализа свих заштитних слојева капитала који се тренутно примењују у Србији. У децембру 2016. године усвојени су прописи којима су Базел III стандарди уведени у Србији. Увођењем заштитних слојева капитала повећава се отпорност банака на губитке, смањују прекомерне или потцењене изложености и ограничава расподела капитала. Процена одступања учешћа кредита у БДП-у од свог дугорочног тренда заснива се на коришћењу једностраног Hodrick-Prescott филтера и изабрана вредност параметра λ износи 400000. Такође, у овом раду користиће се следеће методе истраживања рада, а то су индуктивне и дедуктивне методе, методе анализе и синтезе, метода класификације и методе упоређивања. Анализа је показала да су заштитни слојеви капитала који се тренутно примењују у Србији у потпуности усклађене са прописима Европске уније и најбољом међународном праксом.
Кључне речи: заштини слојеви капитала, финансијска стабилност, макропруденцијална политика, капитални захтеви, Базел III
ЈЕЛ класификација: E22, E50, E58, G28

Introduction

The need to improve the financial regulatory framework, as well as the lack of instruments that would act on systemic risk have been pointed out during and after the global financial crisis of 2007/2008. According to Annual Financial Stability Report (2019), „new standards and instruments have been developed and implemented at the global level in order to preserve and strengthen the stability of the financial system“ (p. 14). One of the responses of the shortcomings of the system highlighted by the global financial crisis has been the establishment of adequate regulatory bodies. At the level of the European Union, the European Systemic Risk Board has been established, which is according to Annual Financial Stability Report (2019), „entrusted with the responsibility for macroprudential supervision of the financial system of the European Union and the prevention and mitigation of systemic risk. After the weaknesses of the financial system were identified,

which manifested during the financial crisis, as well as the shortcomings of the Basel II standards, the process of amending those regulations began" (p. 15).

Capital buffers symbolize one of the key novelties of Basel III standard and represent an "additional Common Equity Tier 1 capital that banks are obliged to maintain above the prescribed regulatory minimum. Capital buffers should limit systemic risks in the financial system, which can be structural (systemic risk buffer and capital buffer for a systemically important bank) or cyclical (capital conservation buffer and countercyclical capital buffer)" (Annual Financial Stability Report, 2019, p. 15). In this regard, a financial stability function has been developed with the aim of limiting the effect of systemic risk in the financial system (Puzanova & Dullmann, 2013; Tomuleasa, 2015). In the most general case, systemic risk can be defined "as a risk that affects the normal functioning of the entire financial system, and not just individual financial institutions" (Annual Financial Stability Report, 2019, p. 14).

The aim of this paper is to analyse all capital buffers that are currently applied in Serbia. An assessment of the long-term trend of the credit-to-GDP ratio is based on using a one-sided Hodrick-Prescott filter and the selected value of the parameter λ equals 400000. Also, inductive and deductive methods, methods of analysis and synthesis, classification methods, and comparison methods will be used in this paper. This paper is organized in the following way: literature review will be presented in Section 1, while Section 2 deals with the analysis of all capital buffers. Domestic regulation for each capital buffers in Section 2 will be displayed, then indicators for activating and changing their rate, as well as proposals for their improvement. The paper ends with a Conclusion, where all the main points of this paper will be summarized.

1. Literature review

The development of macroprudential policy, which is a relatively new regulation, began after the global financial crisis of 2007/2008. This policy includes "activities and measures aimed at preventing the existence of systemic risks, i.e. risk disruption to financial services in the financial system that could pose serious negative consequences for the real economy" (Annual Financial Stability Report, 2019, p. 15). It is a regulation that did not formally exist before 2008, and in that period, in order to limit systemic risks, the states applied the instruments of monetary, microprudential and fiscal policy. Since then macroprudential policy and its instruments have been constantly evolving taking into account preservation and improvement of financial stability as one of the aims for the central bank, together with the achievement of price stability.

In order to increase banks' resilience to losses, as well as to reduce excessively or underestimated exposure and to limit the distribution of capital, capital buffers have been introduced (Abbas et al., 2019). The level of capital requirements influences financial soundness indicators (Ercegovac et al., 2019; Vesić et al., 2019). In good times, banks, in accordance with the recommendation of the Basel Committee on Banking Supervision (BCBS, 2010), create capital reserves that will then be used when the systemic risk materializes (Ayuso et al., 2002; Seidler & Gersl, 2012). Fonseca & González (2010)

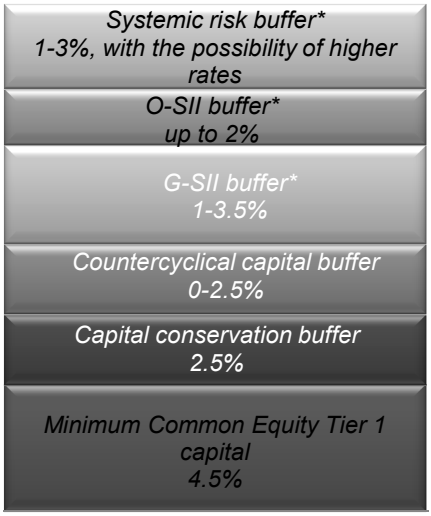
indicated in their analysis that banks need to keep capital above minimum set levels due to market discipline, by reason of expectations of quasi-earnings (shareholders are interested that the bank has enough capital to prevent operating losses) and the third reason is the need to adjust to the capital requirements set by the regulator. Higher capital requirements indicate better soundness and safety of a bank (Chen et al., 2014), they are built up in an expansion phase and are used during a recession (Drehmann et al., 2010; Heid & Krüger, 2011; Montagnoli et al., 2018), increase stability and resilience of financial system (Noreen, Alamdar & Tariq, 2016) and maintain financial system resilience (Bui et al., 2017). Besides the aforementioned, it is equally important to access the influence of capital buffers on level of risk (especially credit risk), supervisory discipline, impact on insurance buffer, economic growth, and competition between financial institutions (Lindquist, 2003).

The global financial crisis revealed the pro-cyclicality of the financial system and the need to use adequate instruments and regulations. The pro-cyclicality of the financial system influences the decision-making process, risk management, and implications of macroprudential policy (Moudud‐Ul‐Huq, 2019, 2019a). In this respect, it is equally important to analyse the cyclical behaviour of capital buffers and evidence is mixed. According to Jokipii & Milne (2006), and data for the European Union, there is a significant positive relationship with the business cycle for co-operative and smaller banks, while negative is present for commercial and savings banks. In the case of Colombian banks and period 1996-2010, analysis by García-Suaza, Gómez-González, Pabón and Tenjo-Galarza (2011) indicates a negative co-movement between the business cycle and capital buffers, while for six largest Canadian banks in period 1982-2010 Guidara, Son Lai, Soumaré & Tchana (2013) concluded that there was positive movement between capital buffers and business cycles. Stolz & Wedow (2005) found that in the case of German banks (savings and cooperative banks) for the period 1993-2003 capital buffers fluctuate anticyclically over the business cycle.

2. Capital buffers in Serbia

The Law on the National Bank of Serbia prescribes how “the National Bank of Serbia contributes to the preservation and strengthening of the financial system of the Republic of Serbia” (p. 1), and accordingly, the National Bank of Serbia Executive Board determines and implements instruments and measures. The National Bank of Serbia has at its disposal all instruments and measures of macroprudential policy that are fully in line with the recommendation of the European Systemic Risk Board on transitional goals and instruments of macroprudential policy (ESRB/2013/1). The National Bank of Serbia consultative document "Macroprudential Framework", published in March 2015, regulates the goals, “instruments, and decision-making process of macroprudential policy and specifies its ultimate goal – to contribute to preserving and strengthening the stability of the financial system by preventing new systemic risks and reducing and eliminating existing ones, ensuring the contribution of the financial system to sustainable economic growth” (Annual Financial Stability Report, 2019, p. 15).

Figure 1: Capital buffer rates – Common Equity Tier 1 capital as a percentage of total risk exposure amount



**Note: Only the highest buffer rate is applied in exceptional cases. O-SII refers to Other Systemically Important Institutions, while G-SII denote Global Systemically Important Institutions. There are currently no banks in Serbia that are identified as Global Systemically Important Institutions.*

Source: National Bank of Serbia

With the adoption of the Decision on Capital Adequacy of the Bank, the Directive 2013/36/EU (CRD IV Directive) was transposed into the domestic regulatory framework which regulates capital buffers. These buffers additionally increased "the resilience of banks to losses, reduced excessive or underestimated exposures, and restricted the distribution of capital. Since June 30, 2017, the following capital buffers are applied in Serbia (Chart 1):

1. systemic risk buffer
2. capital conservation buffer
3. countercyclical capital buffer
4. capital buffer for a systemically important bank" (Annual Financial Stability Report, 2019, p. 16).

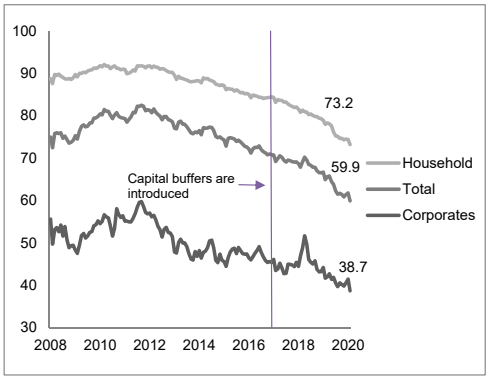
2.1. Systemic risk buffer

The key risk in the financial system of the Republic of Serbia is the high level of placement and deposit euroisation. The "euroised financial system itself contains a systemic risk that can be realized in case of a sudden depreciation of the domestic currency" (Annual Financial Stability Report, 2019, p. 101). In that case, foreign currency liabilities denominated in domestic currency suddenly increase, and as most borrowers earn their income in domestic currency, this causes a sharp increase in their indebtedness. In this way, due to systemic foreign currency risk, systemic problems with solvency and liquidity of both corporates and households can occur. According to Windischbauer (2016) countries

with a level of euroisation, both to deposit and placement side, higher than 40% can be categorized as highly euroised economies, while another study (Álvarez-Plata & García-Herrero, 2008) concluded that the degree of euroisation between 10% and 40% is considered moderate, while the degree of euroisation below 10% is considered low. Indicators used for assessing the level of euroisation measure the share of "foreign currency and foreign currency-indexed placements in total placements to corporates and households and the share of foreign currency and foreign currency-indexed deposits in total deposits of the corporates and households" (Annual Financial Stability Report, 2019, p. 20-21).

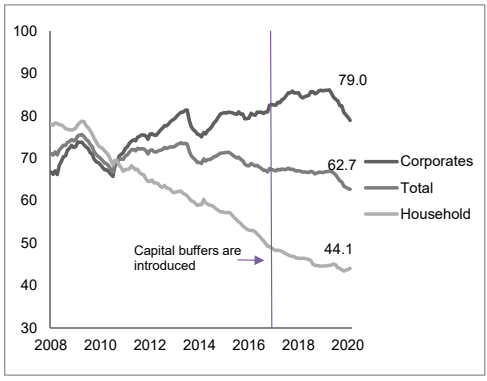
The banking sector of the Republic of Serbia is characterized by a high level of euroisation both of deposits (in December 2020, 59.9% of total deposits of corporates and households were foreign currency and foreign currency-indexed deposits) and placements (in December 2020, 62.7% of total placements to corporates and households were foreign currency and foreign currency-indexed placements) – Figures 2 and 3.

Figure 2: Share of foreign currency and foreign currency-indexed deposits in total corporate and household deposits (in %)



Source: National Bank of Serbia

Figure 3. Share of foreign currency and foreign currency-indexed placements in total corporate and household placements (in %)



Source: National Bank of Serbia

The systemic risk buffer (hereinafter: SRB) is a macroprudential instrument, which represents additional Common Equity Tier 1 capital that banks are obliged to maintain in order to prevent and mitigate systemic risks of a long-term, non-cyclical nature. In addition to strengthening the resilience of the banking sector to potential shocks, the SRB encourages banks to reduce exposure to identified structural risks, if an exposure-based measure is applied. According to the Decision on the Rate and Manner of Maintaining the Systemic Risk Buffer valid from June 30, 2017, „all banks whose share of foreign currency and foreign currency-indexed placements to corporates and households in Serbia in the total placement of that bank to corporates and households in Serbia exceeds 10% are obliged to maintain the SRB equal to 3% of their total placements of that bank approved to corporates and households in the Republic of Serbia" (Annual Financial Stability Report, 2019, p. 102). The advantage of a unique rate is, among other things, easier communication with banks and the public. The maximum SRB rate does not exist, but the European Union

Member States are obliged to notify the competent authorities (European Commission, European Systemic Risk Board, European Banking Authority) for rates above 3% or obtain their opinions. SRB is a flexible instrument and can be implemented in all or certain parts of risk exposure, on domestic exposure or on third-country exposure, on all financial institutions, or on some part of the financial sector (Gabrieli & Jimborean, 2020).

The basic specificity of the use of the SRB in Serbia relates to the base for calculating capital requirements. While in most other EU countries the SRB is applied to the total risk-weighted bank assets, the base for calculating capital requirements in Serbia is foreign currency and foreign currency-indexed placements of the bank approved to corporates and households in Serbia. In this way, although all banks are required to maintain the same rate (i.e. 3%), the capital requirements of individual banks vary, depending on their degree of euroisation. With such application of the SRB, banks are directly encouraged to reduce their degree of euroisation, because in the case that the amount of euroised placements is reduced, the amount of capital requirements will also be reduced. It is precisely this way of applying the SRB that the European Systemic Risk Board recognized and recommended to the European Commission, which was subsequently implemented in the Capital Requirements Directive V (Directive EU 2019/878), stating that if the rate is directly applied to the exposures that cause systemic risk, as is the case in Serbia, then it directly affects the limitation of that systemic risk. "On the other hand, by applying SRB to entire risk-weighted bank assets, i.e. without targeting specific exposures, less impact on systemic risk mitigation is achieved" (Annual Financial Stability Report, 2019, p. 56).

„In order to decrease the level of euroisation in the financial system of the Republic of Serbia, the National Bank of Serbia and the Government signed Memorandum on the Strategy of Dinarisation of the Serbian Financial System in April 2012" (Annual Financial Stability Report, 2019, p. 101). Having in mind that since the dinarisation strategy was introduced nine years ago, macroeconomic stability has been maintained „and financial stability strengthened, the Government and the National bank of Serbia signed a new Memorandum on the Dinarisation strategy in December 2018" (Annual Financial Stability Report, 2019, p. 101). Aware that dinarisation is a gradual and long-term process, the Government and the National bank of Serbia reflected on the achieved results from the measures and activities taken thus far and, based on them, agreed and defined additional measures and activities so as to encourage further dinarisation. The objective of this Strategy is to support greater use of the dinar and reduce foreign currency risk in the domestic financial system.

In the previous period, the National Bank of Serbia applied different measures in order to promote the use of dinar in the financial system. From monetary policy stance following measures are adopted:

1. Only dinar securities without a currency clause can be used as a collateral in the National Bank of Serbia monetary operations, related to open market operations, credit facilities and short-term liquidity loans to banks;
2. According to the Decision on Amending and Supplementing the Decision on Conditions and Manner of Implementing Open Market Operations (2020) „dinar

securities, without a currency clause, issued by an international financial organization and development bank, or a financial institution which was founded by a foreign state and whose credit rating was set at "AAA" by Standard & Poor's or Fitch-IBCA, and/or "Aaa" by Moody's, included into the list of collateral for the National Bank of Serbia monetary operations (beside dinar securities, without a currency clause issued by the National Bank of Serbia and Republic of Serbia)" (p. 2);

3. By means of required reserves, the National Bank of Serbia promotes the use of dinar by differentiating required reserves rate on dinar vs. foreign exchange sources of funding. At the moment required reserve ratios are 5%/0% on dinar sources vs. 20%/13% on foreign currency sources up (depending on the maturity of sources) and 100% on foreign currency-indexed liabilities in dinars.

From financial stability perspective, the following measures were applied in order to promote dinar lending and mitigated the risks arising from excessive use of the currency clause:

1. The LTV (loan to value) limit of 80% was introduced for mortgage loans indexed in foreign currency. The LTV limit is applied only to foreign currency and foreign currency - indexed loans, while dinar loans are exempt from its application in order to stimulate long-term dinar lending;
2. Loans to natural persons may be indexed only to euro. This measure was introduced in order to limit systemic foreign currency risk stemming from the use of currencies other than the euro;
3. The introduction of mandatory downpayment by borrowers in the amount of 30% for all foreign currency-indexed or foreign currency loans that do not relate to housing loans and credit cards, while all dinar loans are excluded from this measure.

2.2. Capital conservation buffer

The aim of applying a capital conservation buffer is to preserve the bank's capital. In the case that a bank breaches this buffer, automatic protection measures are applied in order to limit the payment of dividends and bonuses to that bank. Basel Committee of Banking Supervision prescribed that banks are in obligation to introduce capital conservation buffer in the phase-out process. According to Basel III in January 2016 capital conservation buffer was set at the level of "0.625% of risk-weighted assets and then increased by 0.625 pp at the beginning of each following year, reaching 2.5% of risk-weighted assets" (Annual Financial Stability Report, 2019, p. 56) at the beginning of January 2019.

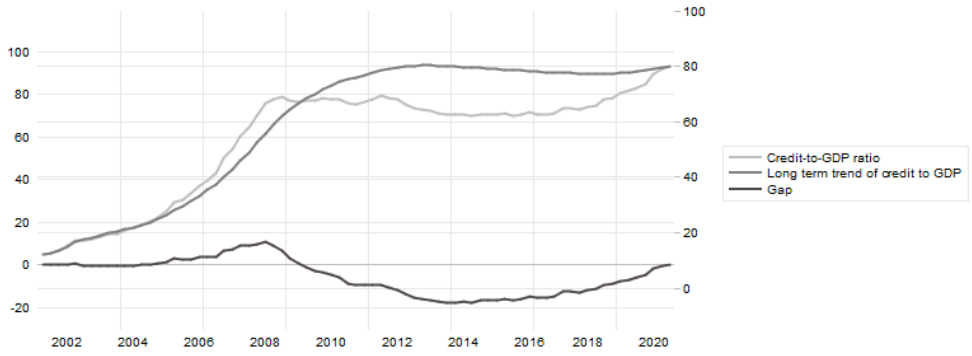
According to section 434 of the Decision on Capital Adequacy (2021), banks in Serbia are "obliged to maintain a capital conservation buffer on an individual and consolidated basis equal to 2.5% of their risk-weighted assets" (p. 335). The capital conservation buffer may consist only of Common Equity Tier 1 capital and applies in Serbia as of 30 June 2017. Since its introduction capital conservation buffer in Serbia is set at the level of 2.5% of risk-weighted assets.

2.3. Countercyclical capital buffer

"Countercyclical Capital Buffer (hereinafter: CCyB) is a macroprudential instrument used for mitigating the procyclicality of the financial system. CCyB represents an additional buffer of Common Equity Tier 1 capital above the prescribed regulatory minimum that a bank maintains to prevent and mitigate long-term, cyclical systemic risks" (Annual Financial Stability Report, 2019, p. 53). According to the Decision on Capital Adequacy of Banks (2021) the National Bank of Serbia sets the CCyB rate for the Republic of Serbia "on a quarterly basis, taking into account:

(1) Reference indicator based on the difference between the credit-to-GDP ratio and its long-run trend (credit gap in GDP), which is calculated on a quarterly basis, in line with the recommendations of the European Systemic Risk Board regarding the method of measuring and calculating difference between the credit-to-GDP ratio and its long-run trend;
(2) Valid recommendations of the European Systemic Risk Board and any recommendations of that Board regarding the determination of the CCyB rate;
(3) Other indicators it considers relevant to monitoring the cyclical dimension of systemic risk" (p. 336).

Figure 4: Credit-to-GDP ratio and its long run trend



Source: the author's research.

The CCyB rate is determined on the basis of an expert assessment as a combination of analysis on reference indicators and additional optional indicators. The main indicator of excessive credit activity is the share of the credit gap in GDP. Empirical research, done by Drehmann & Tsatsaronis (2014), has shown that this is one of the most reliable indicators for the early prediction of an upcoming financial crisis. CCyB is introduced in order for regulators to increase capital requirements during the credit expansion period (Castro, 2020). Credit growth is considered excessive if the credit-to-GDP ratio is greater by a minimum of 2 pp than its long-term trend, and the credit growth rate does not support economic growth. The long-term trend of the credit-to-GDP ratio is estimated using a one-sided Hodrick-Prescott (HP) filter. HP filter is a mathematical tool used in macroeconomics to evaluate the trend of variables over time. A one-sided,

recursive, HP filter for trend calculation uses only the information available at the observed time. In order to determine the long-term trend of GDP, the selected value of the parameter λ equals 400000 (Figure 4).

According to the Decision on Capital Adequacy of Banks (2021) "CCyB rate for the Republic of Serbia ranges between 0% and 2.5% of the bank's risk-weighted assets, setting the rate in steps of 0.25 pp or multiples of 0.25 pp" (p. 336), which is in line with Basel III standard. Since its introduction CCyB is set at the level of 0%. According to the Explanation of the countercyclical capital buffer rate for the Republic of Serbia (2021) "at its meeting in March 2021, the Executive Board decided to keep the countercyclical capital buffer rate at 0%, considering the following:

- guide for setting the CCyB rate: 0%;
- credit-to-GDP ratio: 80.2%;
- deviation of credit-to-GDP ratio from its long-term trend (credit-to-GDP gap): -0.04 pp" (p. 2).

According to the Expert Group of the European Systemic Risk Board, it is allowed that additional indicators be selected from country to country (Detken et al., 2014). Besides the credit-to-GDP gap from its long-term trend, additional optional indicators are taken into account for the purpose of setting the CCyB rate for Serbia such as the real estate market (real estate DOMex index and indices of the number of newly issued building permits), external imbalance (current account deficit and net foreign direct investments) and main banking sector indicators (capital adequacy ratio, non-performing loans and loan-to-deposit). The analysis of the reference indicator and additional indicators points to sustainable lending activity. Given that the estimated credit-to-GDP gap is still below its long-term trend, i.e. that this deviation is below the reference value of 2 pp, the CCyB rate for the Republic of Serbia was maintained at 0%, in order to mitigate the potential negative consequences of the pandemic on the financing of the corporates and households.

In order to improve CCyB we can propose the following suggestions:

1. In the case of emerging market economies with a more volatile behaviour, such as Serbia, the parameter value λ of 1600 could be alternatively used in order to monitor higher frequency movements in the credit cycle which can be significant.
2. It is recommended to use the Vulnerabilities Barometer, as part of the monitoring framework for cyclical risks. This could improve quantitative tools for the timely and adequate introduction and release of the CCyB rate as well as indicators that could point to risk accumulation in the financial system. Duprey & Roberts (2017) make an analysis of using the Vulnerabilities Barometer in the case of the Bank of Canada to measure financial system vulnerabilities.
3. The credit activity should be forecasted for the Republic of Serbia in order to assess the trend of the reference indicator and the moment of introduction or relaxation of the CCyB rate.
4. It is recommended that a Dashboard/Heatmap with clear alert and signalling thresholds are developed.
5. Recent analyses have found that a one-sided HP filter suffers from major ex-post revisions, although the Basel III regulations explicitly prescribe the use of a one-sided

HP filter. Edge and Meisenzahl (2011) and Alessandri, Bologna, Fiori and Sette (2015) have indicated in their analysis that the credit gap assessment based on a one-sided HP filter is subject to significant ex-post audits and thus has a major impact on the macroprudential policy decision. Thus, the "false positive" share of credit activity in GDP would affect the unnecessary tightening of this capital requirement. On the other hand, authors such as Darracq Pariès, Fahr and Kok (2019) suggest that the credit-to-GDP gap could be downward, after prolonged credit growth, to the extent that this growth causes an increase in bias in the estimated trend component. Based on an analysis by Alessandri, Bologna and Galardo (2021), it is recommended to assess the gap between credit and GDP from its long-term trend using a two-sided HP filter.

2.4. Capital buffer for a systemically important bank

Systemically important financial institutions are financial institutions whose liquidation or bankruptcy can jeopardize the functioning of part or the entire financial system. The risks affecting these institutions grow into the systemic risks of the financial system. For this reason, it is necessary to take measures regarding the special treatment of these institutions in relation to other institutions, given their importance for the stability of the entire financial system. The bankruptcy of Lehman Brothers in September 2008 and American Insurance Group (AIG) bailed during the global financial crises in 2008 have indicated how single financial intuition can influence the entire financial system (Co-Pierre, 2011).

Table 1: The list of systemically important banks in the Republic of Serbia and rates of the capital buffer rates for systemically important banks

Bank	Capital buffer rate for systemically important banks
Baca Intesa	2%
Unicredit Bank	2%
Komercijalna banka	2%
OTP banka	1%
Raiffeisen banka	1%
Erste Bank	1%
Banka Poštanska Štedionica	1%
AIK bank	1%
Vojvođanska banka	1%

Source: National Bank of Serbia

Banks determined by the National Bank of Serbia as being systemically important for the domestic economy (based on the following criteria: the “size of a bank, the importance for the economy, the importance of the cross-border activity of a bank, the interconnectedness of a bank with the financial system, substitutability of a bank in the financial system or the complexity of a bank”) (Decision on Capital Adequacy of Banks, 2021, p. 344) are obliged to maintain additional capital equal to 1% or 2% of their risk-weighted assets. The criteria and the method of their fulfilment are the basis of the

methodology for identifying systemically important financial institutions. According to the Decision on Capital Adequacy of Banks (2021) "the National Bank of Serbia reviews the capital buffer for systemically important banks and the methodology for identification of systemically important banks at least annually" (p. 344) and the last revision was in June 2020 (Table 1).

