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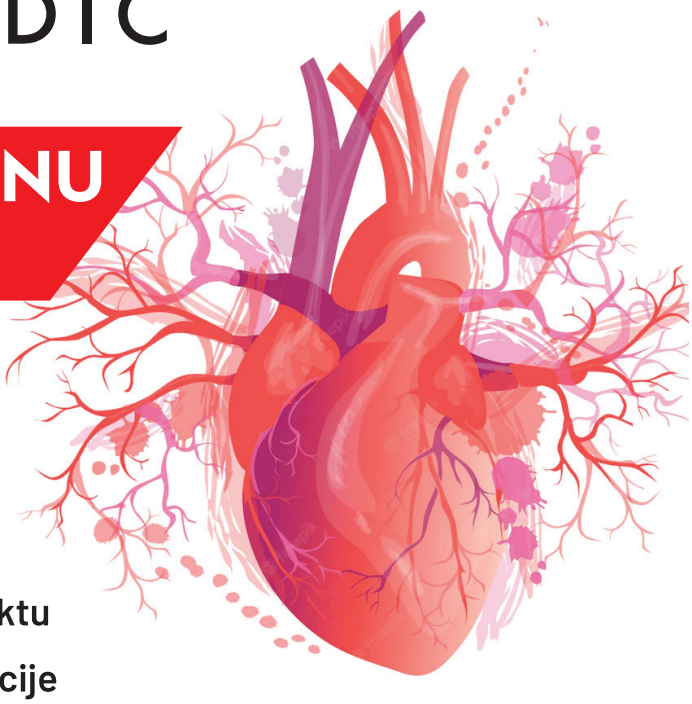
CENTAR ZA INTERVENTNU KARDIOLOGIJU



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Mr sci. med. dr Bojan Ilisić

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Jedan od vodećih stručnjaka za interventu kardiologiju sa dugogodišnjim kliničkim iskustvom stečenim u Srbiji, Monaku, Nemačkoj, Belgiji, Švajcarskoj i Kuvajtu. Dr Ilisić je u oblasti interventne kardiologije izveo više od pet hiljada intervencija.

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This issue of *Ekonomika preduzeća* starts with two forward-thinking articles in the *Marketing* section. A duo of authors, *A. Đorđević* and *A. Miladinović,* observed the influence of four brand dimensions, brand trust, brand awareness, expected quality and meaning, and customer brand loyalty, on the customer value creation. The results of their empirical research revealed that brand awareness and customer brand loyalty far more contributed to value creation than the other two dimensions, which is something that should be considered when devising a branding strategy. In the second paper in this section, *A. Zekavica* presented a comprehensive research aimed at isolating the factors that shape the lifestyle of Generation Z and estimating their impact on the inclination of its members toward the online shopping experience. The author outlined several interesting points that could be quite useful to the marketers who tend to think wisely about the future.

The first paper in the *Management* section, written by *N. Krstić* and *M. Gajić,* deals with a hot topic in human resource management, the effectiveness of virtual teams. More specifically, they investigated the effects of trust factors (individual, institutional and cognitive) and knowledge sharing on the success of virtual teams. The correlation-regression study has shown that all dimensions of trust largely affected the effectiveness of virtual teams, while the impact of knowledge sharing was rather insignificant. Within the same section, a group of authors, including *M. Nedeljković Knežević*, *S. Kovačić, S. Nedeljković* and *M. Mijatov,* explored the effects of job position on the relationship between personality traits and job satisfaction. According to their findings, the employees' job position significantly determines the relationship between personality dimensions, such as neuroticism, conscientiousness and openness to new experiences, and different facets of job satisfaction.

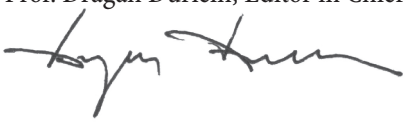
In the *Logistics* section, a trio of authors, *S. Aćimović, V. Mijušković* and *F. Bugarčić,* examined the role of logistics system in improving the performance of companies in different industries. The research conducted on the relevant sample of 298 companies in the Republic of Serbia has shown that the "soft" dimensions of logistics (logistics services and custom procedures) turned out to have a greater impact on business success than the "hard" ones (physical infrastructure). Nevertheless, in order to raise the quality of overall business environment, policy makers must pay attention to the development of all logistics components.

In the first paper in the *Finance* section, *A. Lekpek* analyzed the several aspects of cryptocurrencies and their potential for becoming a viable alternative to traditional currencies. Despite the flourishing opportunities offered by the

cryptocurrency market, there is still a lot to be done to address obvious shortcomings of the cryptocurrency system and enable it to compete with traditional currencies. The second paper in this section, written by *S. Drljača Kanazir,* is dedicated to the assessment of the impact of macroeconomic determinants on loan default rate in Serbia's banking sector. The findings of her research indicate that the exposure to systemic risk increases with the increase in the size of borrowers. Also, the SMEs segment proved far more resistant to the influence of macroeconomic factors and might be looked at as a generator of the financial stability of an economy.

The COVID-19 crisis has caused the sharpest decline in the tourism sector around the world, so the crisis management has come to the fore. In the *Tourism* section, *S. Milićević*, *Ž. Krejić* and *N. Đorđević* evaluated the crisis management measures that were undertaken in high-category hotels in Serbia during the different stages of the COVID-19 pandemic. The authors provide some valuable recommendations that could help hotel managers to navigate safely through various crises.

Prof. Dragan Đuričin, Editor in Chief



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THE INFLUENCE OF DIFFERENT BRAND DIMENSIONS ONTO THE CUSTOMER VALUE CREATION

Uticaj različitih dimenzija brenda na kreiranje vrednosti za potrošače

Abstract

Achieving the competitive advantage on the market is one of the basic business challenges for the market oriented companies. In order to attract the greatest possible number of customers there is a need to create value which shall be recognized by the customers as a superior or a greater one in the process of estimating alternatives compared to the competitive options. Brand is one of the most important determinants in creating value for the customers. Brand is a complex category and during the analysis of its influence onto the value creation it is needed to take into account its different dimensions. In accordance with the concepts of numerous studies in the area of marketing and customer management the influence of brand on value creation for customers is regarded via four main dimensions- brand awareness, developed brand loyalty, brand trust and the possibility to recognize the expected quality and meaning of a certain brand product. The paper uses a research model which encompasses all four brand dimensions and analyzes their influence onto the customer value creation. The empirical research has been carried out on a sample of 174 respondents in Serbia. Based on the gathered empirical data a significant brand dimension for the customers in Serbia has been identified. Based on the gained research results a difference has been tested in the importance of different brand dimensions for men and women. The paper offers significant theoretical and practical implications which indicate what brand dimensions need to be emphasized in the process of product and service branding and to which extent every one of them contributes to the customer growth value. Also, a brand dimension has been identified with a different influence on creating value with men and women, which is an important implication for the marketing strategy.