Capital Requirements Directive V requires that systemically important banks, on a consolidated, subconsolidated or individual basis, maintain a capital buffer for a systemically important bank of up to 3% of the total risk exposure amount, taking into account the criteria for the identification of the systemically important banks. That buffer shall consist of Common Equity Tier 1 capital. Taking into account this requirement in forthcoming period for the systemically important bank the possibility that Serbia uses capital buffer for a systemically important bank up to 3% of the total risk exposure can be analysed.

Conclusion

The global crisis 2007/2008 has highlighted the shortcomings of existing regulations and the need to introduce new ones in order to maintain and improve financial stability and create adequate instruments in the fight against systemic risk. Systemic risk is a risk that threatens the normal functioning of the entire financial system and due to its limitation, the function of financial stability has been developed. "One of the novelties introduced by the implementation of the Basel III standard refers to the introduction of capital buffers, which represent an additional Common Equity Tier 1 capital that banks are obliged to maintain above the prescribed regulatory minimum" (Annual Financial Stability Report, 2019, p. 15).

The capital buffers applied from June 2017 in Serbia are systemic risk buffer, capital conservation buffer, countercyclical capital buffer, and capital buffer for a systemically important bank. Systemic risk buffer is a capital buffer introduced to limit the high degree of euroisation, which increases the financial system's exposure to foreign exchange risk so that the exchange rate channel is one of the main channels of risk spillover to the financial system and real economy. Capital conservation buffer is applied to preserve the bank's capital and countercyclical capital buffer to prevent unsustainable credit growth that is not supported by economic growth. Capital buffer for a systemically important bank is used for identifying systemically important institutions whose liquidation or bankruptcy can jeopardize the functioning of parts or the entire financial system. The analysis showed that all capital buffers currently applied in Serbia have harmonized with the regulations of the European Union and the best international practice.

In addition to the application of capital buffers, in order to assess the vulnerability and resilience of the financial system, the National Bank of Serbia develops and uses various tools to adequately monitor and timely indicate systemic risks. In addition, the National Bank of Serbia conducts quarterly macroprudential stress tests of the banking sector, the aggregate results of which are made public within the Annual Financial Stability Report, providing information related to stress tests, as well as assumptions used,

projections of positions at the banking sector level and finally the effects on bank capitalization. This greatly contributes to strengthening confidence in the domestic financial system, but also to the transparency and accountability of the National Bank of Serbia in implementing its legal objectives. All this additionally contributes to the strengthening of financial stability, which, in addition to price stability, is a legally defined goal of the National Bank of Serbia.

References

Abbas, F., Butt, S., Masood, O. & Javaria, K. (2019). The effect of bank capital buffer on bank risk and net interest margin: evidence from the US. *Global Journal of Social Sciences Studies*, *5*(2), 72-87. Doi: https://doi.org/10.20448/807.5.2.72.87

Alessandri, P., Bologna, P. & Galardo, M. (2021). Financial crises, macroprudential policy and the reliability of credit-to-GDP gaps. *European Systemic Risk Board*, *114*, 1-47. Doi: https://dx.doi.org/10.2139/ssrn.3659989

Alessandri, P., Bologna, P., Fiori, R. & Sette, E. (2015). A note on the implementation of the countercyclical capital buffer in Italy. *Bank of Italy*, *278*, 1-38. Doi: https://dx.doi.org/10.2139/ssrn.2649949

Álvarez-Plata, P., & García-Herrero, A. (2008). To dollarize or de-dollarize: consequences for monetary policy. *German Institute for Economic Research (DIW) and BBVA*, *0808*, 1-34. Doi: https://dx.doi.org/10.2139/ssrn.1428828

Ayuso, J., Pérez D. & Saurina, J. (2002). Are capital buffers pro-cyclical? Evidence from Spanish panel data. *Banco de España*, 1-21.

Basel Committee on Banking Supervision. (2010, September 10). *Consultative Document: Countercyclical capital buffer proposal*. Retrieved April 10, 2021, from https://www.bis.org/publ/bcbs172.pdf

Bui, C., Scheule, H. & Wu, E. (2017). The value of bank capital buffers in maintaining financial system resilience. *Journal of Financial Stability, 33*, 23-40. Doi: https://doi.org/10.1016/j.jfs.2017.10.006

Castro, M. F. (2020). Quantitative analysis of the countercyclical capital buffer. *Federal Reserve Bank of St. Louis*, Working Paper 2019-008D, 1-50. Doi: https://doi.org/10.20955/wp.2019.008

Chen, Y. K., Ho, A. Y. F. & Hsu, C.-L. (2014). Are bank capital buffers cyclical? Evidence of developed and developing countries. *Journal of Financial Studies, 22*(3), 27-56. Doi: https://doi.org/https://doi.org/10.6545/JFS.2014.22(3).2

Co-Pierre, G. (2011). III and systemic risk regulation – what way forward?. *University of Jena and University of Halle-Wittenberg*, Working Papers on Global Financial Markets No. 17, 1-25.

Darracq Pariès, M., Fahr. S. & Kok, C. (2019, May). Macroprudential space and current policy trade-offs in the euro area. *European Central Bank Financial Stability Review*,

Retrieved April 4, 2021, from https://www.ecb.europa.eu/pub/financial-stability/fsr/special/html/ecb.fsrart201905_3~f3ff5a969e.en.html

Decision on Amending and Supplementing the Decision on Conditions and Manner of Implementing Open Market Operations (RS Official Gazette, Nos 45/2011, 34/2013, 74/2020 and 98/2020)

Decision on Capital Adequacy of Banks (RS Official Gazette, Nos 103/2016, 103/2018, 88/2019, 67/2020, 98/2020, 137/2020 and 59/2021)

Decision on the Rate and Manner of Maintaining the Systemic Risk Buffer (RS Official Gazette, No. 58/2017 and 3/2018)

Detken, C., Weeken, L., Alessi, L., Bonfim, D., Boucinha, M., Castro, C., et al. (2014). Operationalising the countercyclical capital buffer: indicator selection, threshold identification and calibration options. European Systemic Risk Board, ESRB Occasional Paper Series, No. 5, 1-95.

Drehmann, M., & Tsatsaronis, K. (2014). The credit-to-GDP gap and countercyclical capital buffers: questions and answers. *BIS Quarterly Review*, 55-73.

Drehmann, M., Borio, C., Gambacorta, L., Jiménez, G. & Trucharte, C. (2010). Countercyclical capital buffers: exploring options. *Bank for International Settlements*, Working Papers No 317, 1-64. Doi: https://dx.doi.org/10.2139/ssrn.1648946

Duprey, T., & Roberts, T. (2017). A barometer of Canadian financial system vulnerabilities. *Bank of Canada*, *2017-24*, 1-17.

Edge, M. R., & Meisenzahl, R. R. (2011). The unreliability of credit-to-GDP ratio gaps in real-time: Implications for countercyclical capital buffers. *International Journal of Central Banking*, *7*(4), 261–298. Doi: https://dx.doi.org/10.2139/ssrn.1956719

Ercegovac, D., Vlaović-Begović, S. & Jovin, S. (2019). The analysis of the key indicators of the Republic of Serbia banking sector. *Anali Ekonomskog Fakulteta u Subotici*, *55*(41), 81-94. Doi: https://doi.org/10.5937/AnEkSub1941081E

European Systemic Risk Board. (2013, April 4). *Recommendation of the European Systemic Risk Board of 4 April 2013 on Intermediate Objectives and Instruments of Macro-Prudential Policy (ESRB/2013/1)*. Retrieved April 3, 2021, from https://www.esrb.europa.eu/pub/pdf/recommendations/ESRB_2013_1.en.pdf?b3291f19e4a37b5bab77b657df7ec97d

Fonseca, A. R., & González, F. (2010). How bank capital buffers vary across countries. The influence of cost of deposits, market power and bank regulation. *Journal of Banking & Finance, 34*(4), 892-902. Doi: https://doi.org/10.1016/j.jbankfin.2009.09.020

Gabrieli, S. & Jimborean, R. (2020). Systemic risk buffer: what would this instrument be used for?. *Bulletin de la Banque de France*, *227/2*, 1-11.

García-Suaza, A. F., Gómez-González, J. E., Pabón, A. M. & Tenjo-Galarza, F. (2011). The cyclical behaviour of bank capital buffers in an emerging economy: size does matter.

Economic Modelling, *29*(5), 1612-1617. Doi: https://doi.org/10.1016/j.econmod.2012.05.021

Guidara, A., Son Lai, V., Soumaré, I. & Tchana, T. F. (2013). Banks' capital buffer, risk and performance in the Canadian banking system: impact of business cycles and regulatory changes. *Munich Personal RePEc Archive*. Paper No. 44105, 1-45.

Heid, F., & Krüger, U. (2011). Do capital buffers mitigate volatility of bank lending? A simulation study. *Deutsche Bundesbank*, Discussion Paper Series 2: Banking and Financial Studies No 03/2011, 1-22.

Jokipii, T., & Milne, A. (2006). The cyclical behaviour of European bank capital buffers. *Bank of Finland*. Research Discussion Papers, No. 17/2006, 1-41.

Law on the National Bank of Serbia (RS Official Gazette, No 72/2003 and its amendments and supplements published in the "RS Official Gazette", Nos 55/2004, 85/2005 – other law, 44/2010, 76/2012, 106/2012, 14/2015 and 40/2015 – Constitutional Court decision and 44/2018)

Lindquist, K.-G. (2003). Banks' buffer capital: How important is risk?. *Norges Bank*, Working Paper No. 2003/11, 3-19.

Montagnoli, A., Mouratidis, K. & Whyte, K. (2018). Assessing the cyclical behaviour of bank capital buffers in a finance-augmented macro-economy. *The University of Sheffield*, 1-33.

Moudud-Ul-Huq, S. (2019). Banks' capital buffers, risk, and efficiency in emerging economies: are they counter‐cyclical?. *Eurasian Economic Review*, 9, 467–492. Doi: https://doi.org/10.1007/s40822-018-0121-5

Moudud-Ul-Huq, S. (2019a). The impact of business cycle on banks' capital buffer, risk and efficiency: a dynamic GMM approach from a developing economy. *Global Business Review*, 1-20. Doi: https://doi.org/10.1177%2F0972150918817382

National Bank of Serbia. (2012, April 6). *NBS and Government Sign a Memorandum on Dinarisation Strategy*. Retrieved April 2, 2021, https://nbs.rs/en/scripts/showcontent/index.html?id=5675

National Bank of Serbia. (2015, March). *Macroprudential Framework*. Retrieved April 3, 2021, from https://nbs.rs/export/sites/NBS_site/documents-eng/finansijska-stabilnost/macroprudential_framework_201503.pdf

National Bank of Serbia. (2018, December). *Memorandum on the Dinarisation Strategy*. Retrieved April 2, 2021, from https://nbs.rs/export/sites/NBS_site/documents-eng/publikacije/dinarizacija/Memorandum_Dinarisation_Strategy_2018.pdf

National Bank of Serbia. (2019, July). *Annul Financial Stability Report 2019*. Retrieved April 4, 2021, https://www.nbs.rs/export/sites/NBS_site/documents-eng/publikacije/fs/fsr_2019.pdf

National Bank of Serbia. (2021, March). *Explanation of the countercyclical capital buffer rate for the Republic of Serbia.* Retrieved April 4, 2021,

https://www.nbs.rs/export/sites/NBS_site/documents-eng/finansijska-stabilnost/Explanation_CCB_20210315.pdf

Noreen, U., Alamdar, F. & Tariq, T. (2016). Capital buffers and bank risk: empirical study of adjustment of Pakistani banks. *International Journal of Economics and Financial Issues*, *6*(4), 1798-1806.

Puzanova, N. & Dullmann, K. (2013). Systemic risk contributions: a credit portfolio approach. *Journal of Banking & Finance*, *37* (4), 1243-1257. Doi: https://doi.org/10.1016/j.jbankfin.2012.11.017

Seidler, J., & Gersl, A. (2012). Excessive credit growth and countercyclical capital buffers in Basel III: empirical evidence from central and East European countries. *Munich Personal RePEc Archive*, Paper No. 43689, 91-107.

Stolz, S. & Wedow, M. (2005). Banks' regulatory capital buffer and the business cycle: evidence for German savings and cooperative banks. *Deutsche Bundesbank*, Discussion Paper Series 2: Banking and Financial Studies No 07/2005, 1-48.

The European Parliament and the Council of the European Union. (2013, June 27). *Directive 2013/36/EU of the European Parliament and of the Council of 26 June 2013 on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms, amending Directive 2002/87/EC and repealing Directives 2006/48/EC and 2006/49/EC*. Retrieved March 31, 2021, from https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:176:0338:0436:EN:PDF

The European Parliament and the Council of the European Union. (2019, May 20). *Directive (EU) 2019/878 of the European Parliament and of the Council of 20 May 2019 amending Directive 2013/36/EU as regards exempted entities, financial holding companies, mixed financial holding companies, remuneration, supervisory measures and powers and capital.* Retrieved April 1, 2021, from https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019L0878&from=EN

Tomuleasa, I. (2015). Macroprudential policy and systemic risk: an overview. *Procedia Economics and Finance*, *20* (2015), 645 – 653. Doi: https://doi.org/10.1016/S2212-5671(15)00119-7

Vesić, T., Ravić, N. & Đekić, M. (2019). Comparative analysis of the liquidity ratios of the largest banks of Serbia: Indicator of performance measurement. *Anali Ekonomskog Fakulteta u Subotici, 55*(42), 3-15. Doi: https://doi.org/10.5937/AnEkSub1942003V

Windischbauer, U. (2016). Strengthening the role of local currencies in EU candidate and potential candidate countries. *European Central Bank*, *170*, 1-51. Doi: https://doi.org/10.2866/140140

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Empirical study of savings through life insurance in the Republic of Serbia

Емпиријска студија штедње кроз животно осигурање у Републици Србији

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Abstract: Life is a natural course, full of uncertainty and temptation of every human being. In order to make our lives more peaceful and have a more peaceful future, we are trying in various ways to secure ourselves and make our lives safer. Savings through insurance is a life-saving type of savings that involves the material protection of an individual against the risk of premature death and loss or loss of ability to earn money. In conditions where the solidarity-based pension system is unsustainable, it is necessary to develop voluntary pension insurance and savings through life insurance, as sources of long-term savings and additional sources of financing. The subject of this research is to answer the question of what people think about saving through life insurance. The main objective of this research is to evaluate the attitude of the residents of the Republic of Serbia towards saving through life insurance. The survey was conducted on the territory of the entire Republic of Serbia, on a suitable sample of 500 respondents. Through this paper, the citizens' attitude towards saving through life insurance in the Republic of Serbia is analyzed in one place. By analyzing the data from the survey, we can conclude that the general hypothesis is confirmed: Residents are not satisfied with the current state of savings through life insurance in the Republic of Serbia.

Keywords: life, savings through life insurance, material protection, long-term savings, additional source of financing.
JEL classification: G22, G23

Сажетак: Живот је природан ток, пун неизвесности и искушења сваког човека. Да бисмо свој живот учинили мирнијим и имали мирнију будућност, на разне начине покушавамо да се осигурамо и учинимо свој живот сигурнијим. Штедња путем осигурања је врста штедње која спашава живот и укључује материјалну заштиту појединца од ризика од превремене смрти и губитка или губитка способности за зараду. У условима када је солидарни пензијски систем неодржив, неопходно је развити добровољно пензијско осигурање и штедњу кроз животно осигурање, као изворе дугорочне штедње и додатне изворе финансирања. Предмет овог истраживања је да одговори на питање шта људи мисле о штедњи кроз животно осигурање. Основни циљ овог истраживања је процена односа становника Републике Србије према штедњи кроз животно осигурање. Истраживање је спроведено на територији целе Републике Србије, на одговарајућем узорку од 500 испитаника. Кроз овај рад на једном месту се анализира однос грађана према штедњи кроз животно осигурање у Републици Србији. Анализом података из анкете можемо закључити да се потврђује општа хипотеза: Становници нису задовољни тренутним стањем штедње кроз животно осигурање у Републици Србији.

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Кључне речи: живот, штедња путем животног осигурања, материјална сигурност, дугорочна штедња, додатни извор финансирања.
ЈЕЛ класификација: G22, G23

Introduction

The most common type of insurance in the world is life insurance. In 2017, life insurance premiums accounted for about 59% of the total insurance premiums in the world. In almost every year, in the last three decades, life insurance has grown faster than non-life insurance and this trend is expected to continue in the future (Piljan et al., 2015, p. 99). In Serbia, life insurance today accounts for about 24% of the total insurance premium. Although it is still insufficient, great progress has been made in the last ten years, since for that time the share of life insurance has had few estimates. The importance of life insurance in Serbia is growing and has great potential to increase in the future.

The basic significance of a life insurance policy is that it represents insurance and savings at the same time. In addition to the function of expanding compulsory (social) insurance, life insurance plays a significant role in every economy because the payment of life insurance premiums accumulates funds that represent long-term, predetermined earmarked savings. Therefore, the policy can be used on the financial market as a security and is an important source of investment, where a significant return is achieved (Piljan et al., 2019, p. 87).

The classic products of life insurance in the event of death are about 250 years old, but similar principles are still used today, on which they were based from the beginning. In the meantime, a large number of life insurance products have been developed and the tendency to develop new products continues (Ćurčić et al., 2019, p. 25).

What affirms life insurers to take an important place in the financial system are their following important characteristics: stable flow of insurance premiums, long-term source of funds, long-term placements, time mismatch of payments and disbursements and predictability of the insured event, i.e. predictability of withdrawal (Piljan et al., 2018, p. 78). Thanks to the long-term source of funds, life insurers form such an investment portfolio which, in the first place, consists of long-term placements that carry long-term returns. Of course, the life insurer's portfolio must be designed to meet liquidity requirements.

1. Savings through life insurance

Life insurance savings refers to all insurances in which the termination or duration of life of one or more persons results in the payment of the sum insured by the insurer. These savings can be most simply defined as a contract by which the insurer undertakes to pay a certain amount or annuity to the insured person in the event of death or in the event of his survival, in accordance with the premiums collected from the insured (Marović & Avdalović, 2006, p. 133). We can also say that saving through life insurance are a specific type of insurance because it is about insuring the risk of death, so it is the most widespread form of insurance

worldwide (Marković & Jovanović, 2010, p. 17). There is almost no insurance company in the world that operates in highly developed countries, without offering savings through life insurance in its portfolio as a type of insurance. At the same time, we can say that it is the most attractive form of savings in the world because through individual life insurance, otherwise called savings insurance, almost all the money paid can be returned to you after a few years, and a certain percentage profit is also possible (Gvozdenović & Uzelac, 2018, p.37). It implies not only savings, but also the payment of compensation if something happens to the insured in the period in which the life insurance was concluded.

In some countries, people who save through life insurance are entitled to tax relief, and with the same policy they can get various loans. When we talk about saving through life insurance, we must not overlook the fact that it is a risk of death that is variable and progressively increases with age (Piljan et al., 2017, p. 395). If we assumed that the amount of the premium should follow the probability of death, which is higher and higher from year to year, we would reach extremely high amounts of premium, which the insured could not bear.

2. Life insurance in Serbia

In the current business conditions, the insurance market in Serbia is recording a positive, but relatively slow growth trend. The life insurance market in Serbia, in the last few years, has shown continuous progress, but still lags significantly behind compared to developed European countries (Knežević & Đurić, 2019, p. 42). The weak development of the life insurance sector is a direct consequence of insufficient economic development, underdevelopment of the financial market, unemployment of the population and inadequate economic reforms. A significant problem is poor education and minimal knowledge of the potential of this type of insurance.

The insurance market in Serbia is relatively stable, with a tendency to grow, but it still faces a number of problems. When it comes to life insurance, its insufficient development is most influenced by the low living standard of the population, unemployment and weak purchasing power, but also inflation and the exchange rate of the domestic currency on which the efficiency of life insurance directly depends (Kostadinović & Radojičić, 2017, p. 115) These circumstances, with the consequences of the global economic crisis, have led to the fact that the level of life insurance development is still not at the expected level. In the realization of future goals of economic growth and development, life insurance will have a significant role, both in achieving the security of the individual and the role of the institutional investor whose funds are used to finance the development of the state (Vesić et al., 2019, p. 11).

The insurance market in Serbia is in a period of relative stability. Although there is a continuous growth, if the neighboring countries are taken into account, it is noticeable that the entire insurance sector is still underdeveloped and is well below the average of the surrounding countries. Underdevelopment is even more noticeable when compared to European Union countries.

3. Examining the attitude of residents

The aim of the research is to assess the attitude of the inhabitants of the Republic of Serbia regarding the issue of savings through life insurance.

The general hypothesis is: Residents are not satisfied with the current state of savings through life insurance in the Republic of Serbia.

The research was conducted on the territory of the entire Republic of Serbia, on a suitable sample of 500 respondents. The structure of the sample is by gender: 47.6% men, 52.4% women; by age: up to 35 years of age 45.6%, over 35 years of age 54.4%; by education: secondary education 37%, basic vocational education 17.6%, university education 24.8%, master's/doctoral degree 20.6%; by length of service: up to 10 years of service 38.8%, from 11 to 20 years of service 32.6%, from 21 to 30 years of service 17%, over 30 years of service 11.6%; according to the position in the company: workers 55.2%, operational level manager 18.4%, mid-level manager 14.6% and top manager 11.8%.

The statistical method as an general scientific method dominates in the research, and the descriptive -¬ survey-research-method, as a special method. This variant of scientific description implies active involvement of respondents in providing information about the phenomena that are the subject of study, on the basis of which one can enter the essence of the research subject and determine its condition, but also discover causal connections and relationships. The SPSS (Statistical Package for Social Sciences) program was used for statistical data processing. The non-parametric statistical procedure Chi square and the contingency coefficient C were used for data processing.

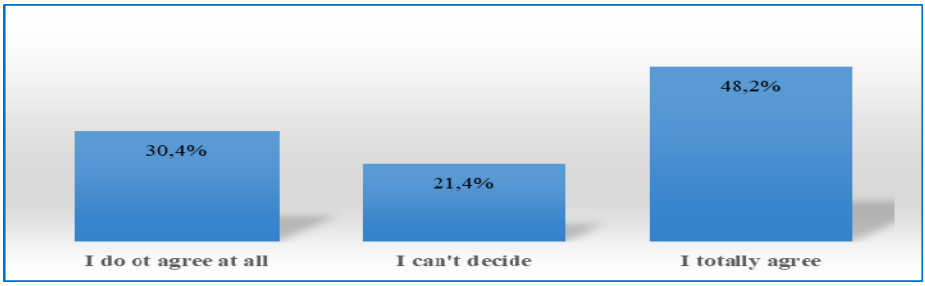
Table 1: Life insurance savings are a good form of savings

Socio-andragogical characteristics of the respondents		Life insurance savings are a good form of savings						
		1	2	3	In total		x^2 i C	p
Gender	1. Male	89	52	97	238	500 100%	x^2=12,574 C=0,157	p=0,002 p<0,05
		17,8%	10,4%	19,4%	47,6%			
	2. Female	63	55	144	262			
		12,6%	11,0%	28,8%	52,4%			
Years of life	1. Up to 35 years	54	47	127	228	500 100%	x^2=11,233 C=0,148	p=0,004 p<0,05
		10,8%	9,4%	25,4%	45,6%			
	2. Over 35 years	98	60	114	272			
		19,6%	12,0%	22,8%	54,4%			
Professional qualifications	1.Secondary education	51	46	88	185	500 100%	x²=6,035 C=0,109	p=0,419 p>0,05
		10,2%	9,2%	17,6%	37,0%			
	2. Basic vocational education	30	12	46	88			
		6,0%	2,4%	9,2%	17,6%			
	3.University education	35	28	61	124			
		7,0%	5,6%	12,2%	24,8%			
	4. Master's /Doctoral degree	36	21	46	103			
		7,2%	4,2%	9,2%	20,6%			
Years of service	1. Up to 10 years	49	37	108	194	500 100%	x^2=16,811 C=0,180	p=0,010 p<0,05
		9,8%	7,4%	21,6%	38,8%			

	2. Up 11 to 20 years	56	27	80	163			
		11,2%	5,4%	16,0%	32,6%			
	3. Up 21 to 30 years	30	24	31	85			
		6,0%	4,8%	6,2%	17,0%			
	4. Over to 30 years	17	19	22	58			
		3,4%	3,8%	4,4%	11,6%			
Position in the company	1. Worker	83	47	146	276	500 100%	x^2=16,282 C=0,178	p=0,012 p<0,05
		16,6%	9,4%	29,2%	55,2%			
	2. Basic manager	37	21	34	92			
		7,4%	4,2%	6,8%	18,4%			
	3. Middle manager	18	19	36	73			
		3,6%	3,8%	7,2%	14,6%			
	4. Top menager	14	20	25	59			
		2,8%	4,0%	5,0%	11,8%			

Source: the authors' research

Figure1: Agreement with the statement: Life insurance savings are a good form of savings



Source: Authors research

Research shows that the independent variable education is not significantly related to respondents' attitudes about life insurance savings. Namely, the value of the Chi square test and the contingency coefficient C shows (x^2 = 6,035 C = 0.109 and p = 0.419) that the length of service is not statistically significantly related to the stated attitude of the respondents, while this is not the case when it comes to gender, age, work experience and position in the company most respondents agree with the view that saving through life insurance is a good form of saving, but we have differences in attitudes. When it comes to life insurance, the young generation attaches significantly more importance and has more confidence in the data. It is certain that the respondents and labor organizations cannot solve this issue on their own, and the maximum involvement of all state apparatuses is expected in resolving this issue. This attitude of the young generation may be expected. This is exactly the period of life when you should think about solving the problem of pension insurance as much as possible.

In the second question as well, not all independent variables are statistically significantly related to the attitudes of the respondents that savings through life insurance are not sufficiently developed in our country. The value of the Chi square test and the contingency coefficient C show that the gender, age, education, work experience and position of the respondents in the company are not statistically significantly related to the stated attitude of the respondents.

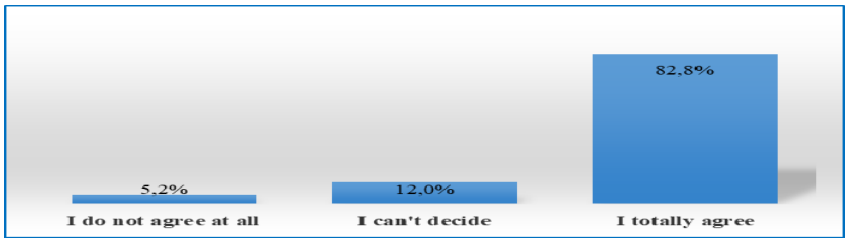
Table 2: Savings through life insurance are not sufficiently developed in our country

Socio-andragogical characteristics of the respondents		Savings through life insurance are not sufficiently developed in our country						
		1	2	3	In total		x^2 i C	p
Gender	1. Male	9	29	200	238	500 100%	x^2=1,854 C=0,061	p=0,396 p>0,05
		1,8%	5,8%	40,0%	47,6%			
	2. Female	17	31	214	262			
		3,4%	6,2%	42,8%	52,4%			
Years of life	1. Up to 35 years	11	29	188	228	500 100%	x^2=0,300 C=0,024	p=0,861 p>0,05
		2,2%	5,8%	37,6%	45,6%			
	2. Over 35 years	15	31	226	272			
		3,0%	6,2%	45,2%	54,4%			
Professional qualifications	1.Secondary education	12	21	152	185	500 100%	x^2=6,022 C=0,109	p=0,421 p>0,05
		2,4%	4,2%	30,4%	37,0%			
	2. Basic vocational education	7	14	67	88			
		1,4%	2,8%	13,4%	17,6%			
	3.University education	4	13	107	124			
		0,8%	2,6%	21,4%	24,8%			
	4. Master's /Doctoral degree	3	12	88	103			
		0,6%	2,4%	17,6%	20,6%			
Years of service	1. Up tu 10 years	6	28	160	194	500 100%	x^2=7,177 C=0,119	p=0,305 p>0,05
		1,2%	5,6%	32,0%	38,8%			
	2. Up 11 to 20 years	8	16	139	163			
		1,6%	3,2%	27,8%	32,6%			
	3. Up 21 to 30 years	6	10	69	85			
		1,2%	2,0%	13,8%	17,0%			
	4. Over to 30 years	6	6	46	58			
		1,2%	1,2%	9,2%	11,6%			
Position in the company	1. Worker	10	38	228	276	500 100%	x^2=6,203 C=0,111	p=0,401 p>0,05
		2,0%	7,6%	45,6%	55,2%			
	2. Basic manager	7	8	77	92			
		1,4%	1,6%	15,4%	18,4%			
	3. Middle manager	6	6	61	73			
		1,2%	1,2%	12,2%	14,6%			
	4. Top menager	3	8	48	59			
		0,6%	1,6%	9,6%	11,8%			

Source: the authors' research

This means that we do not have significant deviations regarding the mentioned position.

Figure 2: Agreement with the statement: Savings through life insurance are not sufficiently developed in our country



Source: the authors' research

The conclusion is that regardless of age, gender, education, work experience and position in the company, most respondents agree with the view that savings through life insurance in our country are underdeveloped.

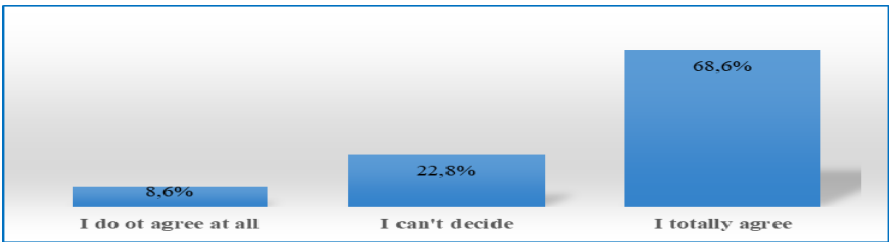
Table 3: Conditions for the development of savings through life insurance in our country are not favorable

Socio-andragogical characteristics of the respondents		Conditions for the development of savings through life insurance in our country are not favorable						
		1	2	3	In total		x^2 i C	p
Gender	1. Male	20	59	159	238	500 100%	x^2=1,022 C=0,045	p=0,600 p>0,05
		4,0%	11,8%	31,8%	47,6%			
	2. Female	23	55	184	262			
		4,6%	11,0%	36,8%	52,4%			
Years of life	1. Up to 35 years	20	55	153	228	500 100%	x^2=0,473 C=0,031	p=0,790 p>0,05
		4,0%	11,0%	30,6%	45,6%			
	2. Over 35 years	23	59	190	272			
		4,6%	11,8%	38,0%	54,4%			
Professional qualifications	1.Secondary education	15	43	127	185	500 100%	x^2=8,963 C=0,133	p=0,176 p>0,05
		3,0%	8,6%	25,4%	37,0%			
	2. Basic vocational education	11	18	59	88			
		2,2%	3,6%	11,8%	17,6%			
	3.University education	5	35	84	124			
		1,0%	7,0%	16,8%	24,8%			
	4. Master's /Doctoral degree	12	18	73	103			
		2,4%	3,6%	14,6%	20,6%			
Years of service	1. Up tu 10 years	18	47	129	194	500 100%	x^2=1,569 C=0,056	p=0,955 p>0,05
		3,6%	9,4%	25,8%	38,8%			
	2. Up 11 to 20 years	13	37	113	163			
		2,6%	7,4%	22,6%	32,6%			
	3. Up 21 to 30 years	7	20	58	85			
		1,4%	4,0%	11,6%	17,0%			
	4. Over to 30 years	5	10	43	58			
		1,0%	2,0%	8,6%	11,6%			
Position in the company	1. Worker	24	69	183	276	500 100%	x^2=9,754 C=0,138	p=0,135 p>0,05
		4,8%	13,8%	36,6%	55,2%			
	2. Basic manager	13	21	58	92			
		2,6%	4,2%	11,6%	18,4%			
	3. Middle	3	13	57	73			

	manager	0,6%	2,6%	11,4%	14,6%			
	4. Top menager	3	11	45	59			
		0,6%	2,2%	9,0%	11,8%			

Source: the authors' research

Figure 3: Agreement with the statement: The conditions for the development of savings through life insurance in our country are not favorable



Source: the authors' research

As in the previous case, the analysis of the data in Table 3, shows that not all independent variables are statistically significantly related to the respondents' opinions about the conditions for the development of life insurance. The value of the Chi square test and the contingency coefficient C show that the gender, age, education, work experience and position of the respondents in the company are not statistically significantly related to the stated attitude of the respondents. This means that we do not have significant deviations regarding the mentioned position. Based on the data from the table, we can conclude that regardless of gender, age, education, work experience and position in the company, most respondents agree with the view that the conditions for the development of savings through life insurance in our country are not favorable.

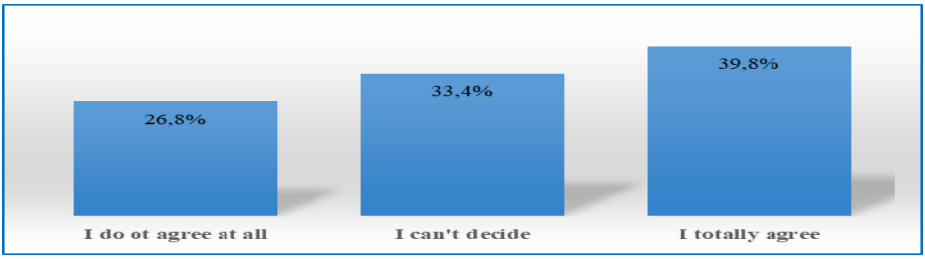
Table 4: I don't trust saving through life insurance

Socio-andragogical characteristics of the respondents		I don't trust saving through life insurance						
		1	2	3	In total		x^2 i C	p
Gender	1. Male	58	82	98	238	500 100%	x^2=1,368 C=0,052	p=0,505 p>0,05
		11,6%	16,4%	19,6%	47,6%			
	2. Female	76	85	101	262			
		15,2%	17,0%	20,2%	52,4%			
Years of life	1. Up to 35 years	58	78	92	228	500 100%	x^2=0,404 C=0,028	p=0,817 p>0,05
		11,6%	15,6%	18,4%	45,6%			
	2. Over 35 years	76	89	107	272			
		15,2%	17,8%	21,4%	54,4%			
Professional qualifications	1.Secondary education	64	56	65	185	500 100%	x^2=22,189 C=0,206	p=0,001 p<0,05
		12,8%	11,2%	13,0%	37,0%			
	2. Basic vocational education	20	27	41	88			
		4,0%	5,4%	8,2%	17,6%			
	3.University education	27	57	40	124			
		5,4%	11,4%	8,0%	24,8%			
	4. Master's /Doctoral degree	23	27	53	103			
		4,6%	5,4%	10,6%	20,6%			

Years of service	1. Up tu 10 years	54	55	85	194	500 100%	x^2=9,387 C=0,136	p=0,153 p>0,05
		10,8%	11,0%	17,0%	38,8%			
	2. Up 11 to 20 years	42	55	66	163			
		8,4%	11,0%	13,2%	32,6%			
	3. Up 21 to 30 years	18	38	29	85			
		3,6%	7,6%	5,8%	17,0%			
	4. Over to 30 years	20	19	19	58			
		4,0%	3,8%	3,8%	11,6%			
Position in the company	1. Worker	75	95	106	276	500 100%	x^2=2,356 C=0,068	p=0,884 p>0,05
		15,0%	19,0%	21,2%	55,2%			
	2. Basic manager	24	26	42	92			
		4,8%	5,2%	8,4%	18,4%			
	3. Middle manager	19	24	30	73			
		3,8%	4,8%	6,0%	14,6%			
	4. Top menager	16	22	21	59			
		3,2%	4,4%	4,2%	11,8%			

Source: Authors research

Figure 4: Agreement with the statement: I don't trust saving through life insurance



Source: the authors' research

In question no. 4 some independent variables are not statistically significantly related to the respondents' attitudes about trust in life insurance. The value of the Chi square test and the contingency coefficient C show that gender, age, work experience and position in the company are not statistically significantly related to the stated attitude of the respondents. This means that we do not have significant deviations regarding the mentioned position. Based on the data from the table, we can conclude that regardless of gender, age, work experience and position in the company, most respondents agree with the view that there is no trust in savings through life insurance.

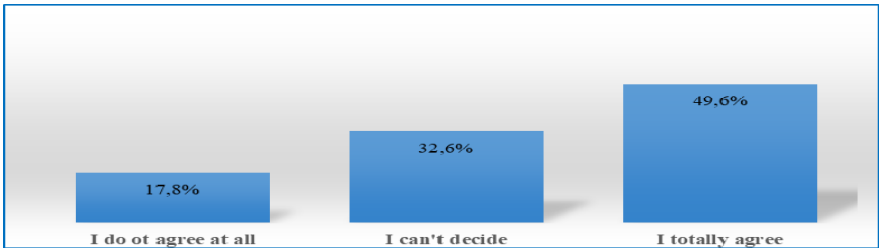
Table 5: The state does not sufficiently support the development of savings through life insurance

Socio-andragogical characteristics of the respondents		The state does not sufficiently support the development of savings through life insurance						
		1	2	3	In total		x^2 i C	p
Gender	1. Male	46	73	119	238	500 100%	x^2=5,689 C=0,047	p=0,224 p>0,05
		9,2%	14,6%	23,8%	47,6%			
	2. Female	43	90	129	262			
		8,6%	18,0%	25,8%	52,4%			

Years of life	1. Up to 35 years	43	66	119	228	500 100%	x^2=2,548 C=0,071	p=0,280 p>0,05
		8,6%	13,2%	23,8%	45,6%			
	2. Over 35 years	46	97	129	272			
		9,2%	19,4%	25,8%	54,4%			
Professional qualifications	1.Secondary education	39	63	83	185	500 100%	x^2=6,400 C=0,112	p=0,380 p>0,05
		7,8%	12,6%	16,6%	37,0%			
	2. Basic vocational education	16	28	44	88			
		3,2%	5,6%	8,8%	17,6%			
	3.University education	17	45	62	124			
		3,4%	9,0%	12,4%	24,8%			
	4. Master's /Doctoral degree	17	27	59	103			
		3,4%	5,4%	11,8%	20,6%			
Years of service	1. Up tu 10 years	38	50	106	194	500 100%	x^2=9,575 C=0,137	p=0,144 p>0,05
		7,6%	10,0%	21,2%	38,8%			
	2. Up 11 to 20 years	29	61	73	163			
		5,8%	12,2%	14,6%	32,6%			
	3. Up 21 to 30 years	10	34	41	85			
		2,0%	6,8%	8,2%	17,0%			
	4. Over to 30 years	12	18	28	58			
		2,4%	3,6%	5,6%	11,6%			
Position in the company	1. Worker	49	92	135	276	500 100%	x^2=5,855 C=0,108	p=0,440 p>0,05
		9,8%	18,4%	27,0%	55,2%			
	2. Basic manager	14	27	51	92			
		2,8%	5,4%	10,2%	18,4%			
	3. Middle manager	12	21	40	73			
		2,4%	4,2%	8,0%	14,6%			
	4. Top menager	14	23	22	59			
		2,8%	4,6%	4,4%	11,8%			

Source: the authors' research

Figure 5: Agreement with the statement: The state does not sufficiently support the development of savings through life insurance



Source: the authors' research

And in question no. 5 not all independent variables are statistically significantly related to the respondents' attitudes that the state does not sufficiently support life insurance savings. The value of the Chi square test and the contingency coefficient C show that the gender, age, education, work experience and position of the respondents in the company are not statistically significantly related to the stated attitude of the respondents. This means that we do not have significant deviations regarding the mentioned position. Based on the data from the table, we can conclude that regardless of gender, age, education, work experience and position in the company, most respondents agree with the view that the state does not sufficiently support the development of savings through life insurance.

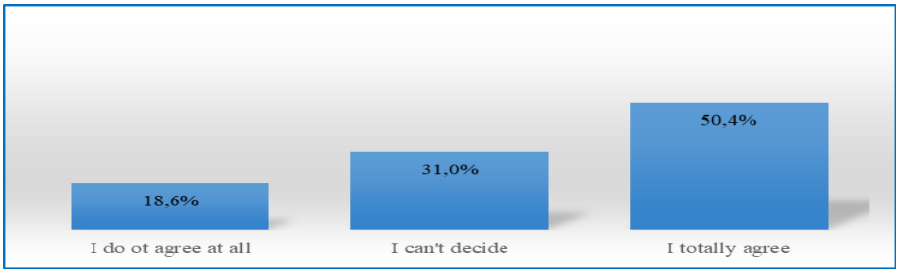
Table 6: Life insurance savings are a necessity of the modern age

Socio-andragogical characteristics of the respondents		Life insurance savings are a necessity of the modern age						
		1	3	5	In total		x^2 i C	p
Gender	1. Male	45	79	114	238	500 100%	x^2=1,292 C=0,o51	p=0,524 p>0,05
		9,0%	15,8%	22,8%	47,6%			
	2. Female	48	76	138	262			
		9,6%	15,2%	27,6%	52,4%			
Years of life	1. Up to 35 years	43	64	121	228	500 100%	x^2=1,769 C=0,059	p=0,413 p>0,05
		8,6%	12,8%	24,2%	45,6%			
	2. Over 35 years	50	91	131	272			
		10,0%	18,2%	26,2%	54,4%			
Professional qualifications	1.Secondary education	42	51	92	185	500 100%	x^2=15,230 C=0,172	p=0,019 p<0,05
		8,4%	10,2%	18,4%	37,0%			
	2. Basic vocational education	15	34	39	88			
		3,0%	6,8%	7,8%	17,6%			
	3.University education	14	48	62	124			
		2,8%	9,6%	12,4%	24,8%			
	4. Master's /Doctoral degree	22	22	59	103			
		4,4%	4,4%	11,8%	20,6%			
Years of service	1. Up tu 10 years	37	52	105	194	500 100%	x^2=13,564 C=0,163	p=0,035 p<0,05
		7,4%	10,4%	21,0%	38,8%			
	2. Up 11 to 20 years	33	57	73	163			
		6,6%	11,4%	14,6%	32,6%			
	3. Up 21 to 30 years	8	34	43	85			
		1,6%	6,8%	8,6%	17,0%			
	4. Over to 30	15	12	31	58			

	years	3,0%	2,4%	6,2%	11,6%			
Position in the company	1. Worker	56	82	138	276	500 100%	x^2=9,456 C=0,135	p=0,150 p>0,05
		11,2%	16,4%	27,6%	55,2%			
	2. Basic manager	15	27	50	92			
		3,0%	5,4%	10,0%	18,4%			
	3. Middle manager	7	24	42	73			
		1,4%	4,8%	8,4%	14,6%			
	4. Top menager	15	22	22	59			
		3,0%	4,4%	4,4%	11,8%			

Source: the authors' research

Figure 6: Agreement with the statement: Life insurance savings are a necessity of the modern age



Source: the authors' research

By analyzing the data in Table 6, we can see that some independent variables are not statistically significantly related to the respondents' opinion that saving through life insurance is a necessity of the modern age. The value of the Chi square test and the contingency coefficient C show that the gender, age and position of the respondents in the company are not statistically significantly related to the stated attitude of the respondents. This means that we do not have significant deviations regarding the mentioned position. Based on the data from the table, we can conclude that regardless of gender, age and position in the company, most respondents agree with the view that saving through life insurance is a necessity of the modern age. When it comes to education and work experience, we have deviations in agreeing with the mentioned position. Among respondents with secondary education and workers, the more dominant view is that saving through life insurance is a necessity of the modern age.

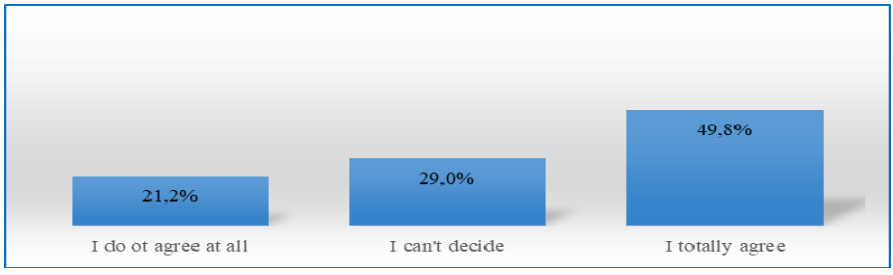
Table 7: I don't have enough money savings through life insurance

Socio-andragogical characteristics of the respondents		I don't have enough money savings through life insurance						
		1	3	5	In total		x^2 i C	p
Gender	1. Male	57	70	111	238	500 100%	x^2=2,588 C=0,071	p=0,278 p>0,05
		11,4%	14,0%	22,2%	47,6%			
	2. Female	49	75	138	262			
		9,8%	15,0%	27,6%	52,4%			
Years of life	1. Up to 35 years	50	67	111	228	500 100%	x^2=0,232 C=0,022	p=0,891 p>0,05
		10,0%	13,4%	22,2%	45,6%			

	2. Over 35 years	56	78	138	272			
		11,2%	15,6%	27,6%	54,4%			
Professional qualifications	1.Secondary education	42	42	101	185	500 100%	x^2=12,392 C=0,156	p=0,054 p>0,05
		8,4%	8,4%	20,2%	37,0%			
	2. Basic vocational education	14	38	36	88			
		2,8%	7,6%	7,2%	17,6%			
	3.University education	28	35	61	124			
		5,6%	7,0%	12,2%	24,8%			
	4. Master's /Doctoral degree	22	30	51	103			
		4,4%	6,0%	10,2%	20,6%			
Years of service	1. Up tu 10 years	37	49	108	194	500 100%	x^2=11,400 C=0,149	p=0,077 p>0,05
		7,4%	9,8%	21,6%	38,8%			
	2. Up 11 to 20 years	33	56	74	163			
		6,6%	11,2%	14,8%	32,6%			
	3. Up 21 to 30 years	26	25	34	85			
		5,2%	5,0%	6,8%	17,0%			
	4. Over to 30 years	10	15	33	58			
		2,0%	3,0%	6,6%	11,6%			
Position in the company	1. Worker	50	63	163	276	500 100%	x^2=22,642 C=0,208	p=0,001 p<0,05
		10,0%	12,6%	32,6%	55,2%			
	2. Basic manager	22	31	39	92			
		4,4%	6,2%	7,8%	18,4%			
	3. Middle manager	19	29	25	73			
		3,8%	5,8%	5,0%	14,6%			
	4. Top menager	15	22	22	59			
		3,0%	4,4%	4,4%	11,8%			

Source: Authors research

Figure 7: Agreement with the statement: I don't have enough money savings through life insurance



Source: the authors' research

The situation is the same with question no.7 where all independent variables are not statistically significantly related to the attitude of respondents that they do not have enough

money to invest in savings through life insurance. The value of the Chi square test and the contingency coefficient C show that gender, age, education and work experience are not statistically significantly related to the stated opinion of the respondents. This means that we do not have significant deviations regarding the mentioned position. Based on the data from the table, we can conclude that regardless of gender, age, education and work experience, most respondents do not agree with the view that there is not enough money savings through life insurance. When it comes to the position in the company, we have that the attitude of the workers differs from the attitude of the manager. Their more dominant attitude is that they do not have enough money to save through life insurance, which is understandably similar to their income.

Conclusion

Life insurance savings are the subject of discussion and analysis in almost all countries of the world because stable savings are one of the preconditions for economic growth and development. That is why it is important that these savings exist, regardless of whether the system can generate income sufficient to ensure a socially acceptable standard of living and their proper financing.

We can also say that saving through life insurance is a specific type of insurance because it is about insuring the risk of death, so it is the most widespread form of insurance around the world. There is almost no insurance company in the world that operates in highly developed countries, without offering life insurance savings in its portfolio as a form of insurance.

Life insurance savings in the Republic of Serbia are in a period of relative stability. Although there is a continuous growth, if the neighboring countries are taken into account, it is noticeable that this type of savings is still underdeveloped and is significantly below the average of the surrounding countries. Underdevelopment is even more noticeable when compared to European Union countries.

Through this paper, the attitude of the population in relation to savings through life insurance in the Republic of Serbia is analyzed in one place. All the above data show that the general hypothesis has been confirmed: Residents are not satisfied with the current state of savings through life insurance in the Republic of Serbia.

Through the analysis of data from the research, we come to the conclusion that the respondents believe that saving through life insurance is a good form of saving and that it is necessary. When it comes to trust, they agree that they do not trust this type of savings and that the conditions for the development of this type of savings are not favorable. They agree that the state does not pay enough attention to this type of savings. All respondents agree that they do not have enough money for this type of savings.

The general conclusion is that there is generally no significant difference in opinion regardless of gender, age, education, work experience and position of respondents in the company.

References

Ćurčić, N., Piljan, I., & Simonović, Z. (2019). Marketing concept in insurance companies *Ekonomika, 65*(3), 21-33. Doi: https://scindeks.ceon.rs/article.aspx?artid=0350-137X1903021Q

Gvozdenović, N., & Uzelac, O. (2018). Telematics and recent trends in automotive insurance and other types of insurance. *Anali Ekonmskog fakulteta u Subotici, 54*(39), 33-43. Doi: https://doi.org/10.5937/AnEkSub1839033G

Kostadinović, I., & Radojičić, J. (2017). Banking sector in the context of sustainable development. *Economics of Sustainable Development, 1*(2), 109-119.

Knežević, M., & Đurić, Z. (2019). Some aspects of insurance development in Serbia. *Ekonomika, 65*(2), 39-49. Doi: https://doi.org/10.5937/ekonomika1902039K

Marković, T., & Jovanović, M. (2010). Livestock insurance as a factor of economic stability in the agriculture. *Contemporary Agriculture*, *59*(3-4), 287-292.

Marović, B., & Avdalović, V. (2006). *Osiguranje i teorija rizika*. Beograd: Beogradska bankarska akademija.

Piljan, I., Cogoljević, D., & Piljan T. (2015). Role of insurance companies in financial market. *International Review,* (1-2), 94-102.

Piljan, I., Cogoljević, D., & Piljan, T. (2018). *Osiguranje.* Beograd: Visoka škola za poslovnu ekonomiju i preduzetništvo.

Piljan, T., Lukić, M., & Piljan I. (2019). Necessity of introduction of pension disability insurance reform. *International review*, (1-2), 82-98.