Keywords: *value creation, brand, customers, brand dimensions, competitive advantage.*

Sažetak

Ostvarivanje konkurentske prednosti na tržištu jedan je od osnovnih poslovnih izazova tržišno orijentisanih preduzeća. Da bi se privukao što veći broj potrošača neophodno je da se kreira vrednost koju će potrošači u procesu procene alternativa prepoznati kao superiornu, odnosno veću u odnosu na konkurentske opcije. Brend je jedna od značajnih determinanti kreiranja vrednosti za potrošače. Brend je kompleksna kategorija i u analizi njegovog uticaja na kreiranje vrednosti neophodno je uzeti u obzir njegove različite dimenzije. U skladu sa konceptima brojnih studija iz oblasti marketinga i upravljanja potrošačima uticaj brenda na kreiranje vrednosti za potrošače posmatra se kroz četiri osnovne dimenzije - brend awerness, razvijene lojalnosti prema brendu, brend trust i mogućnost prepoznavanja očekivanog kvaliteta i značenja proizvoda određenog brenda. U radu se je korišćen istraživački model u kome su uzete u obzir sve četiri dimenzije brenda i analiziran je njihov uticaj na kreiranje vrednosti za potrošače. Empirijsko istraživanje je sprovedeno na uzorku od 174 ispitanika u Srbiji. Na osnovu prikupljenim empirijskih podataka identifikovana je najznačajnija dimenzija brenda za potrošače u Srbiji. Na osnovu dobijenih rezultata istraživanja testirana je razlika u značaju različitih dimenzija brenda za muškarce i žene. Rad pruža značajne teorijsko praktične implikacije koje ukazuju na koje dimenzije brenda je potrebno staviti poseban akcenat u procesu brendiranja proizvoda i usluga, u kojoj meri svaka od njih doprinosi rastu vrednosti za potrošače, Takođe, je identifikovana dimenzija brenda koja ima različit uticaj na kreiranje vrednosti kod muškarce i žene, što je važna implikacija za marketing strategiju.

Ključne reči: *kreiranje vrednosti, brend, potrošači, dimenzije brenda, konkurentska prednost.*

Customer value

Within the global business surroundings customers evaluate on a daily basis the different market alternatives in order to find a product which has the highest value for them in order to satisfy their needs and desires [27]. Creating value is one of the basic business approaches in contemporary companies which enables to establish a sustainable business model based on which a maximum customer value is delivered and the company business advantage achieved by attracting a greater number of customers and improving their satisfaction which contributes to the permanent loyalty development, good relationships and high retention rate [25]. In contemporary business environment creating customer value is the basis for achieving competitive advantage on the market and as such it is one of the basic strategic components of management unifying the implementation of relationship marketing, innovations, organizational culture oriented towards customers, the establishment of technological superiority, cost efficiency and brand management [30]. The modern literature especially emphasizes that company business performance in the long run directly depend on the successfulness of creating and delivering customer value[14].

Based on the comparative analysis of papers from most influential authors, starting from Levitt, who first tried to define the importance and term of customer value, than Drucker, Powers, up to the contemporary authors Kotler and Holbrook, it can be noted that there have been several customer value definitions [12]. Customer value can be defined as a total product usefulness estimate based on the customer perception of what is gained and what needs to be invested in order to possess and use the product or a service [37]. Based on the universal literature analysis of a greater number of authors, the value is a difference between the invested and gained while acquiring, possessing and/or using a product or a service [15,16,23]. The most used definition of value for the customers in contemporary literature is the definition of Maurice Holbrook according to which the customer value is the difference between utility, gained by the customer when buying and using a product or a service, and sacrifices which assume investment while procuring and using that product or a service [15]. The same author adds that the appendix to the definition can be the customer value formula: V (value) = U(utility)- S(sacrifice).

Regardless of several different customer value definitions every deeper analysis of the term points out the two basic characteristics: (1) the value for the customers is delivered through using a product or a service and (2) the value estimate is based on the perception of the customer which gains shall be obtained for a certain product and which sacrifices need to be invested in order for the product/service to be obtained and used [38]. Companies can create value in two basic ways: (1) by increasing the utility which customers shall gain and (2) by decreasing efforts and monetary expenditures of the customers [24]. In order to fully understand the process of value creation it is important to understand the difference between the different types of value created for the customer: (1) *the functional value* assumes the possibility of a product satisfying the customer needs in the most efficient manner, to be of the highest possible level of quality and that its procurement and usage needs as little effort and financial funds as necessary [11]; (2) *the social value* which is connected with reactions by other people in the surrounding of the customer and refers to the need of the customer to: (a) express the belonging to a certain group (in the sense of being accepted, not being rejected or creating a sense of personal identification with the group); (b) to connect with other members of the social community from their direct or indirect surroundings; (c) to point out to other members of the society some personal characteristic which is believed to be emphasized by a product or a service (for example, a material achievement) or personal life style [26]; (3) *the price value* is connected with the continuous intention of the customer to pay a lower price for products and services which are either bought through the discount price reductions, using coupons enabling discounts, the participation in loyalty programs or using marketing channels (for example m commerce) which enable product procurement at a lower price [2]; (4) *the epistemological value* is connected with the desire of the customers to experience something new or different which they have not encountered before, manifested

through their tendency to test different innovations by using a product or a service, novelties, as well as widening personal knowledge and perspectives [13]; *emotional or hedonic value* connected with good or bad customer feelings deriving as a result of using a certain product or a service and is created through the sense of excitement, fun and interest which some individual experiences while using a product or a service [3].

Creating customer value is effected by almost all company business processes, the activities within the distribution channels, the branding process, the development of good relationships with customers and company communication activities, by: (1) increasing different types of utilities for customers; (2) decreasing the customer sacrifice- minimizing time and efforts needed to be invested in order to gather information on a product and to procure the product, lower the procurement and product usage costs and minimize different types of risks (functional, financial, psychological and social) influencing the psychological pressure of the customer [25,12]. In further text of the paper, the main focus shall be on the brand influence onto the customer value creation which shall be analyzed through an empirical research of influence of its different dimensions.