Piljan, T., Piljan, I., & Cogoljević, D. (2017). Insurance trends in Serbia from 2005 to 2015. *Vojno delo, 69*(5), 390-403. Doi: https://doi.org/10.5937/vojdelo1705390R

Vesić, T., Ravić, N., & Đekić, M. (2019). Comparative analysis of the liquidity ratios of the largest banks of Serbia: Indicator of performance measurement. *Anali Ekonomskog fakulteta u Subotici*, (42), 3-15. Doi: https://doi.org/10.5937/AnEkSub1942003V

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Financial literacy and the use of financial services in Serbia

Финансијска писменост и употреба финансијских услуга у Србији

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Abstract: Financial services industry has always drawn a lot of attention, from possible investors, those who need financing, the government and general public. Globally, financial opportunities are becoming more attractive, but also more complex. The goal of this study is to analyze the use of financial services in Serbia. We argue that financial education and literacy are preconditions for the use of financial opportunities. Research has shown that people in Serbia are not well informed about how to make sound financial decisions. The reasons why people in Serbia do not use financial products requires to a greater extent and services special attention. In order to test the differences between people in terms of how well informed they are and which services they use and why, we conducted a survey. Our results show that people with salaries higher than 100,000 RSD are well informed but not motivated to invest. Individuals with middle income do not have enough trust and think that they are not well informed about different opportunities. Additionally, we found that men are better informed than women. This paper aims to provide an overview of the use of financial services in Serbia in order to improve financial decision-making processes and understand the different financial opportunities.
Keywords: financial literacy, awareness of financial products and services, financial decisions
JEL classification: G20, G53

Сажетак: Индустрија финансијских услуга одувек привлачи велику пажњу потенцијалних инвеститора, зајмопримаца, државе и шире јавности. Генерално, финансијске услуге постају све атрактивније али и сложеније. Циљ ове студије јесте да анализира употребу финансијских услуга у Србији. Сматрамо да су финансијско образовање и финансијска писменост предуслови за коришћење финансијских могућности. Истраживања показују да већина људи у Србији није добро информисана око доношења квалитетних финансијских одлука. Потребно је посебно анализирати разлоге због којих људи у Србији не користе финансијске производе и услуге у већој мери. Како би утврдили разлике у погледу информисаности и употребе финансијских услуга, спровели смо упитник. Наши резултати показују да су људи који имају зараду већу од 100.000РСД боље информисани али недовољно мотивисани да инвестирају. Појединци са средњим нивоом примања немају довољно поверења и сматрају да нису добро информисани у погледу различитих могућности. Поред тога, резултати показују да су мушкарци боље информисани од жена. Циљ овог рада јесте да пружи преглед употребе финансијских услуга у Србији како би се

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побољшао процес финансијског одлучивања и разумеле различите финансијске могућности.
Кључне речи: финансијска писменост, познавање финансијских производа и услуга, финансијско одлучивање
ЈЕЛ класификација: Г20, Г53

Introduction

The financial services industry is vast and highly diverse. The industry's scope comprises comprehensive areas like bank management (both commercial and investment banking), investment management (different forms of investment and pension funds), insurance companies, securities investments and brokerage companies, as main areas. This industry is equally important to both companies and individuals. Having in mind all the aforementioned areas, it is obvious why it is said that financial services industry is one of the main drivers of a country's economy. It serves as arena for payments, intermediation between savers and borrowers, risk transfer, liquidity etc., to mention just a few important roles financial services industry has. With those important roles come very strict and detailed legislative and regulatory practice for all the areas of financial services industry.

Financial services are also arena with very tremendous changes happening almost continually. The need for innovation is a must for all industries today, and financial services are not exception; on the contrary. Due to constant changes and innovations, financial services industry is reshaping the way it offers and distributes its services to customers. Those activities are not a one-time event, but constant urge for innovation "that will shape customer behaviors, business models, and the long-term structure of the financial services industry" (World Economic Forum, 2015).

When we talk about innovation in financial services industry, first we think of fintech innovation. Fintech (financial technologies) innovation refers to application of technologies in financial services industry. Therefore, Fintech combines financial services with technological development to help both individuals as well as all kind of business – from start-ups to big companies. Fintech changes the way those categories use financial services. Thanks to mobile devices, Internet, software, cloud services etc., we do not use financial services traditionally anymore. Fintech brought us financial services in a faster, more convenient and improved manner.

Considering financial services in Serbia, there are all types of financial institutions that offer different financial services. But, the development of financial institutions is not equal, in the sense that some of the financial institutions, especially banks, are far bigger than others. If we take into consideration total financial assets financial institutions in Serbia manage, then the situation is as follows: banks hold 89,2% of total assets, insurance companies 6,6%, financial leasing 2,3%, voluntary pension funds 1% and investment funds 0,9% (National Bank of Serbia, 2019; Republic of Serbia Securities Commission, 2019). It is obvious from those facts that Serbia belongs to those countries that are very bank-oriented. We could conclude that traditional financial services offered by banks still dominate in Serbia.

Further in the paper we will present findings from our case study, considering financial services performance in Serbia.

1. Literature review

One of the goals of this study is to analyze how well people in Serbia are informed about opportunities in the market and how they make financial decisions. More precisely, we focused on financial literacy. Financial literacy can be defined as people's ability to process and make informed decisions about financial planning, wealth management, investments, pension plans and loans. Remund (2010) argues that "financial literacy is a measure of the degree to which one understands key financial concepts and possesses the ability and confidence to manage personal finances through appropriate short-term decision-making and sound, long-range financial planning." Moreover, financial literacy measures how well people understand and use personal finance-related information (Huston, 2010).

Although financial literacy is one of the crucial elements of responsible and controlled financial behavior, it does not guarantee appropriate and profitable financial decisions. The success of financial decisions depends not only on financial literacy but also on impulsiveness, behavioral biases, unusual preferences and numerous external circumstances (Huston, 2010).

The conventional economic approach suggests that people are fully rational, well-informed and that they will always make optimal decisions. This means that people will be able to save money and take responsibilities in terms of their investments. The truth is that this approach is far from reality. Generally speaking, people do not have basic financial knowledge which is very important for making complex financial decisions.

Nowadays financial decisions are very personalized, and people should be very careful in order to organize their finances in the best possible way. On the contrary, in the past, financial decisions (e.g. pension plans, savings, investments etc.) were initiated and managed by governments and companies. Employees devoted little attention to their financial decisions, especially to pension plans (Fernandes et al., 2014). The reason for this is low level of education in terms of financial opportunities and optimal investments or savings plans. There is an ongoing discussion on how to accumulate financial knowledge early in life even if there is no opportunity for complex financial decisions thereafter.

On the one hand, financial literacy has many advantages. For instance, people with strong financial skills have better results in job planning and savings (Lusardi & Mitchell, 2014). Risk awareness is one of the characteristics of financially savvy investors who always try to invest in several ventures and diversify financial risks (Abreu & Mendes, 2010). On the other hand, financial ignorance comes with significant costs. People who do not understand basic financial concepts usually have problems with higher interest rates and transaction fees (Lusardi & Tufano, 2015). Additionally, they borrow more and save less money (Stango & Zinman, 2009). Finally, Huston (2010) summarizes: "people with low financial literacy are more likely to have problems with debt (Lusardi & Tufano 2009), less likely to participate in the stock market (van Rooij et al., 2011), less likely to choose mutual

funds with lower fees (Hastings & Tejeda-Ashton, 2008), less likely to accumulate wealth and manage wealth effectively (Hilgert et al., 2003) and less likely to plan for retirement (Lusardi & Mitchell, 2006)".

Different research studies on financial literacy have shown that numerous people all around the world are financially illiterate (Hilgert et al., 2003). The study shows that one out of three adults is financially literate. Women, the poor and lower educated respondents show the lowest level of financial literacy, and the results remain the same regardless of the development of the country. People who use different financial services have better financial skills. Therefore, financial knowledge is related to financial services in two directions: higher financial literacy lead to the usage of financial services, and different financial services, such as a bank account or loan, motivate people to improve their financial knowledge. Nevertheless, there is a view that financial literacy is not linked to simple decisions such as having a bank account but rather to complex portfolio decisions which come with high levels of risk (Christelis et al., 2010). On the other hand, Hilgert et al. (2003) point out that there is a strong correlation between financial literacy and day-to-day financial management skills. Results from different studies show that people who are better at solving mathematical problems and who are financially literate are also more likely to participate in financial markets and invest in different financial instruments (Christelis et al., 2010; van Rooij et al., 2011). In terms of complex financial decisions, what matters most are analytical skills and the capacity to do calculations (Hilgert et al., 2003).

In terms of financial education programs there are two streams of research. Some researchers suggest that costs of financial education programs are higher than the potential benefits (Mandell & Klein, 2009). On the other hand, there is evidence that education programs are highly effective because they lead to optimal financial plans and, therefore, to positive financial outcomes (Fox et al., 2005).

Numerous studies suggest positive relationship between the level of education and financial literacy and emphasize differences in financial knowledge through education. People with college degrees, in comparison to those who did not continue formal education after high school, are more likely to use financial instruments in order to make better financial decisions (Lusardi & Mitchell, 2007). In addition, it has been shown that financial literacy depends on the financial education of their parents. It might be beneficial for children to be aware of their parents' savings and investments (Lusardi et al., 2010).

In the wake of the global financial crisis, policy makers and people from the financial industry show deep concern about financial literacy especially in youth. Younger generations have much more opportunities such as exotic mortgage forms, expended and new borrowing options and investments in innovative solutions tightly linked to technological development. Moreover, new generations have a very strong desire to be successful, to have freedom and flexibility. They have high self-esteem and expectations which are used as the main drivers of change. Moreover, the value of money, risk averseness and motivation for success influence the use of financial services especially for youth. Nga et al. (2010) point out that the lack of financial awareness in financial services

and products is present within new generations. In the past, people used to be savvy, better educated and prepared to take higher risk.

Not many studies analyze the awareness of financial products and services, especially in emerging countries such as Serbia. Complexity of transactions in the underdeveloped financial markets and lack of transparency lead to lower levels of trust and financial awareness. Boyd et al. (1994) argue that low-income families do not have enough experience or knowledge to choose the best possible financial options. Results show that low-income families rely solely on word of mouth when they have to make any financial decision. Contrary, high-income families are focused on interest rates and savings accounts and emphasize the importance of the friendly approach of financial experts.

The study implies that there is room for improvement in terms of financial awareness in Serbia. Financial institutions should have a proactive and socially responsible role. Boyd et al. (1994) argue that the reputation of financial institutions, clear and direct communication in terms of interest rates on loans and savings, and availability of information have more importance than other criteria. Not only is financial literacy important for individuals but also for the sector of small and medium enterprises and corporate world (Drexler et al., 2014).

2. Sample and procedure

This survey tests financial service awareness in Serbia. A questionnaire was developed, and pilot tested before the formal data collection. The questionnaire comprises two parts with 10 questions totally. The first part of the questionnaire refers to demographic review of the respondents. It consists of questions regarding gender, age, marital status, housing issue and education. The second part encompasses questions regarding respondent's financial services awareness in Serbia. After the question concerning working in private or public institution, the remaining questions in this part refer to income, types of financial services currently or previously used, and awareness of different types of financial services in Serbia, as well as perception of less or not using the financial services in Serbia. Whenever possible, measurement items were adapted from existing scales in literature. Some modifications were made to align the scales with the Serbian context. The response rate was 62%, corresponding to a sample size of 217 cases out of the 350 questionnaires successfully sent out using Google Forms.

3. Results

The financial services awareness scale was created using the five-point Likert-type scale that ranges from 1 (totally unaware) to 5 (totally aware). The question components for the construct of the scale, as well as its descriptive statistics, are listed in Table 1. The Cronbach alpha coefficient is 0.916 which points to an excellent internal consistency of a scale.

Table 1: Financial services awareness scale descriptive statistics and its components

Scale	Financial services awareness
Min	5
Max	25
Average	13.37
SD	5.669
Median	13
Cronbach alpha	0.916
Components	1. Insurance companies 2. Investment funds 3. Voluntary pension funds 4. Belgrade Stock Exchange 5. Bonds

Source: the authors' research

The following table gives the results of Kendall's tau correlation test, which is used to test the correlations among ordinal scaled data.

Table 2: Kendall's tau correlation coefficients for financial services awareness components

	Investment funds	*Voluntary pension funds*	*Belgrade Stock Exchange*	*Bonds*
Insurance companies	0.597***	0.622***	0.493***	0.475***
Investment funds		0.620***	0.617***	0.623***
Voluntary pension funds			0.542***	0.545***
Belgrade Stock Exchange				0.862***

*p<0.05 **p<0.01 ***p<0.001

Source: the authors' research

All correlations are significant on a 0.001 level. The values indicate middle to strong concordance among financial services awareness components. The correlations between *Insurance companies* and *Belgrade Stock Exchange* awareness (0.493) and between *Insurance companies* and *Bonds* awareness (0.475), as well as between *Voluntary pension funds* and *Belgrade Stock Exchange* awareness (0.542) and between *Voluntary pension funds* and *Bonds* awareness (0.545) are of middle strength, while others are strong correlations. The strongest concordance appears between *Belgrade Stock Exchange* and *Bonds* awareness (0.862).

Table 3 gives the results of Mann-Whitney and Kruskall-Wallis tests for the scale *Financial services awareness*. The nonparametric tests were used since the variable is not normally distributed.

According to the results given in Table 3, there is a significant difference between men and women regarding the financial services awareness in Serbia (MW, $p<0.001$). Men (Me=15) are generally more aware and more familiar with the financial services than Women (Me=10).

Table 3: The results of Mann-Whitney and Kruskall-Wallis tests for Financial services awareness

Groups by	Financial services awareness		
Gender	**Mean rank**	**Median**	**Mann-Whitney Sig.**
Male	125.88	15	<0.001
Female	95.61	10	
Salaries (RSD)	**Mean rank**	**Median**	**Kruskall-Wallis Sig.**
less than 35 000	88.64	10	0.003
35 000 – 55 000	90.03	10	
55 000 – 75 000	106.86	13	
75 000 – 100 000	100.81	13	
more than 100 000	128.88	15	

Source: the authors' research

When it comes to salaries, people that make less than 55,000 RSD a month are the least aware about the possibilities of financial services in Serbia (Me=10). People that make 55,000 to 100,000 RSD are a bit more familiar with the financial services (Me=13), while people that make more than 100 000 are the most familiar with the financial services in Serbia (Me=15). This difference is significant on 0.01 level (KW, p=0.003). The explanation could be given in a fact that people that make most money are more frequently contacted by the bank operators and informed about the possibilities of these services. Ironically, they most commonly do not use these services because of their lack of interest (Table 4).

*Table 4: Crosstabs Salaries * Reasons for not using financial services*

	Lack of awareness	**Indifference**	**Distrust**	**Lack of finances**	**Other**
less than 35 000	23.8%	9.5%	4.8%	52.4%	9.5%
35 000 – 55 000	25.0%	30.8%	23.1%	19.2%	1.9%
55 000 – 75 000	28.0%	20.0%	32.0%	20.0%	0.0%
75 000 – 100 000	18.8%	28.1%	28.1%	15.6%	9.4%
more than 100 000	16.1%	43.7%	16.1%	11.5%	12.6%

Source: the authors' research

According to the crosstabs results, there is a concordance between the amount of money that people make and reasons for not using financial services in Serbia. The value of Crosstabs Likelihood Ratio test is 39.551, and is significant on 0.001 level (p=0.001). It can be noted from Table 4 that people that make least amount of money mostly do not use financial services because of the lack of finances. People that earn medium amounts of money in Serbia mostly do not use financial services because of distrust in the financial system, while people that make the most money are simply indifferent and not interested in these services.

Conclusion

Financial services industry is perceived as one of the main drivers of a country's economy. Being equally important to both companies and individuals, financial services industry has always drawn a lot of attention, from possible investors, those who need financing,

government and general public. Globally, financial opportunities are becoming more diverse, attractive and, on the other hand, more complex.

In this paper we start from the hypothesis that financial education and literacy are preconditions for the use of financial opportunities. Generally speaking, financial literacy leads to optimal decision making about borrowing money, investments, pension plans, participation in the financial markets etc. This study aims to provide an overview of the use of financial services in Serbia in order to improve financial decision-making processes and understand the different financial opportunities.

Not many studies analyze the awareness of financial products and services, especially in emerging countries such as Serbia. Underdeveloped financial markets and lack of transparency lead to lower levels of trust and financial awareness in markets like Serbia.

Survey results show that the amount of money that people make and reasons for not using financial services in Serbia are very much in concordance. Our results show that people with salaries higher than 100,000 RSD (app. 850€) are well informed but not motivated to invest. Individuals with middle income do not have enough trust and think that they are not well informed about different opportunities. People that make the least money mostly do not use financial services because of the lack of finance. Additionally, we found that men are more informed than women.

This study indicates that there is possibility for improvement in terms of financial awareness in Serbia. Having in mind that financial services industry is a motor for the economy, it is essential for the financial institutions to understand and to play a proactive and socially responsible role. Together with the regulators they should work on financial literacy and education, from early stage of education and on creating trust in financial services industry in Serbia.

References

Abreu, M., & Mendes, V. (2010). Financial literacy and portfolio diversification. *Quantitative finance*, *10*(5), 515-528. Doi: https://doi.org/10.1080/14697680902878105

Boyd, W. L., Leonard, M., & White, C. (1994). Customer preferences for financial services: an analysis. *International Journal of Bank Marketing*, *12*(1), 9-15.

Christelis, D., Jappelli, T., & Padula, M. (2010). Cognitive abilities and portfolio choice. *European Economic Review*, *54*(1), 18-38.

Drexler, A., Fischer, G., & Schoar, A. (2014). Keeping it simple: Financial literacy and rules of thumb. *American Economic Journal: Applied Economics*, *6*(2), 1-31. Doi: https://doi.org/10.1257/app.6.2.1

Fernandes, D., Lynch Jr., J. G., & Netemeyer, R. G. (2014). Financial literacy, financial education, and downstream financial behaviors. *Management Science*, *60*(8), 1861-1883. Doi: https://doi.org/10.1287/mnsc.2013.1849

Fox, J., Bartholomae, S., & Lee, J. (2005). Building the case for financial

education. *Journal of consumer affairs*, *39*(1), 195-214. Doi: https://doi.org/10.1111/j.1745-6606.2005.00009.x

Hastings, J. S., & Tejeda-Ashton, L. (2008). *Financial literacy, information, and demand elasticity: Survey and experimental evidence from Mexico* (No. w14538). National Bureau of Economic Research. Doi: https://doi.org/10.3386/w14538

Hilgert, M. A., Hogarth, J. M., & Beverly, S. G. (2003). Household financial management: The connection between knowledge and behavior. *Fed. Res. Bull*., 89, 309-322.

Huston, S. J. (2010). Measuring financial literacy. *Journal of Consumer Affairs*, *44*(2), 296-316. Doi: https://doi.org/10.1111/j.1745-6606.2010.01170.x

Lusardi, A., & Mitchel, S. O. (2006). *Financial Literacy and Planning: Implications for Retirement Wellbeing* (Vol. 1). Pension Research Council Working Paper. Doi: https://doi.org/10.2139/ssrn.1695146

Lusardi, A., & Mitchell, O. S. (2014). The economic importance of financial literacy: Theory and evidence. *Journal of economic literature*, *52*(1), 5-44. Doi: 10.1257/jel.52.1.5

Lusardi, A., & Tufano, P. (2015). Debt literacy, financial experiences, and overindebtedness. *Journal of Pension Economics & Finance*, *14*(4), 332-368. Doi: https://doi.org/10.1017/S1474747215000232

Lusardi, A., Mitchell, O. S., & Curto, V. (2010). Financial literacy among the young. *Journal of consumer affairs*, *44*(2), 358-380. Doi: https://doi.org/10.1111/j.1745-6606.2010.01173.x

Mandell, L., & Klein, L. S. (2009). The impact of financial literacy education on subsequent financial behavior. *Journal of Financial Counseling and Planning*, *20*(1), 15-24.

National Bank of Serbia. (2019). Annual reports of banks for 2019. Retrieved July 5, 2021, from https://www.nbs.rs/export/sites/NBS_site/documents-eng/kontrola banaka/quarter_report_IV_19.pdf

National Bank of Serbia. (2019). Annual reports of insurance companies for 2019. Retrieved July 5, 2021, from https://www.nbs.rs/export/sites/NBS_site/documents-eng/osiguranje/izvestaji/insurance_IV_2019.pdf

National Bank of Serbia. (2019). Annual reports of leasing for 2019 respectively. Retrieved July 5, 2021, from https://www.nbs.rs/export/sites/NBS_site/documents-eng/lizing/izvestaji/FL_IV_2019.pdf

National Bank of Serbia. (2019). Annual reports of voluntary pension funds for 2019. Retrieved July 5, 2021, from https://www.nbs.rs/export/sites/NBS_site/documents-eng/dpf/izvestaji/vpf_IV_19.pdf

Nga, J. K., Yong, L. H., & Sellappan, R. D. (2010).
A study of financial awareness among youths. *Young Consumers*, *11*(4), 277-290. Doi: https://doi.org/10.1108/17473611011093916

Remund, D. L. (2010). Financial literacy explicated: The case for a clearer definition in an increasingly complex economy. *Journal of Consumer Affairs*, *44*(2), 276-295. Doi: https://doi.org/10.1111/j.1745-6606.2010.01169.x

Republic of Serbia Securities Commission. (2019). Annual Activity Report 2019. Retrieved July 5, 2021, from https://www.sec.gov.rs/index.php/en/about-us/internal-documents/commission-reports (Serbian version).

Stango, V., & Zinman, J. (2009). Exponential growth bias and household finance. *The Journal of Finance*, *64*(6), 2807-2849. Doi: https://doi.org/10.1111/j.1540-6261.2009.01518.x

Van Rooij, M., Lusardi, A., & Alessie, R. (2011). Financial literacy and stock market participation. *Journal of Financial Economics*, *101*(2), 449-472. Doi: https://doi.org/10.1016/j.jfineco.2011.03.006

World Economic Forum. (2015). The Future of Financial Services; How disruptive innovations are reshaping the way financial services are structured, provisioned and consumed. p. 13. Retrieved July 2, 2021, from Doi: http://www3.weforum.org/docs/WEF_The_future__of_financial_services.pdf

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Are digital financial payments constrained by the country's income? Evidence from the Global Findex database[1]

Да ли су дигитална финансијска плаћања ограничена дохотком земље? Искуства на основу базе података Global Findex

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Abstract: The combined effect of ICT improvement, digitalization and change in clients' habits lead to changes in the financial sector worldwide. Increased use of digital financial services (DFS) is a change that might help to increase financial inclusion, which is particularly important for developing countries. As income is considered a critical driver of digital payments, this study aims to determine whether there is a linear relationship between a country's income measured by the level of Gross National Income per capita (GNI p.c.) and the use of digital payment services, i.e., making and receiving digital payments. We used data from the Global Findex and World Bank databases for 2017 to conduct the research, which covered 141 countries. The presence of a linear relationship between the level of GNI p.c. and the use of digital payments was tested using correlation analysis. The results of the correlation analysis show that there is a significant strong positive linear relationship between the level of GNI p.c. and the use of digital payment services in both segments, i.e., making and receiving payments. Findings are consistent with previous research and confirmed the important role of income as a driver of the use of DFS.
Keywords: digital payments, digital financial services, income, The Global Findex database, development
JEL classification: G20, O00

Сажетак: Комбиновани ефекат побољшања ИКТ, дигитализације и промене навика клијената довео је до промена у финансијском сектору широм света. Повећана употреба дигиталних финансијских услуга је промена која би могла помоћи у повећању финансијске инклузије, што је посебно важно за земље у развоју. Како се приход сматра критичним покретачем дигиталних плаћања, ова студија има за циљ да утврди да ли постоји линеарна веза између прихода земље мерена нивоом бруто националног дохотка по глави становника и употребе дигиталних платних услуга, тј. извршавања и примања дигиталних плаћања.

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За спровођење истраживања које је обухватило 141 земљу, коришћени су подаци из *Findex* базе и базе података Светске банке за 2017. годину. Присуство линеарне везе између нивоа БНД-а по глави становника и коришћења услуга дигиталних плаћања тестирано је помоћу корелационе анализе. Резултати корелационе анализе показују да постоји значајна јака позитивна линеарна веза између нивоа БНД-а по глави становника и коришћења услуга дигиталног плаћања у оба сегмента, тј. извршавања и примања дигиталних плаћања. Налази су у складу са претходним истраживањима и потврдили су важну улогу прихода као покретача употребе дигиталних финансијских услуга.

Кључне речи: дигитална плаћања, дигиталне финансијске услуге, доходак, *Findex* база података, развијеност
ЈЕЛ класификација: G20, O00

Introduction

Ongoing technology progress has significantly changed the landscape of global finance. Rapid technological development results in the availability of a large amount of information in digital form (Spalević et al., 2019). Better Internet accessibility and an increase in the use of mobile devices (computers, mobile phones and tablets) have imposed a redefinition of financial institutions business strategies, shifting the focus to digital payments and platforms. The data from the World Bank show the growing trend in the global number of Internet users. Around 6.5 percent of the world's population used the Internet in 2000; by 2005, that number had risen to 15.8 percent, and by the end of 2018, it had increased to 51 percent (https://data.worldbank.org/indicator/IT.NET.USER.ZS). On the other hand, the number of owners of smartphone increased by as much as three times in 2018 (3.2 billion) compared to 2012 (1.06 billion) (https://www.statista.com/statistics/330695/number-of-smartphone-users-worldwide/).

Also, the percentage of households that have a personal computer increased from 27.3% in 2005 to 48.8% in 2018. In addition, predictions about the number of mobile devices suggest a growing trend, as it is expected that by 2024 there will be about 17 billion mobile devices worldwide or around 2.1 devices per person. That is an increase of as many as 3 billion devices compared to 2020. Based on the available projections (https://www.statista.com/statistics/245501/multiple-mobile-device-ownership-worldwide/ ; https://www.worldometers.info/world-population/world-population-projections/), we can conclude that the average annual growth rate of the number of mobile devices in the period 2020-2024 will be higher than the average annual growth rate of the world population. All of the above points to the fact that smart and mobile devices are becoming increasingly important in everyday life, which indicates that changes in the distribution of financial services are inevitable and are already happening. As the data presented so far suggest greater opportunities and use of digital payments, we should emphasize the estimates of the International Telecommunication Union - ITU (2018) showing that slightly less than 50% of the population in developing countries do not own mobile phone. This issue prevents them from accessing any digital services using mobile devices.

The above mentioned trends change the nature of the distribution of financial services and contribute to the development of modern solutions that can satisfy clients' financial needs. Bank clients can use the Internet and mobile devices to take an insight into

the account balance, make digital payments, transfer funds between accounts, receive payments, etc. This has led to a change in bank clients' behaviour reflected in a reduction in the number of their physical visits to branches. A basic prerequisite for using financial services is owning an account in a financial institution, most often a bank. The distribution of the number of financial accounts differs between countries and depends on numerous factors, country's income status being one of the important ones among them. Having in mind that according to the Global Findex database, 87% of respondents from low-income countries did not have financial institution account in 2011, it is obvious that this is one of the greatest barriers for using digital financial services. This negative trend is changing, and according to the same source, the number of account owners is increasing, and 76% of individuals from low-income countries did not have an account in 2017. On the other hand, residents from high-income countries showed significantly higher interest in using bank accounts given that 88% (in 2011) and 94% (in 2017) of respondents, respectively, stated that they had a financial account during the research period (Demirgüç-Kunt et al., 2018).

Recently, there has been a growing interest in conducting transactions digitally. In this regard, it is important to create appropriate digital security mechanisms for our society (Aryamov et al., 2019) given the dangers of crime in the digital space. According to the Bank for International Settlement (BIS), the average number of digital payments in the member countries of the Committee on Payments and Market Infrastructures (CPMI) increased from 176 per capita in 2012 to 303 per capita in 2019. Parallel to this, the value of digital payment transactions amounted to 3,859 billion dollars globally in 2019, with China being the largest market in the world in the field of digital payments (41.36% of total transactions value). During the same period, cash payments decreased by about 30% in developed countries, while in the case of developing countries they continued to grow.

The reduction of physical visits to bank branches is confirmed by several surveys conducted in the different economic surroundings. Research conducted on the US bank clients during 2019 revealed that they preferred mobile banking services (42% of respondents) and digital experience via computer (27%), while about 30% of respondents preferred going to a bank branch (Coconut Software and WBR Insights, 2019). Another study covering seven CEE countries showed that clients preferred the combination of digital channels and bank visits. In Serbia and Croatia, where bank visits predominated, the combination of digital and branch communication with the bank is the fastest-growing approach (Erste Group, 2019).

This paper is structured as follows. After the analysis of the relevant literature related to digital financial services (DFS), including income as a vital factor that influences the use of DFS, we examined the relationship between the use of the digital payment services and the level of GNI per capita using correlation analysis. The results of our analysis confirmed that income plays an important role in the use of DFS given that the authors found a strong positive correlation between the country's income measured by GNI p.c. and the use of digital payment services. The last segment of this paper includes the main conclusion and recommendations for further research.

1. Literature review and hypotheses

Digital financial services (DFS) can be defined as financial services which are based on digital technologies (Pazarbasioglu, 2020). DFS include products and services that allow users to have a transaction account and make payments, savings, loans, and insurance. Digital channels include mobile banking (m-banking), online banking (e-banking), mobile wallet (mobile money), ATMs (only funds transfer and bill payment), POS terminals, and other digital systems (Alliance for Financial Inclusion, 2016; Kambale, 2017). According to Jokić et al. (2019) one of the greatest IT achievements related to financial services is mobile banking. In this research, we use the definition of digital payments by Agur et al. (2020) as a non-cash transaction performed through digital channels. Depending on local regulations, providers of digital financial services can be banks, other financial institutions, and licensed non-banking intermediaries. In many countries, banks are the key actors in providing digital financial services (International Telecommunication Union – ITU, 2017). DFS's potential is built on multiple advantages, including lower costs, faster transactions, overcoming geographical barriers to access services, offering security and transparency, and the possibility to customise and construct services adapted to the clients' needs. DFS are also significant in overcoming barriers that exist on the bank side (e.g., high operating costs, limited competition, geographic barriers, etc.) (Pazarbasioglu, 2020; Klapper & Singer, 2014).

Financial inclusion refers to accessing and using formal financial services (Ljumović & Pavlović, 2021). It is related to the provision of affordable, accessible, and relevant financial products and services to individuals and firms (Kumar & Mohanty, 2011), regardless of age, gender, social status, net worth, or company size. Many countries now consider digital financial services to be the most important method for financial inclusion (ITU, 2017; World Development Report, 2016; Demirgüç-Kunt et al., 2018). The development of fintech ecosystems is important for improving financial inclusion in emerging economies. However, there are significant heterogeneities in terms of gender, age, education, and socioeconomic status across populations (Lyons et al., 2020:1), which should also need to be considered when analysing the use of digital financial services. Financial inclusion is one of the critical elements to ending poverty (Oz-Yalaman, 2019), where digital financial services represent a key factor that can stimulate economic growth and reduce income inequality. Countries with a higher level of financial system development are considered to have a greater poverty reduction and lower income inequality (Pazarbasioglu, 2020). Income inequality varies among countries. Findings from a study observing 105 countries showed that, in general, developing countries are high inequality countries, while typically developed countries represent low inequality countries (Keskin, 2017). In addition, Aad & Young (2020) stated that the share of digital payments is an important indicator of economic development.

According to the OECD, key factors that influence the development of the digital economy (digitalization) in developing countries are ICT infrastructure, ICT skills, finance, regulation, and the interaction between them (Dahlman et al., 2016). Digitalization has not bypassed the banking sector, with the highest level of activities in the most developed

economies (Druhov et al., 2019). The affordability of the Internet plays an important role in digitalization and thus in accessing digital financial services. The combined effect of geographical, physical, and economic constraints has resulted in problems with the Internet in developing countries. Hence, the Internet should be cheaper and more available (Dahlman et al., 2016) to achieve greater use of DFS.

Digitalization and innovations are related concepts, as financial innovations characterized and shaped the banking sector as we know it today. The pioneer in innovations across the globe were actors from the developed countries, and consequently, developing countries have a longer time-lag in adopting innovations (Bara, 2016). Even though this lag was reduced over time, the developing countries are still behind in terms of widespread technological diffusion (Comin & Mestieri, 2018). Developed countries are at a more advanced development stage of digital channels such as e-banking and m-banking compared to the developing countries, consequently, it is considered that there are differences in acceptance of these services by citizens (Abdinoor & Mbamba, 2017; Bryson & Atwal, 2013). In terms of countries' geographical distribution vis-à-vis individuals' engagement in m-banking, Asia-Pacific region stands out in both usage and intention to use mobile service (Nielsen, 2016). In Serbia, m-banking usage and payments show a strong and persistent rise in recent years (Lukić & Živković, 2017). In Serbia, perceived security represents one of the major factors which significantly influence the intention to use m-banking (Antonijević et al., 2021) as well as the attitudes towards internet banking (Filipović, 2019).

The primary reason influencing the time-lag and slower diffusion of innovation is the country's income level. Baliamoune-Lutz (2003) revealed more than two decades ago that ICT diffusion in developing countries is limited by income per capita. Earlier studies found that income increase is usually positively associated with the adoption of innovation (Karjaluoto et al., 2002; Lee et al., 2002). These findings are confirmed by Kolodinsky et al. (2004, p. 250) who found that those with higher income had a higher intention probability to adopt e-banking technologies and Sulaiman et al. (2007, p. 163) who stated that income level is significantly associated with the adoption of mobile banking. Also, an increase in per capita income can be considered as one of the crucial drivers of digital payments (Herwadkar et al., 2019).

Based on all the above, the following hypotheses were developed:

H1: There is a significant positive relationship between the level of GNI p.c. and the use of digital payment services

H1a: There is a significant positive relationship between the level of GNI p.c. and the percentage of those who made digital payments

H1b: There is a significant positive relationship between the level of GNI p.c. and the percentage of those who received digital payments

2. Methodology and results

To identify the differences between a country's income and using DFS, we used the World Bank Global Findex database. This database provides publicly available data related to savings, lending, payment, and risk management of adult residents (aged 15 and over). Data are collected every three years, starting from 2011. The research was initiated by the foundation of Bill & Melinda Gates (https://globalfindex.worldbank.org/). The research is based on the World Bank Global Findex database for 2017 since the latter is not available. The analysis covered 141 countries around the world. Based on collected data, we calculated that the global average percentage of inhabitants who made digital payments in the past 12 months from the day of the survey was 46.41%, while 40.08% received digital payments.

To examine the association between the country's income, i.e., the level of GNI p.c. and the use of digital payment services, we used information on the percentage of individuals who made/received digital payments in the past 12 months from the day of the survey. The variable *made digital payments* shows the percentage of respondents who report using mobile money, debit or credit card, or a mobile phone to make a payment from an account or report using the Internet to pay bills or to buy something online, in the past 12 months from the day of the survey. It also includes respondents who report paying bills or sending remittances directly from a financial institution account or through a mobile money account. The variable *received digital payments* shows the percentage of respondents who report using mobile money, debit or credit card, or a mobile phone to receive payment through an account in the past 12 months from the day of the survey. It also includes respondents who reported receiving remittances, receiving payments for agricultural products, receiving government transfers, receiving wages, or receiving a public sector pension directly into a financial institution account or through a mobile money account. We expect these variables to be positively correlated to the level of country GNI p.c.

Following the literature review, our basic assumption is that the use of digital services to a certain extent depends on the development of a particular country i.e., income, the availability of the Internet, as well as on the information and acceptance of digital technologies by the population. Therefore, if the population is poor and cannot satisfy even the existential needs, has a low level of education, insufficiently informed, incompatible with new technologies, we can expect that they will not be users of modern devices and digital services. Consequently, it can be assumed that the development of the country encourages the use of digital technologies to some extent.

In this paper, we used the World Bank classification for income groups i.e., low, lower-middle, upper-middle, and high-income. The classification is determined using thresholds based on the amount of gross national income per capita in US dollars, whereby every first July of the year, the classification is updated because the GNI p.c. is influenced by changes in income growth, inflation, exchange rates and population changes. Countries that belong to the category of high income are observed as developed countries, while middle- and low-income countries are observed as developing countries (Nielsen, 2011). A

more detailed insight into the classification of the World Bank and the codes used in this paper can be found in Table 1.

Table 1: Classification of countries by income group

Income level	GNI per capita (USD)	The codes of the income group
Low income	≤ 1,005	1
Lower-middle income	1,006 - 3,955	2
Upper-middle income	3,956 - 12,235	3
High income	≥ 12,236	4

Source: World Bank, available on https://blogs.worldbank.org/opendata/new-country-classifications-income-level-2017-2018 (31/12/2020)

The largest number of countries (30.49%) belong to the category high-income, followed by the category lower-middle income (26.95%). Upper-middle income countries constitute 26.24% of the sample, while the share of countries belonging to the category low-income countries amounts to 16.31% (Table 2). The low share of low-income countries in the sample of 141 countries can be explained by the fact that there are no available data for some countries characterized by a lower level of economic development. As expected, the average percentage of those who made digital payments is the highest in group 4, while it is the lowest in the first group.

Table 2: Descriptive statistics - Percentage of residents who made digital payments

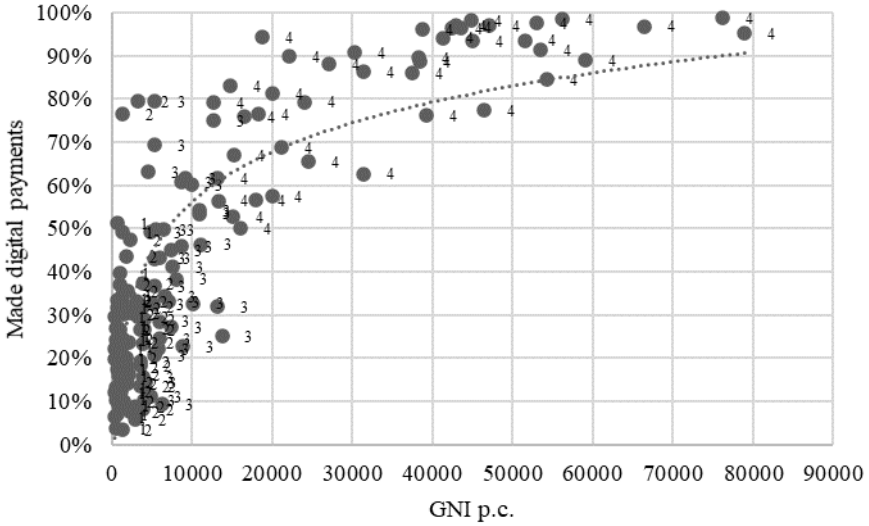
Income group	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min	Max
					Lower Bound	Upper Bound		
1	23	23.17%	13.03%	2.72%	17.54%	28.81%	3.76%	51.27%
2	38	26.16%	16.42%	2.66%	20.76%	31.56%	3.56%	79.39%
3	37	39.51%	18.40%	3.02%	33.38%	45.65%	9.27%	79.39%
4	43	82.67%	14.56%	2.22%	78.19%	87.15%	50.02%	98.88%
Total	141	46.41%	29.41%	2.48%	41.51%	51.31%	3.56%	98.88%

Source: the authors' calculation

Observing borderline countries in respective income groups, the lowest percentage of individuals who made digital payments reside in Afghanistan (group 1), Myanmar (group 2), Turkmenistan (group 3), and Trinidad and Tobago (group 4). The highest percentage of individuals who made digital payments live in Uganda (1), Mongolia (2), Iran (3), and Norway (4). In Serbia, 49.79% of individuals made digital payments in the past year i.e., in the past 12 months from the day of the survey (data collection in Serbia started on May 15, 2017, and end on June 27, 2017). The percentage of those who made digital payments in Serbia is above the average of the income group to which Serbia belongs i.e., upper-middle income group. Analysis of the relationship between GNI p.c. and the percentage of residents who made digital payments shows that a higher level of GNI p.c. corresponds to a higher percentage of residents who made digital payments. Although Figure 1 shows the relationship between income and making digital payments, other

factors, such as the level of financial literacy, type of financial system, the level of technological capabilities, infrastructure, education, etc., may influence the use of these digital services. Dots in Figure 1 represent pairs of GNI p.c. and the level of making digital payments with the corresponding number of income group next to the dot.

Figure1: Scatter plot for the percentage of residents who made digital payments and GNI p.c. (US$)



Source: the Global Findex Database and World Bank

Observing borderline countries in respective income groups, the lowest percentage of individuals who received digital payments reside in the Central African Republic (1), Myanmar (2), Iraq (3), and Saudi Arabia (4). The highest percentage of residents who received digital payments live in Uganda (1), Mongolia (2), Belarus (3), and Norway (4). In Serbia, 57.05% of individuals received digital payments in the past year i.e., in the past 12 months from the day of the survey. The percentage of those who received digital payments in Serbia is 18.46 percentage points higher than the average of the income group to which Serbia belongs i.e., upper-middle income group. As in the case of a percentage of residents who made digital payments, the highest percentage of those who received digital payments belong to the richest countries. The presented statistic shows that in all income groups, on average, there is a higher percentage of digital payments made compared to digital payments received. We also noticed that the spread between the richest and poorest countries is higher in making digital payments.

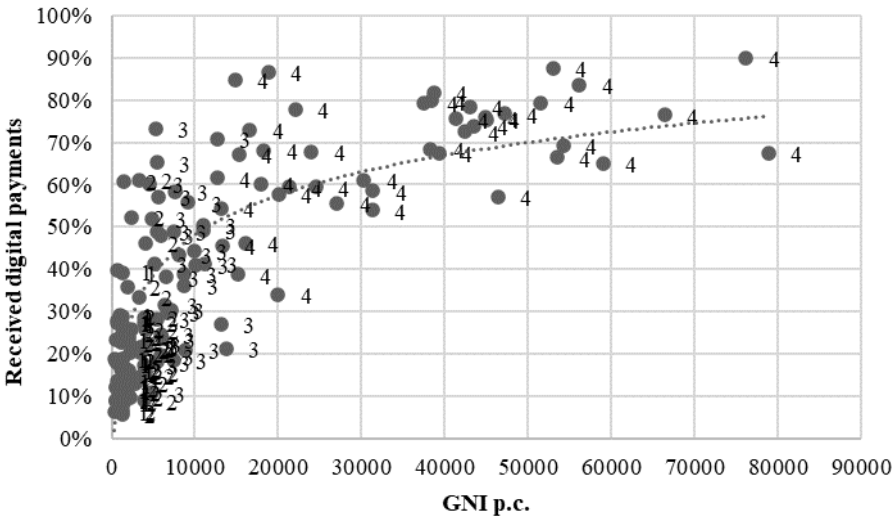
Table 3: Descriptive statistics - Percentage of residents who received digital payments

Income group	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min	Max
					Lower Bound	Upper Bound		
1	23	18.42%	9.47%	1.97%	14.32%	22.52%	6.23%	39.67%
2	38	23.22%	13.35%	2.16%	18.83%	27.61%	5.66%	61.16%
3	37	38.59%	16.41%	2.70%	33.11%	44.06%	10.72%	73.36%
4	43	67.86%	12.98%	1.98%	63.86%	71.86%	33.97%	89.86%
Total	141	40.08%	23.94%	2.02%	36.10%	44.07%	5.66%	89.86%

Source: the authors' calculation

Analysing the relationship between GNI p.c. and the percentage of residents who received digital payments, we can conclude that a higher level of income corresponds to a higher percentage of residents who received payments (Figure 2). Dots in the Figure represent pairs of GNI p.c. and the level of receiving digital payments with the corresponding number of income group next to the dot.

Figure 2: Scatter plot for a percentage of residents who received digital payments in the past year and GNI p.c. (US$)



Source: The Global Findex Database and World Bank

To confirm that there is a statistically significant correlation between the GNI p.c. and the use of digital payment service, we conducted a correlation analysis based on the Pearson coefficients. We found a statistically significant ($p < 0.01$) strong positive linear relationship between the GNI p.c. and making and receiving digital payments with values 0.810 and 0.759, respectively. Hence, we reject the null hypothesis that there is no linear

relationship between a country's income and the level of making and receiving digital payments. Parallel to this, we noticed an even stronger linear relationship between the making and receiving digital payments with a value of 0.951. We interpret this as a causal link because most individuals who adopt digital technologies simultaneously make and receive payments. Furthermore, the increased availability of financial instruments such as payment cards (debit or credit) enables making and receiving digital payments and provides a convenient way to conduct them.

Table 4. Pearson correlation coefficients for the whole sample

	Total sample		
	Received	GNI	Made
Received	1	0.759**	0.951**
Sig. (2-tailed)	0	0	0
GNI	0.759**	1	0.810**
Sig. (2-tailed)		0	0
Made	0.951**	0.810**	1
Sig. (2-tailed)	0		0
N	141	141	141

** - *Correlation is significant at the 0.01 level (2-tailed)*

Source: the authors' calculation

Generally, study results indicate that the use of digital financial services, i.e., making and receiving digital payments, is to some extent determined by the country's income. Results may be due to many factors. One of the barriers to using and accessing digital financial services is the lack of bank accounts, which is particularly evident in less developed countries. One of the most common reasons for not having a bank account is the lack of money (Global Partnership for Financial Inclusion, 2020), which indicates the importance of the country's development in terms of income. To overcome this problem, governments must take appropriate measures to enhance financial inclusion in the form of sending social funds to vulnerable groups through digital services.

The obtained results are in line with previous studies and research that showed that developing countries lag in terms of widespread technological diffusion (Comin & Mestieri, 2018), i.e., that developing countries have a longer lag in the adoption of innovations compared to developed countries (Bara, 2016). Also, the research is in line with a study by Abdinoor & Mbamba (2017) and Bryson & Atwal (2013), who stated that there are differences in the acceptance of e-banking and m-banking services by citizens according to the country's development. Also, Kolodinski et al. (2004, p. 250) confirmed that those with higher income are more likely to adopt e-banking technologies as well as Sulaiman et al. (2007, p. 163) who found that the level of income is significantly related to the adoption of m-banking.

Conclusion

The financial services industry has been changing rapidly in recent decades due to the digitalization of services and modernization and advances in technology, as well as to the

changing needs of customers in accessing financial services. The financial sector is exposed to constant changes; therefore, a quick and timely response following the client's requirements is needed. Bank clients need faster, more efficient, and convenient ways of delivering services and conducting transactions. As mobile devices have become an indispensable part of most people's daily lives, the traditional way of conducting transactions has been supplemented by a new, digital approach. Making payments that previously involved a physical visit to the bank, post office or other payment service providers is now replaced by digital service.

Previous studies have shown that income, i.e., development, plays an important role in widespread technological diffusion, i.e., the adoption of innovation, where an increase in per capita income can be considered as one of the crucial drivers of digital payments. Findings of certain studies indicate that income is related to the adoption of both e-banking and m-banking. In addition, an inevitable condition for the use of DFS is having a bank account.

In this paper, we provided the empirical analysis on the question of the relationship between the level of GNI p.c. and the use of digital payment services. Given the importance of these issues, especially related to the improvement of financial inclusion, we analysed data from 141 countries from the Global Findex database and World Bank database.

In conclusion, we found a strong statistically significant positive correlation between the country's income measured by GNI p.c. and the use of digital payment services, measured by the percentage of individuals that made and received digital payments. The results of our analysis are consistent with previous research and confirmed that income plays an important role in the use of DFS. Additionally, we noticed a strong statistically significant positive linear relationship between the making and receiving digital payments, concluding that the adoption of digital technologies is the most important process in increasing the level of the use of digital payment services.

Although this study contributes to the literature on financial inclusion, several limitations exist. We interpret the results of correlation only as an association, as it is a measure of the extent to which two variables are related, rather than examining causal relationships including other explanatory variables of the use of digital financial payments. Future research should include additional variables, such as ICT adoption, financial literacy and digital skills, macroeconomic and financial system stability, and other similar variables.

References

Aad, E., & Young, S. (2020). Cashing Out: Economic Growth through Payment Digitisation. White paper. Mastercard. Retrieved July 30, 2021 from https://newsroom.mastercard.com/mea/files/2020/05/Mastercard-White-Paper-Cashing-Out-Economic-Growth-through-Payment-Digitisation1.pdf

Abdinoor, A., & Mbamba, U. O. (2017). Factors influencing consumers' adoption of mobile financial services in Tanzania. *Cogent Business & Management*, *4*(1), 1-19. Doi:

https://doi.org/10.1080/23311975.2017.1392273

Agur, I., Martinez Peria, S., & Rochon, C. (2020). *Digital Financial Services and the Pandemic: Opportunities and Risks for Emerging and Developing Economies.* IMF Research.

Alliance for Affordable Internet. (2016). Affordability report 2015/16. Retrieved August 01, 2021 from https://www.itu.int/en/Lists/consultationOct2016/Attachments/44//Combined%202015-Affordability-Report+Womens%20Rights%20Online%202015%20report.pdf

Alliance for Financial Inclusion (2016). Digital financial services basic terminology. Guideline Note No. 19. Retrieved August 01, 2021 from https://www.afi-global.org/sites/default/files/publications/2016-08/Guideline%20Note-19%20DFS-Terminology.pdf

Antonijević, M., Ivanović, Đ., & Simović, V. (2021). Adoption of mobile banking in the Republic of Serbia. In: *Finance, Innovation and Technology: New Models and Structures*. Institute of Economics - Ss. Cyril & Methodius University, Skopje, pp. 76-95.

Aryamov, A., Grachova, V., Chuchaev, I., & Malikov, V. (2019). Digital asset as an object legal regulation. Ekonomika, 65(2), 1-11. Doi: https://doi.org/10.5937/ekonomika1902001A

Baliamoune-Lutz, M. (2003). An analysis of the determinants and effects of ICT diffusion in developing countries. *Information Technology for development*, *10*(3), 151-169. Doi: https://doi.org/10.1002/itdj.1590100303

Bank for International Settlement – BIS. (n.d.) Payments go (even more) digital. Retrieved January 10, 2021 from https://www.bis.org/statistics/payment_stats/commentary2011.htm

Bara, A. (2016). Diffusion and adoption of bank financial innovation in Zimbabwe: An external factor analysis. *African Journal of Science, Technology, Innovation and Development*, *8*(4), 357-368. Doi: https://doi.org/10.1080/20421338.2016.1156839

Broadband Commission for Sustainable Development. (2018). 2025 Targets: "Connecting the Other Half". Retrieved July 30, 2021 from https://broadbandcommission.org/Documents/publications/wef2018.pdf

Bryson, D., & Atwal, G. (2013). Antecedents of attitude towards the adoption of internet banking in Senegal. *Journal of Innovation Economics*, *11*(1), 33-54. Doi: http://doi.org/10.3917/jie.011.0033

Coconut Software and WBR Insights. (2019). Retrieved August 01, 2021 from https://www.coconutsoftware.com/wp-content/uploads/2019/11/Banking-Consumer-Study-Relationship-Between-Bank-Branch-and-Customer.pdf

Comin, D., & Mestieri, M. (2018). If technology has arrived everywhere, why has income diverged?. *American Economic Journal: Macroeconomics*, *10*(3), 137-78. Doi: https://doi.org/10.1257/mac.20150175

Dahlman, C., Mealy, S., & Wermelinger, M. (2016). Harnessing the digital economy for developing countries. OECD Development Center, Working Paper No. 334. Doi: https://doi.org/10.1787/18151949

Demirgüç-Kunt, A., Klapper, L., Singer, D., Ansar, S., & Hess, J. (2018). *The Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution.* World Bank: Washington, DC.