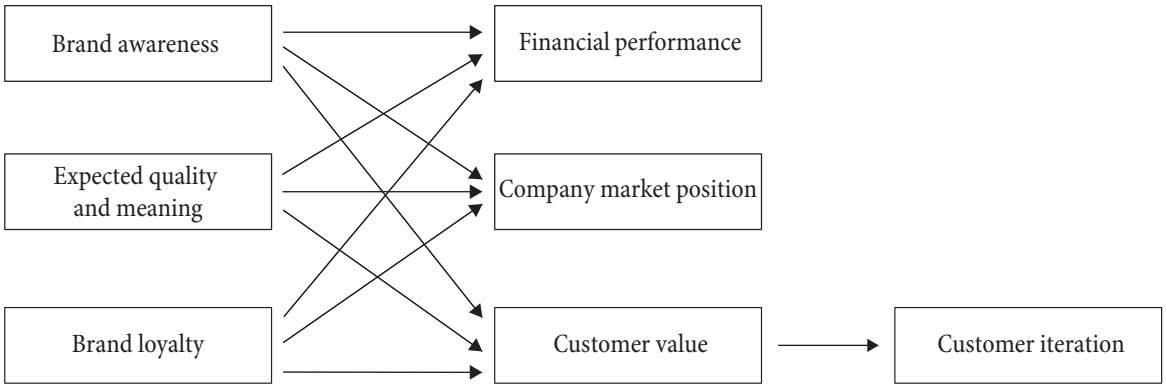
Brand dimensions and their influence onto the customer value creation

Branding is one of the basic priorities of company management during the recent years due to the fact that brand represents the most important part of the non-material asset value [20]. Brands significantly influence the final decision making while buying products which leads to the conclusion that they represent a significant source of value for the customers [33]. The brand analysis and their influence onto the decision making of customers regarding the alternative selection starts with the analysis of brand dimensions [19]. The basic brand dimensions have been shown within Figure 1.

The authors, which are the creators of the model shown within Figure 1, have identified the three basic brand dimensions, based on sublimed conclusions of wider research- brand awareness, brand loyalty and quality warrantee, which simultaneously influence the customer value creation and company financial performance [4]. All three brand dimensions have a strong influence via the created value onto the intention of the customer to buy products [17], which can be clearly seen from the model shown within Figure 1. If the degree of satisfaction after the delivered value is at a satisfactory level with the customers, an intention is developed to keep using the product and services of a certain brand, which has a significant influence onto the achieving the competitive market advantage [1].

Brand awareness is an important brand dimension which has several appearing shapes: (1) brand recognition by the customer; (2) feedback reaction of the customer concerning the brand; and (3) the awareness on characteristics and product/service performance belonging to a brand [22]. Keller defines brand awareness as the ability of the customer to recognize a brand in their surroundings or to be able to remember the brand when considering a certain product category which the brand products belong to [18]. Brand awareness is often connected to the ability

Figure 1. Three brand dimensions and their influence (according to Baldauf et al.)



of the customer to recognize different product or service characteristics which belong to a brand in the moment of usage or considering the products of another brand [36]. Brand awareness significantly diminishes risks and effort invested by the customers in the process of alternative selection which basically represents the main source of value created on its behalf for the customers as a brand dimension [6].

Expected quality and meaning is the second important brand dimension which influences the customer value creation. Brands by themselves are not generators on the shopping intention but it is rather their dimension which indicates that products have certain characteristics i.e. a certain level of quality [9]. Brands represent a unique guarantee that the product performance and/or services shall fulfill customer expectations [4]. This brand dimension is also defined as a function which gives confidence to the customer that the product has certain characteristics regarding the level of quality, functionality etc. [7]. This brand dimension significantly influences the needs of psychological character of the customer [19] and refers to the diminishing of efforts which customers must invest in the evaluation of different alternatives (for example, gathering information). The expected quality as a brand dimension influences the customer value creation in a manner that it represents products which have high social value [32]. The expected quality which is connected with the social value is especially important with luxurious products [34]. Luxurious products re defined as products which have a high price, superior quality, high hedonic value, superior design and are available to a relatively small number of customers [34]. Due to the high value of luxurious products the expected quality is a significant dimension which influences the customer value creation in a manner that the brand communicates a high social value in the direct or indirect customer surroundings.

Brand loyalty is the third significant brand dimension. Brand loyalty is defined as a consistent and permanent customer intention to re-buy and use the products of a certain brand in the future period independent from the influence of situation factors and marketing efforts of competitive companies which have the potential to influence the change of customer decisions [12]. Brand loyalty is a psychological intention which is based on their attitudes towards the brand and the intention to perform repeated purchases in the period to come [5]. Customers who develop brand loyalty increase the degree of brand connectedness and develop the habit of regular product purchases [28]. Customers who develop brand loyalty consider that the preferred brand is superior compared to others [35]. Brand loyalty has two components: *the behavior component,* which assumes that due to the created value based on developed loyalty customers choose product brands in the process of shopping and *the attitude component* which assumes the certainty of the customer (cognitive or affective) that the products of a certain brand are an alternative which has greater value compared to others which exist within the same product category [8]. Complete brand loyalty exists when both components are developed, i.e. when customers express retention intentions and have a developed belief that the brand is superior out of which derives their willingness to point out the product brand within the online or offline surroundings and recommend it to other potential customers [12].

Brand trust is the fourth brand dimension which affects the customer risk diminishing when considering weather he/she will get what is expected or not [10]. Brand trust as a dimension is not explicitly stated within the model shown on Figure 1, but is contained in three other dimensions. Based on the detailed review of modern literature, it can be noted that a great number of authors stresses brand trust as a separate brand dimension. Brand trust is a brand dimension based on which the customers gain certainty that the product has certain characteristics and quality [21]. Brand trust is a complex brand dimension which has three forms: (1) brand integrity which represents the customer trust in a brand based on which he/she takes into consideration the products when regarding the alternatives of a certain category and based on which derives the conclusion on different characteristics compared to other regarded options; (2) brand credibility which refers to the customer confidence that the products of a certain brand shall have the functional characteristics which can satisfy his/her precise need; (3) brand benevolence which is connected to the sense of customer security that the brand represents a guarantee that a company is

permanently dedicated to the quality maintenance and product reliability, as well as to have confidence in the brand in the period to come [31].

The methodology of the empirical study

The aim of the empirical research was to determine the importance of different brand dimensions for customers in Serbia and to draw a conclusion on the influence onto the created value based on that. Figure 2 represents a research model based on which the importance of every of the 4 brand dimensions for the customer is determined. The model contains the four basic variables (brand dimensions) whose influence is measured onto the value creation. Based on the measured attitudes on the importance of different brand dimensions conclusions have been drawn on their influence onto the created value.

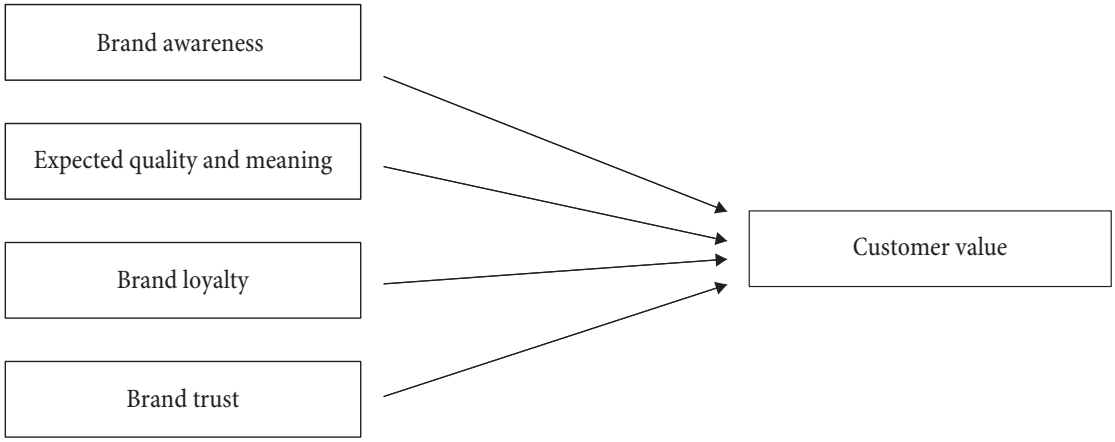
In order to determine the influence of the four dimensions of brand value creation onto the customers a questionnaire has been formulated containing five groups of questions: (1) questions on the demographic profile of the respondent; (2) questions regarding the determination of brand awareness importance; (3) questions determining the importance of expected quality and meaning; (4) questions regarding the determination of brand loyalty importance and (5) questions regarding the determination of brand trust importance. Questions which are used in the questionnaire have been taken from the research carried out by Sadek *et al.* [29]. Besides the first group of questions which refer to the demographic customer profile, for the rest of the questions a five-degree Likert scale has been used for the respondents to express their attitude. The Likert scale is the most appropriate measurement instrument for this kind of research [29].

The data have been collected during a two-week period. Data gathering has been performed on the territory of Belgrade, Niš and Novi Sad using an online questionnaire. The sample of respondents encompassed persons of different demographic profile. The total number of respondents was 212. The analysis of gathered data concluded that 174 questionnaires was valid and the results processing was performed only on those questionnaires. Out of the total number of responses from valid questionnaires, 37.9% were men and 62,1% women. The respondents aging from 18 to 45 accounted for 59.8% of the sample, while the respondents aging from 45 to 65 accounted for 40.2% of the sample. The respondents with higher education accounted for 62.2% of the sample, while the respondents with primary, secondary and higher education accounted for 37.8% of the sample.

The results of the study

After having collected the data via an online survey, it was checked weather four factors really existed or not and if they were significant for the customers. For that purpose, an exploratory factor analysis was used. In order to implement the factor analysis, it was needed to check weather certain preconditions for its fulfillment were satisfied for the justification of its usage. In order to confirm that the KMO (Kaiser-Meyer-Olkin) and Bartlett's test were used. The KMO test indicates how much the responses

Figure 2. The research model



are suitable for a factor analysis. The test measures the data convenience for every individual question within a questionnaire, as well as for the questionnaire, as a whole. The value of the test ranges from 0 to 1. If the value of the KMO test is greater than 0.8 the factor analysis can be accepted for the stated questionnaire, while if the value of the KMO test is lesser than 0.6, there is a need to perform certain corrections in order to further use the factor analysis. The result of the KMO test (0.948) indicates that there is an excellent convenience of the data from the given questionnaire to perform the factor analysis. The Bartlett's test of sphericity indicates the presence of correlation among stated questions (variables). The *null* hypothesis states that there is no statistically significant correlation, while the alternative hypothesis supports the attitude that there is. Weather the null hypothesis shall be rejected or not depends on the calculated R value of the given test. If the calculated R value of the test is greater than the critical value α, there are significant data to reject the null hypothesis, while if it is lesser, then there are no sufficient data to reject the null hypothesis. The critical value α represents the significance level under which the stated hypothesis is rejected or not. In order to perform this analysis, the critical value has been defined at the level of significance of 5% ($\alpha = 0.05$). The calculated R value of the Bartlett's test is 0.000. That value is less than the critical one ($0.000 < 0.05$), thus the null hypothesis can be rejected and conclusions can be drawn that there is a statistically significant correlation between the posed questions.

The confirmatory factor analysis has been used to check the model suitability. For that purpose, certain indices have been used and they are shown within Table 1.

Based on the obtained results shown within Table 1 it has been concluded that the model is suitable for further testing.

Having tested the model, an analysis has been carried out regarding the four dimensions of customer brand value. The results have been given within Table 2.

The standardized load given within Table 2 shows to what extent a certain factor (brand dimension) influences the regarded variable (customer value). The statistical significance of every factor influence has been confirmed ($r = 0.000$, $r < 0.05$). The *expected quality* has a positive influence on creating customer value. The growth of product quality of 1 standard deviation influences the value growth of 0.823 standard deviations. The second regarded dimension is *brand loyalty.* As is the case with the first variable, this one also has a statistically significant and extremely powerful positive influence. When it comes to brand loyalty, it is characteristic that a growth of 1 standard deviation implies a value growth of 1.005 standard deviations. The dimension *brand trust,* similar to the previous two, has a strong and positive influence onto the value (with statistical significance). The growth of influence of brand trust of 1 standard deviation, leads

Table 1: The confirmatory factor analysis of the original model suitability

The name of the index	The calculated index value	The critical index value
RMSEA	0.065	< 0.050 (excellent) < 0.080 (acceptable)
Normed Chi-square	1.738 r = 0.000	< 2.000 r > 0.050 (significance)
RMR	0.037	< 0.050 (excellent) < 0.100 (acceptable)
GFI	0.869	> 0.900 (excellent) > 0.800 (acceptable)
CFI	0.964	> 0.900
TLI	0.955	> 0.950 (excellent) > 0.900 (good)
NFI	0.919	> 0.950 (excellent) > 0.900 (good)

Table 2: The influence of factors (dimensions) onto the perceived value for the customers

Factor	Regression load	Significance	Standardized load
Expected quality	0.628	0.000	0.823
Brand loyalty	1.235	0.000	1.005
Brand trust	1.000	0.000	0.862
Brand awareness	1.185	0.000	0.967

to the value growth of 0.862 standard deviations. The last regarded dimension, the *brand awareness* also possesses a statistically significant influence onto the created value for the customers. This influence is very strong and if it grows for 1 standard deviation, it shall lead to value growth of 0.967 standard deviations. Based on the values from Table 2, it can be concluded that the greatest influence onto customer value creation is performed by the dimension customer brand loyalty.