Druhov, O., Druhova, V., & Pakhnenko, O. (2019). The influence of financial innovations on EU countries banking systems development. *Marketing and Management of Innovations*, *3*, 167-177. Doi: http://doi.org/10.21272/mmi.2019.3-13

Erste Group. (2019). Retreived August 01,2021 from https://www.erstegroup.com/en/news-media/news-views/2019/08/29/branches-digital-banking-2019

Filipović, J. (2019). Analysis of attitudes and intentions of consumers towards the use of Internet banking services. *Anali Ekonomskog fakulteta u Subotici*, (41), 17-35. Doi: https://doi.org/10.5937/AnEkSub1941017F

Global Partnership for Financial Inclusion (GPFI). (2020). Advancing women's digital financial inclusion. Report prepared for the G20 Global Partnership for Financial Inclusion by the Better Than Cash Alliance, Women's World Banking, and the World Bank Group. Retrieved July 15, 2021 from https://btca-production-site.s3.amazonaws.com/documents/482/english_attachments/_Advancing_Womens_Digital_Financial_Inclusion_G20_GPFI.pdf?1606113263

Herwadkar, S., Verma, R., & Bilantu, P. (2019). Drivers of digital payments: a cross country study. *RBI Bulletin* August 2019. Retrieved July 15, 2021 from https://rbidocs.rbi.org.in/rdocs/Bulletin/PDFs/1DRIVERSOFDIGITALPAYMENTS7A43A13DB4F44F27ADF55D22FDCAAABB.PDF

International Telecommunication Union – ITU (2017). ITU-T Focus Group Digital Financial Services Executive summary. Retrieved August 01, 2021 from https://www.itu.int/dms_pub/itu-t/opb/tut/T-TUT-DFS-2017-3-PDF-E.pdf

International Telecommunication Union – ITU (2018). Measuring the Information Society Report. Volume 1. Retrieved August 01, 2021 from https://www.itu.int/en/ITU-D/Statistics/Documents/publications/misr2018/MISR-2018-Vol-1-E.pdf

Jokić, S., Cvetković, A. S., Adamović, S., Ristić, N., & Spalević, P. (2019). Comparative analysis of cryptocurrency wallets vs traditional wallets. *Ekonomika, 65*(3), 65-75. Doi: https://doi.org/10.5937/ekonomika1903065J

Kambale, L. (2017). Digital financial services: a case of Malawi. Malawi Communication Regulatory Authority. Retrieved July 30, 2021 from https://www.itu.int/en/ITU-D/Capacity-Building/Documents/IG_workshop_August2018/Presentations/Session8_LindaKambale.pdf

Karjaluoto, H., Mattila, M., & Pento, T. (2002). Factors underlying attitude formation towards online banking in Finland. *International Journal of Bank Marketing*, *20*(6), 261-272. Doi: https://doi.org/10.1108/02652320210446724

Keskin, A. (2017). Income distribution and economic growth: a complementary cross-country study to the Kuznets curve. *Afyon Kocatepe University Journal of Social Sciences*, *19*(2), 235-250. Doi: https://doi.org/023106710054068

Klapper, L., & Singer, D. (2014). *The opportunities of digitizing payments: How digitization of payments, transfers, and remittances contributes to the G20 goals of broad-based economic growth, financial inclusion, and women's economic empowerment*. World Bank Development Research Group Report. Washington, DC.

Kolodinsky, J. M., Hogarth, J. M., & Hilgert, M. A. (2004). The adoption of electronic banking technologies by US consumers. *International Journal of Bank Marketing*, *22*(4), 238–259. Doi: https://doi.org/10.1108/02652320410542536

Kumar, B., & Mohanty, B. (2011). Financial inclusion and inclusive development in SAARC countries with special reference to India. *Vilakshan: The XIMB Journal of Management, 8*, 13–22.

Lee, E. J., Lee, J., & Schumann, D. W. (2002). The influence of communication source and mode on consumer adoption of technological innovations. *Journal of Consumer Affairs*, *36*(1), 1-27. Doi: https://doi.org/10.1111/j.1745-6606.2002.tb00418.x

Ljumović, I., & Pavlović, D. (2021). *Expanding financial inclusion for youth: Does digitalization matter?* In I. Ljumović, & I. Stancheva-Gigov (Eds), Finance, Innovation and Technology: New Models and Structures, (p. 23-43), Skopje: Ss. Cyril & Methodius University in Skopje, Institute of Economics.

Lukić, V., & Živković, A. (2017). *Izazovi bankarske delatnosti u digitalnom dobu – slučaj mobilnog bankarstva*. In S. Tuševljak & Č. Ocić (Eds), Proceedings Institucije i ekonomija – šta (ne)možemo uraditi bolje (p. 165 – 177). East Sarajevo: University of East Sarajevo.

Lyons, A., Kass-Hanna, J., & Polato e Fava, A. (2020). Fintech Development, Savings, Borrowing and Remittances: A Comparative Study of Emerging Economies, 1-39. Doi: http://dx.doi.org/10.2139/ssrn.3689142

Nielsen Global Survey, (2016). Mobile Money. Retrieved July 15, 2021 from: https://www.nielsen.com/wp-content/uploads/sites/3/2019/04/nielsen-global-mobile-money-report-oct-2016-1.pdf.

Nielsen, L. (2011). *IMF working paper–classifications of countries based on their level of development: how it is done and how it could be done*. International Monetary Fund.

Oz-Yalaman, G. (2019). Financial inclusion and tax revenue. *Central Bank Review*, *19*(3), 107-113. Doi: https://doi.org/10.1016/j.cbrev.2019.08.004

Pazarbasioglu, C., Garcia Mora, A., Uttamchandani, M., Natarajan, H., Feyen, E., & Saal, M. (2020). Digital financial services. World Bank Group. Retrieved August 01, 2021 from

http://pubdocs.worldbank.org/en/230281588169110691/Digital-Financial-Services.pdf

Spalević, Ž., Ilić, M., & Filipić, G. (2019). Pravni i ekonomski aspekti intelektualne svojine u cyber prostoru. *Ekonomika*, *65*(2), 51-64. Doi: https://doi.org/10.5937/ekonomika1902051S

Statista. (2021). Forecast number of mobile devices worldwide from 2020 to 2025 (in billions). Retrieved August 01, 2021 from https://www.statista.com/statistics/245501/multiple-mobile-device-ownership-worldwide

Statista. (2021). Number of smartphone users from 2016 to 2021. Retrieved August 01, 2021 from https://www.statista.com/statistics/330695/number-of-smartphone-users-worldwide/

Statista. (2021). Share of households with a computer at home worldwide from 2005 to 2019. Retrieved August 01, 2021 from https://www.statista.com/statistics/748551/worldwide-households-with-computer/

Sulaiman, A., Jaafar, N. I., & Mohezar, S. (2007). An overview of mobile banking adoption among the urban community. *International Journal of Mobile Communications*, *5*(2), 157-168. Doi: https://doi.org/10.1504/IJMC.2007.011814

World Bank. (n.d.) Individuals using the Internet (% of population). Retrieved August 01, 2021 from https://data.worldbank.org/indicator/IT.NET.USER.ZS

World Bank. (n.d.). Financial Inclusion. Retrieved January 10, 2021 from https://www.worldbank.org/en/topic/financialinclusion

World Bank. (n.d.). The Global Findex Database 2017. Retrieved December 24, 2020 from https://globalfindex.worldbank.org/

World Development Report (2016). Enabling digital development - Digital finance. Retrieved August 01, 2021, from http://documents1.worldbank.org/curated/en/896971468194972881/310436360_20160263021313/additional/102725-PUB-Replacement-PUBLIC.pdf

Worldometer. (n.d.). World Population Projections. Retrieved August 01, 2021 from https://www.worldometers.info/world-population/world-population-projections/

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Rural development of regions of the Republic of Serbia in terms of employment and sources of income

Рурални развој региона Републике Србије у погледу запослености и извора прихода

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Abstract: Integrated rural development enables linking agriculture with other economic activities whereby an adequate approach to regional development contributing to a more balanced development among regions. The aim of this research is to indicate that with the concept of integral rural development the differences between regions or rural and urban areas of Serbia could be reduced. Through the Kruskal-Wallis test for comparison of groups, the important differences were compared, where the results of research showed that they are very significant, especially between the Belgrade Region and the predominantly rural regions of Serbia. These differences can be overcome in rural areas if agriculture is more intensively linked with tertiary and secondary sectors.
Keywords: integrated rural development, regional development, rural and urban areas, regions, employed population and workers, income diversification
JEL classification: R11, R20, R50

Сажетак: Интегрални рурални развој омогућава повезивање пољопривреде са другим економским активностима, чиме адекватан приступ регионалном развоју доприноси уравнотеженијем развоју међу регионима. Циљ овог истраживања је да укаже на то да би се концептом интегралног руралног развоја могле смањити разлике између региона или руралних и урбаних подручја Републике Србије. Kruskal-Wallis тестом за упоређивање група упоређиване су важне разлике, где су резултати истраживања показали да су веома значајне, посебно између Београдског региона и претежно руралних региона Републике Србије. Ове разлике могу се превазићи у руралним подручјима ако је пољопривреда интензивније повезана са терцијарним и секундарним секторима.
Кључне речи: интегрални рурални развој, регионални развој, рурална и урбана подручја, региони, запослено становништво и радници, диверзификација дохотка
ЈЕЛ класификација: R11, R20, R50

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Introduction

Integrated rural development is a concept for a comprehensive approach to rural development (Leupolt, 1977). In addition to development of agriculture, it also implies development of other economic activities and non-economic sectors in rural areas. The diversification of rural economy is especially significant, through development of small and medium enterprises for processing agricultural products, as well as development of tourism in rural areas. It must be accompanied by development of rural infrastructure, public services, etc. Integral rural development offers a significant opportunity to reduce the enormous rural poverty. Heterogeneity of conditions under which the rural poor operate requires creativity in project implementation, and this has to be done locally through decentralization (De Janvry & Sadoulet, 2005).

Globalization has a pervasive influence across rural Europe. The uneven geographies of globalization include differences between urban and rural areas, but also different outcomes between different rural regions. Implementation of rural development programmes is contingent on structural constraints and the serendipity of local agency, such that the outcomes of globalization will continue to be different in different rural regions (Woods & McDonagh, 2011).

In the literature, it is often pointed out that the future of agrarian sector is strongly linked to the balanced development of rural areas. Accordingly, the EU reforms its agrarian policy into rural development policy by adopting the concept of integrated sustainable rural development, due to the need for a new approach to the development of economy and agriculture in rural areas. Harmonization with the EU rural development policy in the Republic of Serbia (EU candidate country) aims to enable more efficient connection of agriculture with other branches, in order to provide new jobs, more investment and exports from the Republic of Serbia. The Republic of Serbia has favourable natural conditions for agricultural and rural development, but the negative development trend is followed by deagrarianism and demographic emptying of villages. Because of that, new paradigm of sustainable agricultural and rural development, as well as new agricultural and rural policy is needed (Pejanović et al., 2017).

The subject of research in this paper are significant differences in the rural development of the regions of the Republic of Serbia. Accordingly, the aim of this research is to determine what are the most important differences in the development of rural areas of the Republic of Serbia, as well as what are the possibilities of overcoming the differences, through an integrated approach to rural development in the regions where such an approach can be applied. The example of Serbia could be useful for other countries with similar resources and limitations for development.

This paper assumes that the significant differences that exist between extremely rural regions and those that are not, that is, between income generated in rural and non-rural areas, could be largely overcome through the process of integrated rural development, i. e. integration agriculture with non-agricultural activities in rural areas.

1. Literature review

Rural areas are of particular importance for many countries around the world, with different definitions of these areas. One of the most accepted definition of rural areas is the OECD typology, which is based on population density and size criteria (OECD, 2011). Namely, OECD methodology identifies predominantly urban, significantly rural and predominantly rural regions. Thereby, areas with a population density of less than 150 inhabitants per km² have been classified as rural. According to the OECD methodology, rural areas occupy about 85% of the total territory of Serbia.

Rural development refers to the development of rural areas, where it is primarily focused on the development of agriculture and manufacturing SMEs, especially SMEs in food industry, then trade, tourism, crafts and infrastructure, and greater availability of public services. The process of rural development is primarily conditioned by internal factors (management of available resources; transfer of knowledge and appropriate technological solutions to the rural economy; volume of support for increasing the competitiveness of farmers and rural economy, etc.) as well as external factors such as climate change, global economic, financial and political factors, international integrations, etc. (Kvrgić & Ristić, 2018).

Rural development research is about the processes that determine the uneven geographic distribution of population, industry, and returns to nonfarm economic activities. Nominal incomes and rents decline dramatically with distance from urban centres. This emphasized the need to do more than identify rural labour market signals and trends (Kilkenny, 2010). In the contemporary conditions, the concept of sustainable rural development is becoming more and more relevant, which represents the integration of rural and sustainable development policy, with respecting the ecological, economic and social dimension of development.

Agriculture plays an important role in the concept of sustainable rural development, as traditionally the most represented activity of the rural economy (Ristić, 2013). Agriculture is not the major source of rural livelihoods, if still an important part of it. This is demonstrated by the current level and the consistently rising share of non-farm income in total household revenues throughout the developing world. Many households in contemporary rural areas comprise productive members who are either part-time farmers or non-agricultural income earners. State of different sector in contributions to sustainable rural development is reflected in agroecological multifunctionality and non-farm income diversification (Amekawa, 2011). The multifunctionality of agriculture is an important factor in the diversification of activities in rural areas, in terms of possible contribution to employment, etc. (Ploeg et al., 2000). Rural nonfarm employment (RNFE) is especially important for rural households in developing countries (Reardon et al., 2007).

Countryside will most probably not undergo radical shifts, but it can be proposed that this countryside will be more diversified, more socially and economically active, and

more attractive as the place of residence and of work. Even though agriculture will continue to fulfil an important economic function, the incomes of households will mainly originate from the activities in other sectors of economy (service, construction, energy), or from the businesses indirectly associated with agricultural production (food processing, agritourism, protection of nature and of cultural heritage). These processes imply an increase in entrepreneurship of rural inhabitants. One particularly vital role in the development of the rural areas will be played by the small entities functioning in the spheres of service and food production (Bański, 2018).

Specific forms of horizontal integration in the agricultural sector have become more important, so cooperative groups of agricultural producers as their form play an important role in the socio-economic development of agriculture and rural areas, both in more and less economically developed countries. Thereby, agricultural cooperatives have a significant role in the overall economic and social development by creating jobs, generating income to their members and reducing poverty in rural areas (Pawlak et al., 2019).

There are different levels of analysis of rural development, such as farms, households, local communities, regions, national or global economies (Knickel & Renting, 2000). Regionalization is important for the implementation of the rural development concept in order to overcome territorial differences of development and to achieve more balanced regional development (Rikalović et al., 2017). Thus, rural development policy must be coherent with regional development policy. It must be pointed out that the public sector – mainly the local government – tends to be the main facilitator of local cooperation in all fields. In underdeveloped rural regions, the local government is also the main actor of regional and rural development (Perger, 2016).

Table 1: Population per 1 km², by regions of the Republic of Serbia[*]

	2010	2011	2012	2013	2014	2015	2016	2017
Belgrade Region	512	514	515	516	518	519	521	522
Vojvodina Region	91	90	89	88	88	88	87	87
Šumadija and Western Serbia Region	77	76	76	76	75	74	74	73
Southern and Eastern Serbia Region	63	63	61	60	60	59	59	58

Source: Statistical Office of the Republic of Serbia, Municipalities and Regions in the Republic of Serbia, for the observed years.

** Data for Kosovo and Metohija region are not available.*

Rural development policy reforms and necessary institutional adjustments are of particular importance in overcoming the transitional challenges for the Western Balkan countries, whose economies are highly dependent on agriculture (Martinovska Stojcheska et al., 2016). Observing the regions of the Republic of Serbia (one of the Western Balkan countries) according to the population density criterion below 150 inhabitants per km² (Table 1), all regions except the Belgrade Region, could be considered as extremely rural.

Thereby, the most important and often the only activity in countryside is agriculture. Therefore, regional and rural development policies are of particular importance to Serbia.

Serbia has a long tradition in dealing with the problems of regional development, but the policies related to the rural areas and irregularities of territorial development have not been sufficiently coherent. The place and role of rural development in balanced regional development have long been unjustly neglected. The economic development of rural areas should be based on the model of multifunctional agriculture and the introduction of additional activities, which will be the solution of employment outside agriculture in rural areas. Alternatives of employment in agriculture can be seen in activities connected to the agricultural production (food-processing industry, forest products and medicinal herbs, healthy food, etc.), tourism (rural, ecotourism, hunting, fishing, etc.), recreation, handicrafts, handwork, trade, culture, other service activities and similar. Apart from the decentralization and the adequate territorial organization of state on regions, it is necessary, to especially draw attention to detailed solving of the question of Serbian village and elimination of traditionally established dichotomy between village-town (Todorović et al., 2010).

Some factors can be generalized as having a key role in the increase in the scale of rural–urban linkages. Decreasing incomes from farming means that increasing numbers of rural residents engage in nonfarm activities that are often located in urban centres. The main reasons for the failure of many policies that try to use rural-urban links to promote regional development are that they were largely based on assumptions that did not necessarily reflect the real circumstances of certain locations and the people who live and work there. This requires a decentralized approach managed by local requirements, i.e. policies that support the positive aspects of rural-urban connections (Tacoli, 2013).

The world is in dire need of a new rural–urban compact, one that keeps delivering the food and fibres that the world needs, but at the same time is able to (Gutman, 2007): (a) improve jobs and income opportunities of rural population; (b) reduce rural – urban divide; (c) reverse the current trend of environmental degradation that is jeopardizing both people and nature.

2. Methodology and data

This paper analyses statistically significant differences between different groups of examined variables, using appropriate statistical tests. On the basis of territorial approach, what can be observed is a difference between the regions of Serbia according to the employment and unemployment, then share of imports and exports of regions in total imports and exports of the Serbia, as well as coverage of imports by exports, the share of regions in GDP, the investments in fixed assets for agriculture and total fixed capital formation, and the rate of absolute poverty. The secondary data for this survey are taken from the Statistical Office of the Republic of Serbia (Labour Force Survey, Foreign Trade in Goods, Statistical Yearbooks and Annual National Accounts, for the observed years) and

from the Social Inclusion and Poverty Reduction Unit of the Government of the Republic of Serbia, 2018. Since integrated rural development and balanced regional development require adequate linking of agriculture with other economic activities, this paper analyses employment by regions, in the primary, secondary and tertiary sectors, i. e. linking agriculture with other economic activities. In terms of employment by regions, diversification of revenue generated in rural and urban areas has been observed. For these analyses, secondary data were also taken from the Statistical Office of the Republic of Serbia (Labour Force Survey and Household Budget Survey, for the observed years).

The analysis was conducted by examining differences between those regions, by territorial approach, for which the Kruskal-Wallis test was used. The Kruskal-Wallis test was used to first determine differences in employment between sectors within each region, and then to compare sectoral employment between regions. Also, it was the most suitable test to determine the sources of income that dominate within all rural areas of the regions of Serbia, as well as to compare those incomes between those rural areas of the region, to determine which incomes and in which areas are more dominant. The same comparison was made for the urban areas of Serbia in order to compare which incomes dominate in the rural areas of the region in relation to the urban ones.

3. Empirical analysis and results

This survey used the NUTS 2 classification for the Republic of Serbia, 2010, excluding Kosovo and Metohija, due to unavailability of data.

Table 2: Significant economic indicators of differences between regions of the Republic of Serbia, 2010-2017

	Employment rate	Unemployment rate	Exports (share in total)	Imports (share in total)	Coverage of imports by exports	Investments in fixed assets	Investments in fixed assets	Absolute poverty rate	GDP (% share)
Chi Square	9.69	3.39	24.98	29.09	25.64	28.91	18.36	25.98	29.11
AsumpSig.	.021**	.335	.000*	.000*	.000*	.000*	.000*	.000*	.000*
				Mean Rank					
Belgrade Region	21.13	12.31	16.25	28.50	4.50	28.50	10.06	4.63	28.5
Vojvodina Region	12.06	17.56	28.19	20.50	12.75	20.38	28.50	16.00	20.5
Šumadija and Western Serbia Region	22.13	15.44	16.81	12.50	24.50	12.63	13.00	16.88	12.5
Southern and Eastern Serbia Region	10.69	20.69	4.75	4.50	24.25	4.50	14.44	28.50	4.5

Note: The value is significant at 1% (*), 5% (*), and 10% (***) confidence level.
Source: the authors' research, based on data of the Statistical Office of the Republic of Serbia, for the observed years.

Based on Table 2, it is evident that Vojvodina has the highest share in exports, while the Belgrade Region in imports. On the other hand, Southern and Eastern Serbia participates the least in both imports and exports (p =.000), but it is second by the coverage of imports by exports, behind Šumadija and Western Serbia, while the Belgrade Region has the lowest coverage (p =.000). In terms of investments in fixed assets, the Belgrade Region is the leader in comparison with others, while Southern and Eastern Serbia is in last place (p =. 000). It is in second place in terms of investments in fixed assets in agriculture, after the Region of Vojvodina, and the Belgrade Region is in last place (p =.000). The poorest is Southern and Eastern Serbia, then Šumadija and Western Serbia, Region of Vojvodina and finally the Belgrade Region (p =.000), which means that the rural regions are poorer. By share in the structure of GDP, the order is reverse (p =.000), i. e. rural areas have lower GDP per capita than urban areas, which is an indicator of their lagging behind in economic development. The economic structure of rural areas is highly dependent on the primary sector, especially on agriculture, indicating a low diversification of income and population activities in these areas.

Based on the conducted analysis, it can be concluded that there is a statistically significant difference between the employment rate of the regions (p =.021) and that the highest employment rate is in Šumadija and Western Serbia, followed by the Belgrade Region, Vojvodina and finally the Southern and Eastern Serbia region (Table 2). The unemployment rate is the lowest in the Belgrade Region and the highest in the Southern and Eastern Serbia region. These differences are not statistically significant, so the focus is on employment by region, both in agriculture and in other economic sectors. It also examines the revenue generated on this basis, both in rural and urban areas, within the observed regions.

Employed population, in addition to persons who work in an enterprise or organization, includes individual farmers, assisting household members, as well as persons who do some work independently. According to the Labour Law, employed workers are individuals employed by their employers. Table 3 shows that the most employed population is in the tertiary, secondary and finally in the primary sector, in all regions except Šumadija and Western Serbia (p =.000) where the population is, after the tertiary sector, the most employed in the primary sector, so it opens the space for greater integration of agriculture with other economic activities, and for new jobs. Table 4 (shown in the Appendix) concludes that the most employed population in the primary sector are in Šumadija and Western Serbia, followed by Southern and Eastern Serbia, the Region of Vojvodina and finally the Belgrade Region (p =.000). In the secondary sector, the most population is employed in Vojvodina, then in Southern and Eastern Serbia, Šumadija and Western Serbia, while Belgrade Region is again at the back (p =.000), but in the first if tertiary sector is analysed, followed by Vojvodina, Southern and Eastern Serbia and finally Šumadija and Western Serbia (p =.000).

Table 3: Employed population and workers, by regions and sectors of the Republic of Serbia, 2010-2017

		Belgrade Region	Vojvodina Region	Šumadija and Western Serbia	Southern and Eastern Serbia
Employed population	Chi-Square	20.480	20.489	15.585	20.489
	Asump Sig.	.000*	.000*	.000*	.000*
Employed workers	Chi-Square	20.498	20.489	20.489	20.480
	Asump Sig.	.000*	.000*	.000*	.000*
Business sectors		Mean Rank			
Employed population	Primary	4.50	4.50	9.31	4.50
	Secondary	12.50	12.50	7.69	12.50
	Tertiary	20.50	20.50	20.50	20.50
Employed workers	Primary	4.50	4.50	4.50	4.50
	Secondary	12.50	12.50	12.50	12.50
	Tertiary	20.50	20.50	20.50	20.50

Note: The value is significant at 1% (*), 5% (*), and 10% (***) confidence level.
Source: the authors' research, based on data of the Statistical Office of the Republic of Serbia, for the observed years

The most employed workers in the primary sector are in Vojvodina, Southern and Eastern Serbia, Šumadija and Western Serbia and finally in the Belgrade Region (Table 4). The highest number of registered workers working under the Employment Contract in primary sector is in Vojvodina, and the least in Šumadija and Western Serbia because this region is leading by employed population, but it is in third place by the number of employed workers in this sector. A similar situation is with the secondary sector, where the highest number of employees is in Šumadija and Western Serbia, then in Southern and Eastern Serbia, Vojvodina and finally in the Belgrade Region. Employed workers in the tertiary sector have the same structure as the employed population in terms of the regions with the highest and least employment of workers (p =.000).

Table 4: Significant differences between the regions of the Republic of Serbia in terms of employed population and workers in the primary, secondary and tertiary sectors, 2010-2017

	Employed population			Employed workers		
	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary
Chi-Square	27.429	22.984	22.253	26.555	28.107	21.213
Asump Sig.	.000*	.000*	.000*	.000*	.000*	.000*
	Mean Rank					
Belgrade Region	4.50	4.50	28.50	4.50	4.50	28.50
Vojvodina Region	13.69	26.00	18.50	28.50	12.50	12.19
Šumadija and Western Serbia Region	28.38	15.00	4.88	15.13	27.75	8.13

Region of Southern and Eastern Serbia	19.44	20.50	14.13	17.88	21.25	17.19

Note: The value is significant at 1% (*), 5% (*), and 10% (***) confidence level
Source: Authors' research, based on data of the Statistical Office of the Republic of Serbia, for the observed years.