Based on the obtained results of the empirical research and the confirmation that all four dimensions influence the value creation for the customers it has been tested weather there is a statistically significant difference in the respondents answers for every dimension depending on the gender of the respodent. Before selecting the appropriate test, it has been tested weather (derived) variables which account for the research dimensions have an adequate normal distribution. For that purpose, the Kolmogorov-Smirnov normality test has been used. The null hypothesis states that the regarded variable possesses normal distribution, while the alternative hypothesis states that it does not. The decision is made on the level of significance of 0.05. The results have been given within Table 3.

Based on the values from Table 3, it can be seen that for every dimension there are sufficient data to reject the null hypothesis, so therefore it is concluded that none of the dimensions has a normal distribution. Bearing in mind the obtained result a Mann-Whitney non-parametric test for the analysis of differences between two respondent samples has been used.

By using the Mann-Whitney test for every brand dimension it has been tested weather there is a statistically significant difference in grade depending on the gender of the respondent. For every testing the same hypotheses were applied. The null hypothesis states that there is no statistically significant difference in the average grade while the alternative hypothesis states that there is a statistically significant difference. Table 4 shows the ranks for all regarded categories according to the gender of the respondent.

Table 5 contains the values of the Mann-Whitney test with the adequate significance

Table 3: The Kolmogorov-Smirnov normality test

Dimension	Calculated value	Number of degrees of freedom	Significance	Null hypothesis
Customer brand loyalty	0.132	174	< 0.001	Rejected
Brand awareness	0.144	174	< 0.001	Rejected
Expected quality and meaning	0.178	174	< 0.001	Rejected
Brand trust	0.137	174	< 0.001	Rejected

Table 4: Average rank value for brand dimensions according to the gender of the respondent

Brand dimension	Gender	Average rank value
Customer brand loyalty	Female	84.27
	Male	92.78
Brand awareness	Female	89.06
	Male	84.95
Expected quality and meaning	Female	85.51
	Male	90.76
Brand trust	Female	81.25
	Male	97.73

Table 5: Mann-Whitney test for gender of the respondents

Dimension	Calculated test value (Z)	Significance	Null hypothesis
Customer brand loyalty	-1.086	0.277	Not rejected
Brand awareness	-0.527	0.598	Not rejected
Expected quality and meaning	-0.682	0.495	Not rejected
Brand trust	-2.114	0.035	Rejected

Based on the results within Table 5 the conclusion is that there are not enough evidence for the null hypothesis (non-existence of statistically significant difference between the regarded categories) to be rejected for the stated three brand dimensions. Only for the dimension brand trust there is a statistically significant difference in the answers from men and women. Regarding the values from Table 4, it can be concluded that men more statistically significant value the dimension brand trust compared to women (W= 81.25, M= 97.73).

Conclusion

The presented analysis has several important contributions. First, based on literature review, it can be concluded that customer value is one of the most important determinants of achieving competitive advantage onto the market. The brand is an important source of created value for customers and successful branding is one of the critical factors of success when it comes to achieving competitive advantage and improving the company financial performance.

Second, brand as an important element of created customer value is not a homogeneous category but there are rather four dimensions which influence the customer value creation- brand trust, brand awareness, expected quality and meaning and customer brand loyalty. Using an empirical research, a statistically significant influence of all four brand dimensions has been confirmed, noting that they do not have an equal influence onto the created customer value. Brand awareness and customer brand loyalty have a more significant influence onto the customer value creation compared to the other two dimensions, which is important to be taken into consideration in the process of branding. Within the branding process it is important to develop all four dimensions in order to maximize the created customer value.

Third, the empirical research has confirmed that the most important influence onto the customer value creation is posed by the dimension customer brand loyalty. Due to that reason, the branding process should not be implemented only through the communication strategy and brand positioning. It is important to improve the customer retention rate via the process of loyalty development and implementing the loyalty program. Developing brand loyalty increases the connectedness of the customer to the brand and significantly improves the created value. The loyalty as a continuous customer intention to use a certain brand during a longer period of time is prone to change, so therefore strengthening loyalty must be a continuous business process of every company.

Forth, there is no great difference in the influence of different brand dimensions onto the value creation to men and women as customers. The only noticed difference is that the brand trust as a brand dimension more significantly influences the value creation for men than for women. Due to that reason, during the branding process of "male products" and within campaigns which are more dominantly oriented towards men, it is important to develop brand trust, as a brand dimension, more than regularly.

The paper has several limitations which should be taken into consideration. The analysis is of general character and attention is not paid to differences which exist between different types of products. FMCG, luxurious products, products which are connected to a certain lifestyle, products which are bought as presents etc. basically differ. Directing the analysis of influence of different brand dimensions onto the created customer value with different types of products would enable obtaining more precise results and direct implications for marketing practice and theory. Also, the obtained results are limited to the customer analysis within the territory of Serbia and are connected for a specific time period. It would be important to territorially widen the research and to analyze the changes during a longer time period. This research has analyzed the difference in influence of different brand dimensions only between customers of different gender. The difference analysis between customers of different socio-demographic characteristics (gender, age, income, education etc.) would be more than significant and would significantly contribute to the marketing theory and practice.

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UNDERSTANDING ONLINE SHOPPING INTENTION OF GENERATION Z IN SERBIA

Uticaj životnog stila generacije Z na prihvatanje onlajn kupovine u Srbiji

Abstract

The development of information and communication technologies has influenced the lifestyle of consumers. Online shopping saves time and seemingly money, because it allows consumers to shop from home at any time 24/7/365. Today's consumers are online consumers, but the difference in generations indicates the need for consumers as such to be profiled and analyzed. The fact that 2020 is marked as the Corona year gives special importance to the analysis of online shopping intention. Measures to slow down the pandemic, among other things, were distancing, quarantine, isolation, so online shopping is becoming more convenient or the only possible option. The willingness of consumers to shop in a pandemic has accelerated the online shopping process in many countries and led to the creation of a new pattern of consumer behavior. The subject of this paper is Generation Z, which mostly follows the development of information and communication technologies. The aim of the research is to confirm the connection between the lifestyle of Generation Z, primarily students, as members of the dominant academic environment and online shopping. A well-structured questionnaire adopted from various previous studies was conducted through an online survey of 320 students across Serbia. Consumer lifestyle identification statements include activities, interests and opinions (AIO), where activities relate to a person's daily activities in terms of entertainment, leisure and shopping, interests relate to the importance a person has for fashion, food, recreation, media, and opinions focus on social issues, products, future, culture. The study uses a simple random sampling technique. The study performs a research factor analysis to isolate the factors that have emerged as bearers of consumer lifestyle characteristics.