Table 5 shows that regular salaries and pensions are dominant in rural areas of all regions. In the Belgrade Region, after the above, the highest share in income have other receipts and natural consumption (p =. 000). In the Region of Vojvodina the highest share in the income, after the regular salaries and pensions, is taken up by income from agriculture, hunting and fishing and natural consumption. The situation is similar in Šumadija and Western Serbia and Southern and Eastern Serbia (p =.000), where natural consumption and income from agriculture, hunting and fishing are among the highest share of income.

Table 5: Sources of income in rural areas, by regions of the Republic of Serbia, 2011-2017

	Belgrade region	Region of Vojvodina	Region of Šumadija and Western Serbia	Region of Southern and Eastern Serbia
Chi-Square	71.812	76.282	77.191	74.265
Asump Sig.	.000*	.000*	.000*	.000*
		Mean Rank		
Regular salaries and wages	77.00	77.00	77.00	70.36
Other income	39.36	48.36	35.71	35.57
Pensions	70.00	69.86	70.00	76.64
Other social insurance receipts	43.64	41.14	41.21	38.00
Income from agriculture, hunting and fishing	32.21	63.14	57.86	51.86
External receipts	13.14	27.71	25.79	32.79
Real estate related income	16.79	19.64	8.36	13.21
Donations and awards	30.00	12.36	20.21	15.14
Customer and investment credits	44.83	23.83	22.67	21.50
Other receipts	61.21	33.86	48.93	51.14
Earned receipts in kind	5.86	4.00	6.93	6.36
Natural consumption	54.43	55.57	61.14	62.57

Note: The value is significant at 1% (*), 5% (*), and 10% (***) confidence level.
Source: the authors' research, based on data of the Statistical Office of the Republic of Serbia, for the observed years.

Although agriculture is the dominant economic activity in rural areas of the Republic of Serbia, the share of agriculture in rural households` income is not dominant (Zekić et al., 2016, p. 172). In doing so, rural poverty is closely linked to the high

dependency of the rural economy on agriculture. With this in mind, to stop the negative trends in rural areas, a more adequate rural development policy is needed, with the application of the concept of integrated rural development, as well as greater financial and overall institutional support for rural economy.

When looking at the rural population (Table 6), it is observed that the regular salaries and wages are the highest in the Belgrade Region, then Vojvodina, Šumadija and Western Serbia and finally in Southern and Eastern Serbia (p =.000), while other income are the highest in Region of Vojvodina and the lowest in Šumadija and Western Serbia. The pensions have the highest importance in Southern and Eastern Serbia, and the lowest in the Region of Vojvodina (p =.000). The incomes from agriculture, hunting and fishing are the highest in the Region of Vojvodina (real estate related incomes are also high in Vojvodina), then in Šumadija and Western Serbia, Region of Southern and Eastern Serbia and finally in the Belgrade Region (p =.000). External receipts dominate in Southern and Eastern Serbia, donations and awards in the Belgrade Region, and other receipts in the Southern and Eastern Serbia region. Natural consumption is the highest in Šumadija and Western Serbia, and the lowest in the Belgrade Region. In terms of individual consumption of household - food and non-alcoholic beverages, although it dominates in all regions over other consumption categories it is not statistically significant between regions.

Table 6: Regional differences in rural areas of the Republic of Serbia in terms of sources of income and individual consumption of household, 2011-2017

	Chi-Square	Asump Sig.	Mean Rank	
				Belgrade region
Regular salaries and wages	20.294	.000*		24.71
Other income	14.144	.003*		11.50
Pensions	19.147	.000*		19.36
Other social insurance receipts	3.219	.359		14.21
Income from agriculture, hunting and fishing	20.495	.000*		4.00
External receipts	21.282	.000*		4.43
Real estate related income	12.917	.005*		15.79
Donations and awards	15.882	.001*		24.64
Customer and investment credits	4.747	.191		9.83
Other receipts	15.140	.002*		19.07
Earned receipts in kind	3.641	.303		10.64
Natural consumption	22.810	.000*		4.50
Individual consumption of household - food and non-alcoholic beverages	4.272	.234		11.79

Vojvodina Region	16.00	23.71	6.14	18.64	22.29	20.14	22.86	13.29	7.33	4.36	18.21	10.50	11.50
Šumadija and Western Serbia Region	11.86	8.00	9.71	10.79	19.29	11.14	7.93	12.99	4.33	15.43	14.07	23.29	15.29
Southern and Eastern Serbia Region	5.43	14.79	22.79	14.36	12.43	22.29	11.43	8.07	4.50	19.14	15.07	19.71	19.43

Note: The value is significant at 1% (*), 5% (*), and 10% (***) confidence level.
Source: the authors' research, based on data of the Statistical Office of the Republic of Serbia, for the observed year

Observing the urban areas of analysed regions (Table 7), it is noted that regular salaries and wages and pensions dominate. In the Belgrade Region other income and other receipts also have a significant share, while in Vojvodina, in addition to other incomes and social insurance receipts, income from agriculture, hunting and fishing are also significant. In urban areas in Šumadija and Western Serbia incomes from agriculture, hunting and fishing are among the smallest, as well as in Southern and Eastern Serbia (p =.000). Otherwise, in the urban areas of the regions of Serbia income from agriculture, hunting and fishing has the highest importance in Vojvodina, although they are less important than in rural areas.

Table 7: Sources of income in urban areas, by regions of the Republic of Serbia, 2011-2017

	Belgrade Region	Vojvodina Region	Šumadija and Western Serbia Region	Southern and Eastern Serbia Region
Chi-Square	73.185	68.740	70.678	74.491
Asump Sig.	.000*	.000*	.000*	.000*
		Mean Rank		
Regular salaries and wages	77.00	77.00	77.00	77.00
Other income	59.00	58.79	45.86	53.36
Pensions	70.00	70.00	70.00	70.00
Social insurance receipts	48.50	51.57	56.57	53.71
Income from agriculture, hunting and fishing	8.14	49.43	32.21	12.71

External receipts	31.71	32.64	32.71	40.86
Real estate related income	28.14	19.86	12.79	19.21
Donations and awards	44.47	15.64	28.93	28.93
Customer and investment credits	39.83	41.83	48.67	24.00
Other receipts	53.43	34.93	57.71	60.43
Earned receipts in kind	10.71	4.00	4.00	5.43
Natural consumption	14.57	31.07	24.21	30.93

Note: The value is significant at 1% (*), 5% (*), and 10% (***) confidence level.
Source: the authors' research, based on data of the Statistical Office of the Republic of Serbia, for the observed years.

Revenues that are statistically significant and that differ by regions in urban areas (Table 8) are other receipts. They are the highest in Southern and Eastern Serbia and the smallest in the Region of Vojvodina. Income from agriculture, hunting and fishing are the highest in Vojvodina, followed by Šumadija and Western Serbia, Southern and Eastern Serbia, and finally the Belgrade Region. External receipts are the highest in Vojvodina and the lowest in the Belgrade Region. Also, Vojvodina is dominated by real estate related income over other regions, while donations and awards are the most significant for the Belgrade Region. Customer and investment credits are highest in Šumadija and Western Serbia, other receipts in Southern and Eastern Serbia, while natural consumption is highest in Vojvodina and the lowest in the Belgrade Region. In terms of individual consumption of household, urban and rural areas are dominated by food and non-alcoholic beverages, with no statistically significant difference between regions. Income from agriculture, hunting and fishing have the largest share in Vojvodina, then in Šumadija and Western Serbia, Southern and Eastern Serbia, and the least importance is in the Belgrade Region.

Table 8: Regional differences in urban areas of the Republic of Serbia in terms of sources of income and individual consumption of household, 2011-2017

	Regular salaries and wages	Other income	Pensions	Other social insurance receipts	Income from agriculture, hunting and fishing	External receipts	Real estate related income	Donations and awards	Customer and investment credits	Other receipts	Earned receipts in kind	Natural consumption	Individual consumption of household - food and non-alcoholic beverages
Chi-Square	4.243	15.306	1.500	4.671	20.535	13.182	5.285	9.413	7.230	16.719	6.038	21.639	2.380
Asump Sig.	.236	.002*	.682	.198	.000*	.004*	.152	.024**	.065***	.001*	.110	.000*	.497
Mean Rank													

Belgrade region	19.29		14.07	11.79	8.86	5.86		6.57	16.00	22.07	6.33		13.21	18.43	4.00	12.57
Region of Vojvodina	10.64		21.64	16.36	15.50	24.07		20.07	19.29	9.21	8.67		5.36	17.43	23.93	14.21
Šumadija and Western Serbia Region	15.21		5.07	16.21	16.00	17.86		11.86	9.71	14.00	9.00		16.43	11.07	13.14	12.71
Southern and Eastern Serbia Region	12.86		17.21	13.64	17.64	10.21		19.50	13.00	12.71	2.00		23.00	11.07	16.93	18.50

Note: The value is significant at 1% (*), 5% (*), and 10% (***) confidence level.
Source: Authors' research, based on data of the Statistical Office of the Republic of Serbia, for the observed years.

Natural consumption, as an essential component of rural income, which is not the case in urban areas, also differs between the regions. In rural areas it is most significant for the Šumadija and Western Serbia, then Southern and Eastern Serbia, Vojvodina and finally the Belgrade Region (Table 6). In urban areas it is of greatest importance for the Region of Vojvodina and Southern and Eastern Serbia, while it is less important for Šumadija and Western Serbia and the Belgrade Region (Table 8).

Conclusion

It is observed that unemployment in the Belgrade Region, as well as the absolute poverty rate in this region, are lower than in the extremely rural regions (Vojvodina, Šumadija and Western Serbia, Southern and Eastern Serbia). Thereby, the Belgrade Region has the lowest export-import ratio, but its share in GDP is the highest. It also has the smallest investment in agriculture, but the highest total investment in fixed assets. In all observed regions of the Republic of Serbia, the highest employment is in the tertiary sector. In rural areas, employment in the primary sector as well as in the secondary sector is very important, while employment in the tertiary sector is of particular importance in the Belgrade Region. The above points to the conclusion that all rural areas should focus more on linking the primary sector with the tertiary, but also with the secondary, through the development of non-agricultural activities, primarily rural tourism, industrial processing of primary agricultural products, etc.

Although higher employment in the primary sector is in rural than in non-rural regions of the Republic of Serbia, and since higher incomes from agriculture are generated in rural regions, particularly in Vojvodina. These incomes are in all regions of the Republic of Serbia behind regular salaries and wages, which are the highest in the Belgrade Region, as well as behind pension income. The above points out that in Vojvodina, Šumadija and

Western Serbia, as well as in Southern and Eastern Serbia the importance of primary sector, should be increased. The importance of income generated on this basis should increase through the affirmation of a modern approach to agriculture and occupation farmer. This could reduce the poverty rate in these regions, while increase employment.

Looking at urban areas by regions, regular salaries and wages and pensions are the dominant sources of income. Income from agriculture, hunting and fishing has no statistical significance in the urban areas of the observed regions, except in Vojvodina, where they are still very significant, but less than in rural areas.

Generally speaking, linking agriculture with the tertiary sector through the development of rural tourism, as well as with the secondary sector through the development of small and medium-sized enterprises in the processing of primary agricultural products, could be best achieved in the Vojvodina, then Šumadija and Western Serbia and also the Southern and Eastern Serbia. In the Belgrade Region the development of agriculture and its strong integration with other sectors would not have significance and extraordinary success, given that it is an urban region and that the primary sector, as well as agricultural revenues are lower than in other regions. Thereby, the experience of the Republic of Serbia could be useful for others.

The basic hypothesis of this paper is confirmed for all regions except Belgrade, which means that in extremely rural regions, i.e. in those regions where the primary sector is significant, it is extremely important to encourage integrated rural development concept.

Since in all regions there is a higher employment in the tertiary and secondary sectors in relation to the primary sector, and agriculture is the dominant economic activity in rural areas, i.e. extremely rural regions of the Republic of Serbia, they should be based on the differentiation of employment, i.e. develop the secondary sector, through the processing industry in rural areas, as well as the tertiary sector, through rural tourism. On the basis of such employment, more non-agricultural income would be generated. Given that these incomes dominate in rural as well as urban areas, this would reduce the difference in relation to urban areas.

Raising the capacity of the poor to participate in the better-paid types of rural nonfarm employment (RNFE) is crucial - via employment skills training, education, infrastructure, credit, etc. RNFE has grown fastest and been most poverty-alleviating where there are dynamic growth motors, in particular in the agricultural sector, but also in tourism, links to urban areas, mining and forestry (Reardon et al., 2001).

The Belgrade Region in relation to other highly rural regions in Serbia dominates in terms of employment in the tertiary sector, while rural regions are more dominant in terms of primary and secondary sector, so in these regions it is necessary to develop processing capacities of agricultural products and connect agriculture with industry and tertiary sector (through rural tourism, delivery of produced organic products, handicrafts and other sights of rural areas).

Emphasis needs to be on the importance of designing a development strategy that links agriculture and other sectors. Over the longer term, thriving industrial and service sectors are required so as to sustain the dynamism of the whole economy and achieve the eradication of rural and urban poverty. Agriculture has inherent limitations as an engine for growth over the longer term while industry has a greater potential to generate technological innovations. Services play an increasingly vital part in the generation of innovations as well as in the diffusion of knowledge and information which will raise productivity in agriculture and industry. Services can also provide a bridge between agriculture and industry (Kay, 2009).

Programmes for rural development should aim to enhance the contribution of both agricultural and non-agricultural sectors to poverty alleviation by strengthening linkages between the sectors (Makhura, 2001). This is especially important because all rural areas are dominated by income from employment, as well as pensions (acquired on the basis of length of employment), although agriculture is the dominant economic activity in these areas. Therefore, the population of these areas should have jobs on the basis of which they will earn that income, and these jobs can be created in these areas by developing industry (processing facilities for agricultural products), as well as developing rural tourism and agencies by local governments that will promote these areas in the country and the world.

Rural development is a multidimensional phenomenon. Local government is often the centrepiece of rural political systems. Interventions to reconfigure local government are therefore quintessentially rural development initiatives (Douglas, 2005). Non-farm incomes dominate in urban areas, which is additional reason for their support in rural areas, too, in order to minimize the gap between these areas.

Rural–urban linkages play a crucial role in the generation of income, employment and wealth. It should be noted that many people in rural areas engage in urban activities, such as manufacturing and service provision and, likewise, many people in urban areas engage in agricultural production, either for household consumption or for sale or both. The rural and urban economies are therefore interdependent and complementary. Rural and urban development must be brought together in the planning process and an attention should be given to the decentralization of government. Stronger rural–urban linkages could play a crucial role in poverty reduction and sustainable development in developing countries (Akkoyunlu, 2015).

As revenues from agriculture are more pronounced in rural areas than in urban areas, the development of other sectors in rural areas should be done in cohesion and connection with the agricultural sector, adoption of relevant strategy and involvement of the local governments.

References

Akkoyunlu, S. (2015). The potential of rural–urban linkages for sustainable development and trade. *International Journal of Sustainable Development & World Policy, 4(2),* 20-40. Doi: https://doi.org/10.18488/JOURNAL.26/2015.4.2/26.2.20.40

Amekawa, Y. (2011). Agroecology and sustainable livelihoods: towards an integrated approach to rural development. *Journal of Sustainable Agriculture, 35*(2)*,* 118–162. Doi: https://doi.org/10.1080/10440046.2011.539124.

Bański, J. (2018). The future of rural Poland: the main trends and possible scenario. *Eastern European Countryside*, *23(1),* 71-102. Doi: https://doi.org/10.1515/eec-2017-0004.

De Janvry, A., & Sadoulet, E. (2005). Achieving success in rural development: toward implementation of an integral approach. *Agricultural Economics, 32*, 75–89. Doi: https://doi.org/10.1111/j.0169-5150.2004.00015.x.

Douglas, D. (2005). The restructuring of local government in rural regions: a rural development perspective. *Journal of Rural Studies, 21*(2), 231-246. Doi: https://doi.org/10.1016/j.jrurstud.2005.01.003.

Gutman, P. (2007). Ecosystem services: Foundations for a new rural–urban compact. *Ecological Economics, 62*(3-4), 383–387. Doi: https://doi.org/10.1016/j.ecolecon.2007.02.027.

Kay, C. (2009). Development strategies and rural development: exploring synergies, eradicating poverty. *The Journal of Peasant Studies, 36*(1), 103–137. Doi: https://doi.org/10.1080/03066150902820339

Kilkenny, M. (2010). Urban/regional economics and rural development. *Journal of Regional Science, 50(1),* 449-470. Doi: https://doi.org/10.1111/j.1467-9787.2009.00661.x.

Knickel, K., & Renting, H. (2000). Methodological and conceptual issues in the study of multifunctionality and rural development. *Sociologia Ruralis, 40*(4), 512–528. Doi: https://doi.org/10.1111/1467-9523.00164.

Kvrgić, G., & Ristić, L. (2018). Unutrašnj izazovi održivog razvoja ruralnih područja Republike Srbije. *Naučne publikacije državnog Univerziteta u Novom Pazaru, Serija B: Društvene & humanističke nauke, 1(1),* 28-46.

Leupolt, M. (1977). Integrated rural development: key elements of an integrated rural development strategy. *Sociologia Ruralis, 17*(1), 7-28. Doi: https://doi.org/10.1111/j.1467-9523.1977.tb00849.x.

Makhura, M. (2001). Patterns of relationships between farm and nonfarm sources of income in the rural areas of the Northern Province. *Agrekon: Agricultural Economics Research, Policy and Practice in Southern Africa, 40*(2), 259–268. Doi: https://doi.org/10.1080/03031853.2001.9524949.

Martinovska Stojcheska, A., Kotevska, A., Bogdanov, N., & Nikolić, A. (2016). How do farmers respond to rural development policy challenges? Evidence from Macedonia, Serbia and Bosnia and Herzegovina. *Land Use Policy, 59*, 71–83. Doi: https://doi.org/10.1016/j.landusepol.2016.08.019.

OECD. (2011). *OECD regional typology*. Retrieved October 10, 2019, from https:/www.oecd.org/cfe/regionalpolicy/OECD_regional_typology_Nov2012.pdf

Pawlak, K., Kołodziejczak, M., & Xie, Y. (2019). Horizontal integration in the agricultural sector as a factor increasing its competitiveness – experience from Poland. *Eastern European Countryside, 25*(1), 195-232. Doi: https://doi.org/10.12775/eec.2019.008.

Pejanović, R., Glavaš-Trbić, D., & Tomaš-Simin, M. (2017). Problems of agricultural and rural development in Serbia and necessity of new agricultural policy. *Economics of Agriculture, 64*(4), 1619-1633. Doi: https://doi.org/10.5937/ekoPolj1704619P.

Perger, E. (2016). Local responses to the structural changes of national development policy in Hungarian rural regions. *Eastern European Countryside, 22*(1), 69-83. Doi: https://doi.org/10.1515/eec-2016-0004.

Ploeg, J.D. van der, Renting, H., Brunori, G., Knickel, K., Mannion, J., Marsden, T., de Roest, K., Sevilla-Guzmán, E. & Ventura, F. (2000). Rural development: from practices and policies towards theory. *Sociologia Ruralis, 40*(4), 391-408. Doi: https://doi.org/10.1111/1467-9523.00156.

Reardon, T., Berdegué, J., & Escobar, G. (2001). Rural nonfarm employment and incomes in Latin America: overview and policy implications. *World Development, 29*(3), 395–409. Doi: https://doi.org/10.1016/S0305-750X(00)00112-1.

Reardon, T., Stamoulis, K., & Pingali, P. (2007). Rural nonfarm employment in developing countries in an era of globalization. *Agricultural Economics, 37,* 173–183. Doi: https://doi.org/10.1111/j.1574-0862.2007.00243.x.

Rikalović, G., Molnar, D., & Mikić, H. (2017). Regionalizacija Srbije i EU fondovi. *Acta economica, 15*(26), 199-220. Doi: https://doi.org/10.7251/ACE1726199R

Ristić, L. (2013). Strategijsko upravljanje održivim ruralnim razvojem u Republici Srbiji. *Ekonomski horizonti, 15*(3), 229-243. Doi: https://doi.org/10.5937/ekonhor1303229R

Statistical Office of the Republic of Serbia. (2010-2017). *Publications*. Retrieved October 10, 2019, from https://www.stat.gov.rs/.

Tacoli, C. (2013). The links between urban and rural development. *Environment & Urbanization, 15(1),* 3-12. Doi: https://doi.org/10.1177/095624780301500111

Todorović, M., Drobnjaković, M., & Gligić-Simeunović, A. (2010). Specifics of rural areas of Serbia from the aspects of regional development. *Economics of Agriculture, 57*(2), 605-612.

Woods, M., & McDonagh, J. (2011). Rural Europe and the world: globalization and rural development (Editorial). *European Countryside, 3*(3), 153-163. Doi: https://doi.org/10.2478/v10091-012-0001-z.

Zekić, S., Matkovski, B., & Kleut, Ž. (2016). IPARD fondovi u funkciji razvoja ruralnih područja Republike Srbije. *Ekonomski horizonti, 18*(2), 169-180. Doi: https://doi.org/10.5937/ekonhor1602169Z

Reviewers of the journal "Anali Ekonomskog fakulteta u Subotici" in 2021

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Viktorija Perov, Univerzitet u Novom Sadu, Ekonomski fakultet u Subotici

Техничко упутство за форматирање радова

Цитати и библиографија

Рад треба да садржи следеће:

Наслов рада (не више од 10 речи) на енглеском језику.

Поднаслов (опционо) на енглеском језику.

Подаци о ауторима: име, презиме, звање и институција на енглеском језику.

Апстракт рада максималне дужине 200 речи на енглеском језику.

Кључне речи (не више од 10) на енглеском језику.

Текст рада на енглеском, максималног обима 12 страница.

Листу референци.

Формат странице: Б5.

Маргина: 2 цм свака.

Фонт: TimesNewRoman, величине 10.5 (важи и за наслове, поднаслове, називе слика, називе табела, апстракт, кључне речи итд).

Апстракт и кључне речи позиционирати одмах на почетку текста. Наслови, поднаслови, називи табела, илустрација, слика итд. треба да су нумерисани арапским бројевима.

Слике, илустрације, схеме је потребно приложити у .jpg формату (резолуције 300*300 DPI), или у векторском облику (.wmf или .cdr) са приложеним фонтовима или фонтовима претвореним у криве.

Слике, илустрације и схеме треба да су GRAYSCALE. За текст у сликама, илустрацијама и схемама је пожељно користити фонт Arial, величине 9pt.

Литературу треба навести абецедним редом.

1. Листа референци

У референцама се извори (нпр. књига, чланак у стручном часопису или интернет страница) наводе довољно детаљно да читаоци могу да их идентификују и консултују. Референце се стављају на крај рада, а извори се наводе абецедно (а) по презименима аутора или (б) по насловима извора (ако аутор није познат). Више извора од истог аутора се наводи хронолошки, почев од најранијег, нпр.

Љубојевић, Т.К. (1998).
Љубојевић, Т.К. (2000а).
Љубојевић, Т.К. (2000б).
Љубојевић, Т.К., & Димитријевић, Н.Н. (1994).

Референце иностраних аутора и иностраних институција (самом тексту и у литератури) се наводе латиничним писмом. Референце домаћих аутора се наводе ћириличним писмом, изузев наслова радова на енглеском језику или евентуално назива часописа (уколико је реч о часопису који се публикује на енглеском језику).

А. Часописи и остале периодичне публикације

Аутори се наводе по презимену, уз прво слово имена. Година објављивања се пише у заградама, иза којих се ставља тачка. Наслов чланка на енглеском језику пише се у *Sentence case*, односно велико слово се користи само на почетку наслова и код личних именица. Наслов часописа на енглеском језику пише се у *Title case*, односно све променљиве врсте речи се пишу великим почетним словом. Иза наслова часописа ставља се број годишта, који се пише курзивом:

Аутор, А., Аутор, Б. и Аутор, Ц. (година). Наслов чланка. *Наслов часописа, број годишта*(број свеске), странице.

➲ **Чланак једног аутора, из стручног часописа пагинираног по свескама**
Часописи који се пагинирају по свескама почињу страном 1 у свакој свесци, тако да се број свеске наводи у заградама након броја годишта. Заграде и број свеске се не пишу курзивом:

Танасијевић, В. (2007). A PHP project test-driven end to end. *Management Information Systems, 5* (1), 26-35.

Begg, D. (2007). A PHP project test-driven end to end. *Management Information Systems, 5* (1), 26-35.

➲ **Чланак једног аутора, из стручног часописа пагинираног по годиштима**
Часописи који се пагинирају по годиштима почињу страном 1 у свесци 1, а бројеви страница се настављају у свесци 2 тамо где се свеска 1 завршила, нпр.

Перић, О. (2006). Bridging the gap: Complex adaptive knowledge management. *Strategic Management, 14*, 654-668.

Begg, D. (2006). Bridging the gap: Complex adaptive knowledge management. *Strategic Management, 14*, 654-668.

➲ **Чланак два аутора, из стручног часописа пагинираног по свескама**

Стракић, Ф., и Мирковић, Д. (2006). The role of the user in the software development life cycle. *Management Information Systems, 4* (2), 60-72.

Begg, D., и Burda, M. (2006). The role of the user in the software development life cycle. *Management Information Systems, 4* (2), 60-72.

➲ **Чланак два аутора, из стручног часописа пагинираног по годиштима**

Љубојевић, К., и Димитријевић, М. (2007). Choosing your CRM strategy. *Strategic Management, 15*, 333-349.

➲ **Чланак три до шест аутора, из стручног часописа пагинираног по свескама**

Јованов, Н., Бошков, Т., и Стракић, Ф. (2007). Data warehouse architecture. *Management Information Systems, 5* (2), 41-49.