Keywords: *Generation Z, lifestyle, online shopping*

Sažetak

Razvoj informaciono-komunikacionih tehnologija (IKT) uticao je na životni stil potrošača. Onlajn kupovina štedi vreme i naizgled novac, jer omogućava potrošačima da kupuju od kuće u bilo koje vreme 24/7/365. Današnji potrošači su onlajn potrošači, ali razlika u generacijama ukazuje na potrebu da se potrošači kao takvi profilišu i analiziraju. Činjenica da se 2020. godina obeležava kao korona godina daje poseban značaj analizi namere kupovine putem interneta. Mere za usporavanje pandemije, između ostalog, bile su distanciranje, karantin, izolacija, pa je onlajn kupovina postala sve zgodnija ili jedina moguća opcija. Spremnost potrošača da kupuju u pandemiji ubrzala je proces onlajn kupovine u mnogim zemljama i dovela do stvaranja novog obrasca ponašanja potrošača. Predmet ovog rada je generacija Z, koja najvećimdelom prati razvoj informaciono-komunikacionih tehnologija. Cilj istraživanja je da se potvrdi povezanost životnog stila generacije Z, pre svega studenata, kao pripadnika dominantnog akademskog okruženja i onlajn kupovine. Dobro struktuiran upitnik usvojen iz različitih prethodnih studija sproveden je kroz onlajn anketu od 296 studenata širom Srbije. Izjave o identifikaciji životnog stila potrošača uključuju aktivnosti, interesovanja i mišljenja (AIO), gde se aktivnosti odnose na svakodnevne aktivnosti osobe u smislu zabave, slobodnog vremena i kupovine, interesovanja se odnose na značaj koji za osobu ima moda, hrana, rekreacija, mediji,a mišljenja se fokusiraju na društvena pitanja, proizvode, budućnost, kulturu. Studija koristi jednostavnu tehniku slučajnog uzorkovanja. Studija vrši analizu faktora istraživanja kako bi se izolovali faktori koji su se pojavili kao nosioci karakteristika životnog stila potrošača.

Ključne reči: *generacija Z, životni stil, onlajn kupovina*

Introduction

According to the data of the Statistical Office of the Republic of Serbia, 81.5% of households in Serbia have an Internet connection [52]. Only 10% of the population claim to have never used the internet. The development of information and communication technologies facilitates everyday life and communication, changing the way and pattern of life that affects the use and purchase of products. Understanding the lifestyle of consumers is crucial to creating an adequate marketing strategy.

Demographic characteristics and personality of consumers influence the creation of consumer purchasing intentions. If we look at the buying process through five basic stages that the consumer goes through - problem identification, information retrieval, evaluation of alternatives, shopping and post-purchase behavior [27] and if it is clear that in online shopping consumers buy from retailers directly without intermediaries then the analysis of consumer purchasing intentions is a bound predictor of actual consumer behavior in online shopping [34]. If we look at the intention through the consumer's plan to perform an online transaction in a certain period of time [38], it is important that companies recognize the characteristics of target consumers and create an effective personalized communication message that will encourage them to buy. However, consumers with different characteristics may react differently to online shopping. Understanding the factors that affect online shopping is not an easy task and even though the leaders in online shopping are younger people, it does not mean that older customers are not online consumers and do not react to the messages that companies place on them.

Generation Z is the generation born after 1995, which is also called the i-generation, the post-millennium generation, the technology generation and the online generation. They are between 19 and 34 years old and are characterized by a digitally oriented lifestyle. Generation Z adapts well to both the real and virtual worlds, complementing each other easily, resulting in them easily finding, researching and sharing the information they need, using a variety of communication devices and channels. This generation is an active user of social media with many contacts, with daily communication through social media [13]. Generation Z embodies its opinions and attitudes using Twitter, blogs and internet forums and likes to share photos (Instagram, Pinterest, Snapchat) and movies (YouTube, Instagram, Snapchat). Generation Z is not just user of Internet content, but also creates and controls it[22]. Understanding the Generation Z lifestyle is essential for all companies interested in designing appropriate communications for this consumer group.

Who is Generation Z?

The need to profile consumers has created a theory of generations X, Y, and Z [58]. Generational profiles are created according to the demographic group of consumers that is associated with the year of birth and different lifestyles. Generation X consists of consumers born before 1980 and is also called the baby boomer generation. Generation Y consists of consumers born between 1980 and 1995 and is called the Millennium Generation. Generation Z consists of consumers born after 1995 and is also called the i-generation or postmillennial generation - true digital natives. It is clear that young people have different priorities compared to the older generations, they generally have no financial obligations, so they spend over 70% of their income on entertainment, travel and food. However, age is not the only factor that characterizes a certain generation, otherwise the behavior of teenagers today would not be differentiated by generations. Marketing professionals need to identify consumer behavior in each generation and create their STP strategy accordingly (segmentation, targeting, positioning). Differences in each generation bring significant differences in the segmentation of consumer behavior, where the change of generation implies significant implications, especially in marketing.

Generation Y is characterized by individuality in terms of decision making, they are educated and care about general social attitudes. They use electronic media (television and the Internet), and most respond to advertisements based on billboards and social networks [54].Generation Z has similarities to Generation Y, but spends significantly more time in cyberspace. They follow

trends related to digital technologies and communications, and show a high dependence on smartphones [6]. They are more imaginative, confident, optimistic, born in the era of internet technology, focused on innovation, almost always online. They are informed and greatly influence family consumption [29]. Companies have to communicate with this generation in the online space, through social networks, applications. It must be clear to companies that as their purchasing power grow, so does the effectiveness of the marketing message that was built in communicating with them [44], [20]. Understanding the lifestyle of Generation Z, we gain valuable information in various areas of socio-economic life. According to Forrester Research, Generation Z spends more time online, almost 3.9 hours a week watching shows online, compared to adults in the United States who spend only 1.6 hours a week [45].

Generation Z has yet to be fully defined. They are accustomed to the daily use of high technology and multiple sources of information, with messages bombarding them from all sides. They are influenced by new media, virtual friends and the power that comes with technology. Interestingly, in the U.S., 24% of 12-18 year olds use different media most of the time while watching TV. This current approach to the world via the Web has fostered respect for knowledge - 83 percent of children aged 8 to 12 say, "It's nice to be smart". However, the accelerated pace of cyber speech shortened the range of attention and increased their awareness of visual elements. Generation Z is made up of new independent thinkers looking for answers in all areas of life. Today's teenagers are the first generation to practice the independence of adolescents on the Internet, that is, teenagers do not need parents or teachers to help them gather information. They can visualize a change of place with someone else and project possible behaviors. They are confident and have developed incredible optimism. Generation Z is also characterized by considerable marketing intelligence. Accepting peers is very important for Generation Z. The key feature is the need to belong. Music, fashion, cosmetics and video games are important in terms of accepting and fitting peers. Influence is common in areas of style, including hairstyles and wardrobe choices. Amazingly, children are able to recognize brands from about 18 months. Children love to hear or see other children doing things. Puberty for this generation begins earlier than ever. She is a ten-year-old who dresses as if she has just celebrated her sixteenth birthday. He is a fearless and untouchable teenager, but he is afraid to enter the basement when it gets dark.

Lifestyle segmentation

Lifestyle is a pattern in which people spend time and money on certain activities [18]. Many researchers point to the importance of analyzing lifestyle characteristics in customer behavior when shopping. Bellman et al. [3] in their analysis claim that online consumers have been online for years, that they use the Internet as a routine means of receiving and sending e-mails, doing their job, reading news, searching, and using it as routine use, as a shopping channel. Lifestyle of consumers directly and indirectly affects the behavior of online consumers in online shopping. From an economic perspective, consumer lifestyle refers to the way individuals distribute their income, both in terms of relative allocation for different products and services and in terms of specific choices within this group.

The concept of lifestyle in marketing was first introduced by William Lazer [30], who defines lifestyle as a typical pattern of personal and social characteristics of behavior of individuals or groups, which in practice refers to people's way of life and spending their time and money[26]. Psychographic analysis is the main instrument used to measure the lifestyle of consumers [36], [57]. Marketing theorists agree that the role of psychological variables in the study of consumers is unavoidable [46].

Consumer lifestyles are specific patterns of behavior that stem from the intrinsic values of those individuals that stem from an individual's lifestyle [24]. One's lifestyle is a function of inherent individual characteristics that are shaped through the social interaction of the individual life cycle [50]. Consumer lifestyle is the way they live, what products they buy, how they spend, what they think and how they feel about them. Understanding and predicting consumer behavior is a vital aspect of marketing, the basis of all marketing activities. Over the

past few decades, the emphasis has been on demography and social characteristics, although Plummer [43] states that demographic data are insufficient and need to be supplemented with other data. In this regard, Plummer [43]points out that lifestyle research is one of the most important activities in marketing. Donthu and Garcia [17] point to the fact that many factors help the development of online commerce, many are related to technological progress, but among the most important that do not relate to technological progress certainly relate to the lifestyle of consumers.

Lifestyle describes how a person behaves in interaction with his environment. Lifestyle measures human activities based on individual patterns of spending time, interests, but also according to basic characteristics such as income, education and residence. In predicting consumer behavior, experts argue that individual lifestyles determine individual consumer behavior to the best of their ability. If we say that an individual's lifestyle is a set of motivated behaviors that develop in interaction with the environment, living conditions and acquired knowledge and beliefs, then from a sociological point of view we can say that an individual's lifestyle is motivated by external stimuli, and psychologically suggests that inner trust drives a lifestyle. The AIO concept considers lifestyle as a series of behaviors that reflect individual psychological considerations and sociological consequences, which is why it was used in the analysis. Based on a review of the lifestyle literature, analysts generally agree that human behavior can be predicted and explained by the function of psychological and sociological variables, which create an individual's lifestyles.

Psychographic analysis is the main instrument that quantifies the lifestyle of consumers [36]. The concept of lifestyle is more comprehensive than demographic and socio-economic characteristics [49], [5] and in individuals, lifestyle is a stronger predictor of behavior. Lifestyle segmentation implies that people are divided into groups according to the way they spend their time, the importance of the things around them, their beliefs and socio-economic characteristics[23]. Therefore, companies need to understand the lifestyle of consumers in the local market in order to create a marketing strategy.

According to Swinyard and Smith[53], online consumers are younger, wealthier, more educated, have greater computer literacy, spend more time on the computer, spend more time online, easily make online purchases and are less afraid of financial losses resulting from online transactions. In their research, they emphasize the importance of computer literacy and how much knowledge about the use of the Internet allows them to be more productive and efficient. The analysis of Generation Z comes from the need to analyze consumers who already have general ICT knowledge, in order to create the most efficient marketing strategy in complex market conditions.

Online shopping

Online shopping is the process by which consumers buy goods or services directly from the seller in real time, without an intermediary role, over the Internet [16]. Through online transactions, online consumers create value for companies in ways that need to be considered in order to understand the potential of online consumers [28]. Currently, e-commerce contributes from 5% to 9% of total gross domestic product in developed countries, and in emerging markets it increases by 15% to 25% each year. InternetWorldStats [25] reported that 62% of the world's population uses the Internet, and that number is increasing every day (in 1995 this percentage was 0.4, in 2000 5.8% of the world's population, in 2005 15.7%, and in 2015 46.4%). The world of online buying and selling is evolving at an astonishing rate. According to Statista [51], global online sales will increase to 4.135 billion dollars in 2020 [1]. The number of online shoppers is growing rapidly as the level of users who adopt and use all online shopping activities increases [12], [21].

Online shopping is the fastest growing field of e-commerce. Online shopping has certainly gained in importance with the growth of e-commerce, since 1990 when the global retail sector revolutionized [8]. With the advancement of technology, online consumers not only shop, but gain knowledge about products, compare brands, evaluate quality, gather price information in different locations and due to many other benefits that the online experience provides consumers, they become

more powerful and demanding in making purchasing decisions.

In recent years, there have been profound changes in the lifestyle of consumers, and not only because of the great expansion of the Internet. An increasing number of people are time-bound by obligations towards work and family. People today live in an era of rather hectic and busy working lifestyles and therefore it has become very difficult for most people to go shopping outside their homes.