➲ **Чланак три до шест аутора, из стручног часописа пагинираног по годиштима**

Бошков, Т., Љубојевић, К., и Танасијевић, В. (2005). A new approach to CRM. *Strategic Management, 13*, 300-310.

➲ **Чланак више од шест аутора, из стручног часописа пагинираног по свескама**

Љубојевић, К., Димитријевић, М., Мирковић, Д., Танасијевић, В., Перић, О., Јованов, Н., et al. (2005). Putting the user at the center of software testing activity. *Management Information Systems, 3* (1), 99-106.

➲ **Чланак више од шест аутора, из стручног часописа пагинираног по годиштима**

Стракић, Ф., Мирковић, Д., Бошков, Т., Љубојевић, К., Танасијевић, В., Димитријевић, М., et al. (2003). Metadata in data warehouse. *Strategic Management, 11*, 122-132.

➲ **Чланак из часописа**

Стракић, Ф. (2005, October 15). Remembering users with cookies. *IT Review*, *130*, 20-21.

➲ **Ауторизовани чланак из билтена**

Димитријевић, М. (2009, September). MySql server, writing library files. *Computing News, 57,* 10-12.

➲ **Неауторизовани чланак из билтена**

VBScript with active server pages. (2009, Septembar). *Computing News, 57,* 21-22.

Б. Књиге, брошуре, поглавља из књига, енциклопедијске одреднице, критике и рецензије

Основни формат за књиге

Аутор, А. А. (Година издања). *Наслов дела: Велико почетно слово и у поднаслову*. Место: Издавач.

Напомена: Реч „место" увек означава град, али треба навести и земљу уколико град истог имена постоји у више држава.

➲ **Књига једног аутора**

Љубојевић, К. (2005). *Prototyping the interface design*. Суботица: Економски факултет.

➲ **Књига једног аутора, ново издање**

Димитријевић, М. (2007). *Customer relationship management* (6. izd.). Суботица: Економски факултет.

➲ **Књига два аутора**

Љубојевић, К., Димитријевић, М. (2007). *The enterprise knowledge portal and its architecture*. Суботица: Економски факултет.

➲ **Књига три до шест аутора**

Љубојевић, К., Димитријевић, М., Мирковић, Д., Танасијевић, В., и Перић, О. (2006). *Importance of software testing*. Суботица: Економски факултет.

➲ **Књига више од шест аутора**

Мирковић, Д., Танасијевић, В., Перић, О., Јованов, Н., Бошков, Т., Стракић, Ф., et al. (2007). *Supply chain management*. Суботица: Економски факултет.

➲ **Књига без аутора и уредника**

Web user interface (10. izd.). (2003). Суботица: Економски факултет.

➲ **Група аутора, предузеће, организација или државни орган као аутор**

Статистички завод Републике Србије. (1978). *Статистички годишњак Републике Србије.* Београд: Министарство за комуналне и социјалне службе.

➲ **Збирка**

Димитријевић, М., & Танасијевић, В. (ur.). (2004). *Data warehouse architecture*. Суботица: Економски факултет.

➲ **Поглавље у збирци**

Бошков, Т., и Стракић. Ф. (2008). Bridging the gap: Complex adaptive knowledge management. U T. Boškov i V. Tanasijević (ur.), *The enterprise knowledge portal and its architecture* (str. 55-89). Суботица: Економски факултет.

В. Необјављени радови

➲ **Реферат са научног скупа**

Љубојевић, К., Танасијевић, В., Димитријевић, М. (2003). *Designing a web form without tables*. Реферат саопштен на годишњем скупу Српског компјутерског савеза, Београд.

➲ **Необјављени рад или рукопис**

Бошков, Т., Стракић, Ф., Љубојевић, К., Димитријевић, М., и Перић, О. (2007. мај). *First steps in C++*. Необјављен рад, Економски факултет, Суботица.

➲ **Докторска дисертација**

Стракић, Ф. (2000). *Managing network services: Managing DNS servers*. Необјављена докторска дисертација, Економски факултет Суботица, Суботица.

➲ **Магистарски рад**

Димитријевић, М. (2003). *Structural modeling: Class and object diagrams.* Необјављен магистарски рад, Економски факултет, Суботица.

Г. Електронски медији

За чланке објављене на интернету важе иста упуства као за радове објављене у штампи. Наводе се сви подаци наведени у интернет извору, укључујући и број часописа у заградама.

Аутор, А., & Аутор, Б. (Датум објављивања). Наслов чланка. *Наслов интернет часописа, број годишта*(број часописа ако је назначен). Преузето са сајта http://www.anyaddress.com/full/url/

➲ **Чланак у интернет часопису**

Танасијевић, В. (март 2003.). Putting the user at the center of software testing activity. *Strategic Management*, *8* (4). Преузето 7. октобра 2004. са сајта www.ef.uns.ac.rs/sm2003

➲ **Документ организације**

Економски факултет Суботица. (5. март 2008.). *A new approach to CRM*. Преузето 25. јула 2008. са сајта http://www.ef.uns.ac.rs/papers/acrm.html

➲ **Чланак из интернет часописа са додељеним DOI**

За чланке у интернет часопису без DOI (идентификатора дигиталног објекта) навести URL.

Аутор, А., и Аутор, Б. Б. (Датум објављивања). Наслов чланка. *Назив часописа, број годишта*. Преузето са сајта http://www.anyaddress.com/full/url/

Јованов, Н., и Бошков, Т. (4. фебруар 2007.) A PHP project test-driven end to end. *Management Information Systems*, 2 (2), 45-54. Преузето са сајта http://www.ef.uns.ac.rs/mis/TestDriven.html.

2. Цитати из извора у тексту рада

➲ **Цитати**

Уколико се извор цитира дословце, наводи се име аутора, година издања и страница са које је цитат преузет (са назнаком "стр."). Цитат се уводи фразом која садржи ауторово презиме, а иза њега се ставља година објављивања у заградама.

> По Мирковићу (2001), „Примена складишта података може да буде ограниченог карактера, нарочито ако иста садрже поверљиве податке" (стр. 201).
>
> Мирковић (2001) сматра да „примена складишта података може да буде ограниченог карактера" (стр. 201). Какве неочекиване последице то има по обим доступности?

Уколико се у уводној фрази не именује аутор, на крај цитата се ставља ауторово презиме, година издања и број странице у заградама, нпр.

> Он сматра да „примена складишта података може да буде ограниченог карактера", али не објашњава могуће последице (Мирковић, 2001, стр. 201).

➲ **Резиме или парафраза**

> По Мирковићу (1991), ограничења у погледу употребе базе података могу бити ванског или софтверског карактера, или пак привремена или чак произвољна (стр. 201).
>
> Ограничења у погледу употребе базе података могу бити ванског или софтверског карактера, или пак привремена или чак произвољна (Мирковић, 1991, стр. 201).

➲ **Један аутор**

> Бошков (2005) упоређује обим приступа...
> Begg (2005) упоређује обим приступа...
>
> У једном раном истраживању обима приступа (Бошков, 2005), установљено је...

➲ У случају да има **два аутора**, увек се наводе оба имена:

> У једном другом истраживању (Мирковић и Бошков, 2006) закључује се да...

➲ У случају да има **три до пет аутора**, први пут се наводи свих пет аутора. Код наредних навода, наводи се име првог аутора, иза кога се ставља „и сар.".

> (Јованов, Бошков, Перић, Бошков, и Стракић, 2004).

Када се исти аутори наводе следећи пут, користи се име само првог аутора, иза кога се ставља „и сар.” у уводној фрази или заградама:

> По Јованову и сар. (2004), када се такав феномен јави поново, медији му обично посвећују далеко више пажње.
>
> Када се такав феномен јави поново, медији му обично посвећују далеко више пажње (Јованов и сар., 2004).

У енглеском тексту, иза „et” у „et al.” не ставља се тачка.

➲ **Шест или више аутора**

У уводној фрази се презиме првог аутора наводи у уводној фрази или у заградама:

> Yossarian и сар. (2004) тврде да...
>
> ...није релевантно (Yossarian i sar., 2001).

➲ **Неименован аутор**

Уколико дело није ауторизовано, извор се наводи по наслову у уводној фрази, или се прве 1-2 речи ставе у заграде. Наслови књига и извештаја се пишу курзивом, док се наслови чланака и поглавља стављају у наводнике:

> Слична анкета је спроведена у једном броју организације које имају стално запослене менаџере базе података (“Limiting database access”, 2005).

Уколико неко дело (нпр. реч уредника у новинама) нема аутора, наводи се првих неколико речи наслова, уз годину објављивања:

> (“The Objectives of Access Delegation,” 2007)

Напомена: У ретким случајевима кад је аутор потписан речју „Anonymous”, иста се сматра именом аутора (Anonymous, 2008). У том случају се у списку извора на крају рада као име аутора користи реч „Anonymoys”.

➲ **Организација или државни орган као аутор**

Уколико је аутор нека организација или државни орган, назив организације се ставља у уводну фразу или заграде први пут кад се извор наводи:

> По подацима Статистичког завода Републике Србије (1978), ...

Исто тако, код првог навођења се исписује пуни назив колективног аутора, уз скраћеницу у угластим заградама. Затим се код следећих навода користи скраћени назив:

> Преглед је ограничен на градове од 10.000 становника навише (Статистички завод Републике Србије [СОРС], 1978).
>
> Списак не садржи школе које су у претходном статистичком прегледу наведене као затворене (СОРС, 1978).

➲ Када се наводи **више од једног дела истог аутора**:

> (Безјак, 1999, 2002)

- Када је **више од једног дела истог аутора објављено исте године**, наводе се са словима а, б, ц, итд. иза године издања:

  (Griffith, 2002a, 2002b, 2004)

- **Два или више дела истог аутора објављена исте године**

Уколико су два или више извора коришћена у достављеном раду објављена од стране истог аутора исте године, ставке у списку референци се означавају малим словом (а, б, ц...) иза године. Мало слово се користи и код навођења извора унутар текста:

  Резултати анкете објављени код Theissena (2004a) показују да...

- Уколико нисте прочитали оригинално дело, наводи се аутор који Вас је упутио на исто:

  Бергсоново истраживање (поменуто код Мирковића и Бошкова, 2006)...

  Овде се у списку извора наводе Мирковић и Бошков (2006), а Бергсон не.

- Кад се наводи **више од једног аутора**, аутори се наводе абецедним редом:

  (Britten, 2001; Styrlasson, 2002; Wasserwandt, 1997)

- Кад нема **датума или године објављивања**:

  (Hessenberg, n.d.)

- **Код цитата се увек наводе странице:**

  (Мирковић и Бошков, 2006, стр. 12)
  (Begg i Burda, 2006, стр. 12)

  Мирковић и Бошков (2006, стр. 12) предлажу приступ по коме "почетно гледиште…

- **Навођење појединих делова дела:**

  (Theissen, 2004a, pogl. 3)

  (Keaton, 1997, str. 85-94)

- **Лична комуникација, и то интервјуи, писма, интерне поруке, е-маилови и телефонски разговори**, наводе се на следећи начин. (*Не* уносе се у списак извора.)

  (К. Љубојевић, лична комуникација, 5. мај 2008.).

3. Фусноте

Понекад се неко питање покренуто у тексту мора додатно обрадити у фуснотама, у којима се додаје нешто што је индиректној вези са темом, или дају додатне техничке информације. Фусноте се нумеришу експонентом, арапским бројевима на крају реченице, овако.[1] Фусноте на крају текста (*endnote*) се започињу на посебној страни, иза текста. Међутим, Уређивачки одбор часописа **не препоручује коришћење фуснота и завршних напомена**.

Technical instructions for paper formatting

Citations and Bibliography

The paper should consist of:

Title of the paper (no more than 10 words) in English.

Subtitle (optional) in English.

Personal data of authors/coauthors: name, surname, title and Institution in English.

Abstract of 200 words or less, giving the factual essence of the article, should be written in English.

Key words (no more than 10) in English.

Text of the paper, in English, cannot exceed 12 pages.

Bibliography.

Guidelines for the paper format

Type your work in a common Word Processor (e.g. MS Word).

Page format: B5.

Margin: 2 cm every

Font: Times New Roman, size 11 (use it for title, subtitle, figures, tables, abstract, key words, and so on).

Titles, subtitles, names of the tables, illustrations, figures, etc should be written in Arabic numerals.

Figures, illustrations and schemes should be enclosed in the .jpg format (resolution 300*300 dpi) or in the vector form (.wmf or cdr) with enclosed fonts or fonts transformed in curves. Figures, illustrations and schemes should be black-and-white (grayscale). For the texts included in figures, illustrations and schemes font Arial, size 9 pt is preferred.

1. Referencing Guide

The references should specify the source (such as book, journal article or a web page) in sufficient detail to enable the readers to identify and consult it. The references are placed at the end of the work, with sources listed alphabetically (a) by authors' surnames or (b) by the titles of the sources (if the author is unknown). Multiple entries by the same author(s) must be sequenced chronologically, starting from the earliest, e.g.:

Ljubojević, T.K. (1998).
Ljubojević, T.K. (2000a).
Ljubojević, T.K. (2000b).
Ljubojević, T.K., & Dimitrijević, N.N. (1994).

Here is a list of the most common reference types:

A. Periodicals

Authors must be listed by their last names, followed by initials. Publication year must be written in parentheses, followed by a full stop. Title of the article must be in sentences case: only the first word and proper nouns in the title are capitalized. The periodical title must be in title case, followed by the volume number, which is also italicized:

Author, A. A., Author, B. B., & Author, C. C. (Year). Title of article. *Title of Periodical, volume number*(issue number), pages.

➲ Journal article, one author, paginated by issue

Journals paginated by issue begin with page 1 in every issue, so that the issue number is indicated in parentheses after the volume. The parentheses and issue numbers are not italicized, e.g.

Tanasijević, V. (2007). A PHP project test-driven end to end. *Management Information Systems, 5* (1), 26-35.

➲ Journal article, one author, paginated by volume

Journals paginated by volume begin with page 1 in issue 1, and continue page numbering in issue 2 where issue 1 ended, e.g.

Perić, O. (2006). Bridging the gap: Complex adaptive knowledge management. *Strategic Management, 14*, 654-668.

➲ Journal article, two authors, paginated by issue

Strakić, F., & Mirković, D. (2006). The role of the user in the software development life cycle. *Management Information Systems, 4* (2), 60-72.

➲ Journal article, two authors, paginated by volume

Ljubojević, K., & Dimitrijević, M. (2007). Choosing your CRM strategy. *Strategic Management, 15*, 333-349.

➲ **Journal article, three to six authors, paginated by issue**

Jovanov, N., Boškov, T., & Strakić, F. (2007). Data warehouse architecture. *Management Information Systems, 5* (2), 41-49.

➲ **Journal article, three to six authors, paginated by volume**

Boškov, T., Ljubojević, K., & Tanasijević, V. (2005). A new approach to CRM. *Strategic Management, 13*, 300-310.

➲ **Journal article, more than six authors, paginated by issue**

Ljubojević, K., Dimitrijević, M., Mirković, D., Tanasijević, V., Perić, O., Jovanov, N., et al. (2005). Putting the user at the center of software testing activity. *Management Information Systems, 3* (1), 99-106.

➲ **Journal article, more than six authors, paginated by volume**

Strakić, F., Mirković, D., Boškov, T., Ljubojević, K., Tanasijević, V., Dimitrijević, M., et al. (2003). Metadata in data warehouse. *Strategic Management, 11*, 122-132.

➲ **Magazine article**

Strakić, F. (2005, October 15). Remembering users with cookies. *IT Review*, *130*, 20-21.

➲ **Newsletter article with author**

Dimitrijević, M. (2009, September). MySql server, writing library files. *Computing News, 57,* 10-12.

➲ **Newsletter article without author**

VBScript with active server pages. (2009, September). *Computing News,57,* 21-22.

B. Books, Brochures, Book Chapters, Encyclopedia Entries, And Book Reviews

Basic format for books

Author, A. A. (Year of publication). *Title of work: Capital letter also for subtitle*. Location: Publisher.

Note: "Location" always refers to the town/city, but you should also include the state/country if the town/city could be mistaken for one in another country.

➲ **Book, one author**

Ljubojević, K. (2005). *Prototyping the interface design*. Subotica: Faculty of Economics.

➲ **Book, one author, new edition**

Dimitrijević, M. (2007). *Customer relationship management* (6th ed.). Subotica: Faculty of Economics.

➲ **Book, two authors**

Ljubojević, K., Dimitrijević, M. (2007). *The enterprise knowledge portal and its architecture*. Subotica: Faculty of Economics.

➲ **Book, three to six authors**

Ljubojević, K., Dimitrijević, M., Mirković, D., Tanasijević, V., & Perić, O. (2006). *Importance of software testing*. Subotica: Faculty of Economics.

➲ **Book, more than six authors**

Mirković, D., Tanasijević, V., Perić, O., Jovanov, N., Boškov, T., Strakić, F., et al. (2007). *Supply chain management*. Subotica: Faculty of Economics.

➲ **Book, no author or editor**

Web user interface (10th ed.). (2003). Subotica: Faculty of Economics.

➲ **Group, corporate, or government author**

Statistical office of the Republic of Serbia. (1978). *Statistical abstract of the Republic of Serbia.* Belgrade: Ministry of community and social services.

➲ **Edited book**

Dimitrijević, M., & Tanasijević, V. (Eds.). (2004). *Data warehouse architecture*. Subotica: Faculty of Economics.

➲ **Chapter in an edited book**

Boškov, T., & Strakić. F. (2008). Bridging the gap: Complex adaptive knowledge management. In T. Boškov & V. Tanasijević (Eds.), *The enterprise knowledge portal and its architecture* (pp. 55-89). Subotica: Faculty of Economics.

➲ **Encyclopedia entry**

Mirković, D. (2006). History and the world of mathematicians. In *The new mathematics encyclopedia* (Vol. 56, pp. 23-45). Subotica: Faculty of Economics.

C. Unpublished Works

➲ **Paper presented at a meeting or a conference**

Ljubojević, K., Tanasijević, V., Dimitrijević, M. (2003). *Designing a web form without tables*. Paper presented at the annual meeting of the Serbian computer alliance, Beograd.

➲ **Paper or manuscript**

Boškov, T., Strakić, F., Ljubojević, K., Dimitrijević, M., & Perić, O. (2007. May). *First steps in visual basic for applications*. Unpublished paper, Faculty of Economics Subotica, Subotica.

➲ **Doctoral dissertation**

Strakić, F. (2000). *Managing network services: Managing DNS servers*. Unpublished doctoral dissertation, Faculty of Economics Subotica, Subotica.

➲ **Master's thesis**

Dimitrijević, M. (2003). *Structural modeling: Class and object diagrams.* Unpublished master's thesis, Faculty of Economics Subotica, Subotica.

D. Electronic Media

The same guidelines apply for online articles as for printed articles. All the information that the online host makes available must be listed, including an issue number in parentheses:

Author, A. A., & Author, B. B. (Publication date). Title of article. *Title of Online Periodical, volume number*(issue number if available). Retrieved from http://www.anyaddress.com/full/url/

➲ **Article in an internet-only journal**

Tanasijević, V. (2003, March). Putting the user at the center of software testing activity. *Strategic Management*, *8* (4). Retrieved October 7, 2004, from www.ef.uns.ac.rs/sm2003

➲ **Document from an organization**

Faculty of Economics. (2008, March 5). *A new approach to CRM*. Retrieved July 25, 2008, from http://www.ef.uns.ac.rs/papers/acrm.html

➲ **Article from an online periodical with DOI assigned**

Jovanov, N., & Boškov, T. A PHP project test-driven end to end. *Management Information Systems*, 2 (2), 45-54. doi: 10.1108/06070565717821898.

➲ **Article from an online periodical without DOI assigned**

Online journal articles without a DOI require a URL.

Author, A. A., & Author, B. B. (Publication date). Title of article. *Title of Journal, volume number*. Retrieved from http://www.anyaddress.com/full/url/

Jovanov, N., & Boškov, T. A PHP project test-driven end to end. *Management Information Systems*, 2 (2), 45-54. Retrieved from http://www.ef.uns.ac.rs/mis/TestDriven.html.

2. Reference Quotations in the Text

➲ **Quotations**

If a work is directly quoted from, then the author, year of publication and the page reference (preceded by "p.") must be included. The quotation is introduced with an introductory phrase including the author's last name followed by publication date in parentheses.

> According to Mirković (2001), "The use of data warehouses may be limited, especially if they contain confidential data" (p. 201).
>
> Mirković (2001), found that "the use of data warehouses may be limited" (p. 201). What unexpected impact does this have on the range of availability?

If the author is not named in the introductory phrase, the author's last name, publication year, and the page number in parentheses must be placed at the end of the quotation, e.g.

> He stated, "The use of data warehouses may be limited," but he did not fully explain the possible impact (Mirković, 2001, p. 201).

➲ **Summary or paraphrase**

> According to Mirković (1991), limitations on the use of databases can be external and software-based, or temporary and even discretion-based. (p.201)
>
> Limitations on the use of databases can be external and software-based, or temporary and even discretion-based (Mirković, 1991, p. 201).

➲ **One author**

> Boškov (2005) compared the access range…
>
> In an early study of access range (Boškov, 2005), it was found...

➲ When there are **two authors**, both names are always cited:

> Another study (Mirković & Boškov, 2006) concluded that…

➲ If there are **three to five authors**, all authors must be cited the first time. For subsequent references, the first author's name will cited, followed by "et al.".

> (Jovanov, Boškov, Perić, Boškov, & Strakić, 2004).

In subsequent citations, only the first author's name is used, followed by "et al." in the introductory phrase or in parentheses:

> According to Jovanov et al. (2004), further occurences of the phenomenon tend to receive a much wider media coverage.
>
> Further occurences of the phenomenon tend to receive a much wider media coverage (Jovanov et al., 2004).

In "et al.", "et" is not followed by a full stop.

➲ Six or more authors

The first author's last name followed by "et al." is used in the introductory phrase or in parentheses:

> Yossarian et al. (2004) argued that…
>
> … not relevant (Yossarian et al., 2001).

➲ Unknown author

If the work does not have an author, the source is cited by its title in the introductory phrase, or the first 1-2 words are placed in the parentheses. Book and report titles must be italicized or underlined, while titles of articles and chapters are placed in quotation marks:

> A similar survey was conducted on a number of organizations employing database managers ("Limiting database access", 2005).

If work (such as a newspaper editorial) has no author, the first few words of the title are cited, followed by the year:

> ("The Objectives of Access Delegation," 2007)

Note: In the rare cases when the word "Anonymous" is used for the author, it is treated as the author's name (Anonymous, 2008). The name Anonymous must then be used as the author in the reference list.

➲ Organization as an Author

If the author is an organization or a government agency, the organization must be mentioned in the introductory phrase or in the parenthetical citation the first time the source is cited:

> According to the Statistical Office of the Republic of Serbia (1978), …

Also, the full name of corporate authors must be listed in the first reference, with an abbreviation in brackets. The abbreviated name will then be used for subsequent references:

> The overview is limited to towns with 10,000 inhabitants and up (Statistical Office of the Republic of Serbia [SORS], 1978).
>
> The list does not include schools that were listed as closed down in the previous statistical overview (SORS, 1978).

➲ When citing **more than one reference from the same author**:

> (Bezjak, 1999, 2002)

➲ When several **used works by the same author were published in the same year**, they must be cited adding a, b, c, and so on, to the publication date:

> (Griffith, 2002a, 2002b, 2004)

➲ **Two or more works in the same parentheses**

When two or more works are cited parenthetically, they must be cited in the same order as they appear in the reference list, separated by a semicolon.

> (Bezjak, 1999; Griffith, 2004)

➲ **Two or more works by the same author in the same year**

If two or more sources used in the submission were published by the same author in the same year, the entries in the reference list must be ordered using lower-case letters (a, b, c…) with the year. Lower-case letters will also be used with the year in the in-text citation as well:

> Survey results published in Theissen (2004a) show that…

➲ To **credit an author for discovering a work**, when you have not read the original:

> Bergson's research (as cited in Mirković & Boškov, 2006)…

Here, Mirković & Boškov (2006) will appear in the reference list, while Bergson will not.

➲ When **citing more than one author**, the authors must be listed alphabetically:

> (Britten, 2001; Sturlasson, 2002; Wasserwandt, 1997)

➲ When there is **no publication date**:

> (Hessenberg, n.d.)

➲ **Page numbers must always be given for quotations**:

> (Mirković & Boškov, 2006, p.12)
>
> Mirković & Boškov (2006, p. 12) propose the approach by which "the initial viewpoint…

➲ **Referring to a specific part of a work**:

> (Theissen, 2004a, chap. 3)
>
> (Keaton, 1997, pp. 85-94)

➲ **Personal communications, including interviews, letters, memos, e-mails, and telephone conversations**, are cited as below. (These are *not* included in the reference list.)

> (K. Ljubojević, personal communication, May 5, 2008).

3. Footnotes and Endnotes

A few footnotes may be necessary when elaborating on an issue raised in the text, adding something that is in indirect connection, or providing supplementary technical information. Footnotes and endnotes are numbered with superscript Arabic numerals at the end of the sentence, like this.[1] Endnotes begin on a separate page, after the end of the text. However, journal **does not recommend the use of footnotes or endnotes.**

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378.633(497.113 Subotica)
330
ANALI Ekonomskog fakulteta u Subotici = The Annals of the Faculty of Economics in Subotica / glavni i odgovorni urednik Nemanja Berber. – 1965, 1 – 1976, 6 ; 1981, 7 ; 1996, 1 – . – Subotica : Ekonomski fakultet, 1965-1976; 1981; 1996–. – 24 cm

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