Online shopping can also be found in the literature under the term online shopping, e-shopping, online shopping, and can be briefly defined as the process of buying goods and services online. Online shopping involves researching, searching, browsing or viewing products for more information with the possible intention of shopping online. According to Chiu et al. [9], online shopping can be considered an exchange of time, effort and money to receive products or services. In recent years, shopping online has become the norm and consumers around the world like to shop online, because it has many advantages. From the consumer's point of view, online shopping has eliminated traditional shopping inconveniences such as crowds, standing in long lines for payment and fighting for parking spaces in a busy location or mall. Rowley [47] states that customers can compare available products and their prices from different outlets online, without spending a lot of time but also money. In addition, online shopping allows consumers to enjoy the privacy of their home. On the business side, the Internet has significantly changed the way retailers represent, advertise, sell and communicate with consumers. Moreover, it offers retailers a global market that extends far beyond the traditional geographic markets served by their physical stores. According to a 2008 Nielsen Global Online Survey on Internet shopping habits [41], more than 85 percent of the world's online population made online purchases, up 40 percent from the 2006 market. Despite the tremendous growth and optimistic prospects of online shopping, there are still consumers who intend to buy online, but for some reason do not. Cho [10] points to the fact that almost 95 percent of Internet users visit retail sites, but that most of them do so without the intention of actually making a transaction. More importantly, it is estimated that 98.7 percent of those who visit websites do not return, even if a purchase is made. Moreover, Lewell[33] states that according to research conducted by Engage Technologies and the British internet consulting company UK Internet consultancy Nvision, four out of five web users never return to a page. It is undeniable that online shopping makes it easier for customers to shop, but also provides them with an unlimited level of information, where the current comparison of prices and services 24/7 raises concerns for online retailers, especially in retaining online consumers. These traders are just a click away from their competitors which is a major threat to maintaining revenue, profitability and market success [4].

Research results

In this study 296 respondents participated in the study, young people members of Generation Z with an average age of 23.58 years, of which 63 (21.3%) were male respondents and 233 (78.7%) were female respondents. None of the respondents voted for the rest, as far as gender is concerned. Regarding the region of birth of the respondents, 67.9% were born on the territory of the City of Belgrade, 14.9% in Vojvodina, 2.7% in the Former Yugoslav Republic and 14.5% in some other location.

In relation to the place of residence, the largest number of respondents live in the territory of the City of Belgrade 70.3%, in Vojvodina 16.6%, in the territories of the former Yugoslav republics 0.7% and 12.5% live in another destination. Looking at the place of living related to the urban areas, 49.3% live in the inner city, 29.7% live in the wider city center, while 20.9% of respondents live in rural areas. In Table 5 we can see that the most common financial position of the respondents is mostly good (45.6%), then mediocre (41.6%), very good financial position has 9.8% while mostly bad and very bad financial position has 3% respondents.

Observing the personal/family material position in relation to the urbanity of the environment, the Chi-square Independence Test did not show a significant relationship, $\chi 2$ (12, n=296)=9.246, p = 0.322, phi = 0.177. The Chi-square Independence Test showed a significant relationship between variable personal/family financial

status and region of living, $\chi 2(12, n=296)=84.275$, $p=0.000$, *phi*=0.534. As R-1 = 3 (four categories) Cramer's V is 0.308, so we say that the impact is great [19].

Activities

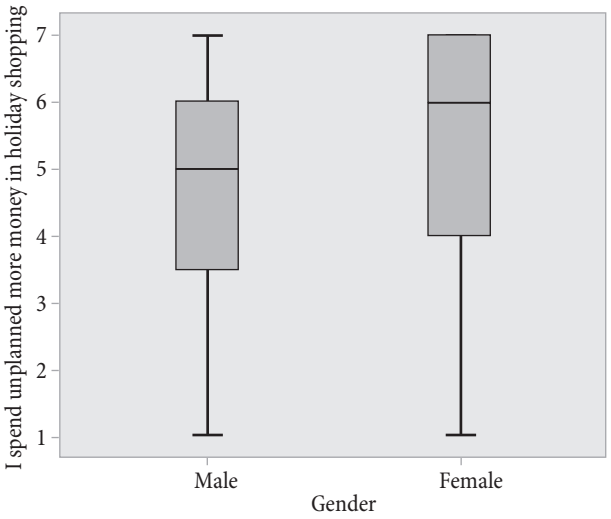
Looking at the variables from the group Activities - Work, all observed variables: I love my job/core business (e.g. studies if you study, etc.), It is important for me to work on jobs where I can highlight my creativity, I have ambitions to advance in the company/institution where I work, I manage to perform the assigned activities within the prescribed time, It is important to me to do my job well/ quality and I manage to balance free time and obligations/ work I do have an average grade of 6.1 or higher, show strong negative asymmetry (Skewness are less than -1.5), and the data are homogeneous for all observed variables, i.e. the coefficients of variation are about 14%. Each of the variables has outlay data. None of the variables has a normal schedule (all Sig. P_value for the Kolmogorov-Smirnov test are less than 0.05).The Mann-Whitney U test did not reveal a significant difference for any of the observed variables between men and women (all Asymp. Sig. (2-tailed) values are greater than 0.05).Kruskal Wallis Test found a statistically significant difference for It is important for me to work on jobs where I can highlight my creativity in three different groups of urban urbanity (Asymp. Sig. P_value is 0.021), where the group has the highest mean rank respondents whose living in the Already metropolitan area.Kruskal Wallis Test revealed a statistically significant difference for I love my job/core business (e.g. studies if you study, etc.), It is important for me to work on jobs where I can highlight my creativity, I manage to complete assigned activities on time, I succeed to balance free time and obligations/work I do, in five different groups of material position of respondents (Asymp. Sig. p_value are 0.042, 0.008, 0.020, 0.041), where the highest average value of rank (Mean Rank) has a group of respondents whose financial position Very good.

Variables from the subgroup Activities - Hobbies, free time (I have enough free time, I try to organize my free time well, I like to spend free time at home, I have a hobby that I do in my free time, I enjoy my free time, Free time is worth extra money, I watch less TV because of the internet) do not have a normal schedule (all Sig. p_ value for Kolmogorov-Smirnov test are less than 0.05), average grades are equal to or greater than 5.09, median is for all variables 6 (50%) respondents give a grade of 6 or less), except for the variable I like to spend my free time at home. All variables show a strong negative asymmetry (Skewness is less than -1), and the data are homogeneous for all observed variables (coefficients of variation are less than 30%), except for the variable I have a hobby in my spare time (coefficient of variation is 35%). This variable is the only one in the subgroup that does not have outlayer data.The Mann-Whitney U test did not reveal a significant difference for any of the observed variables between men and women (all Asymp. Sig. (2-tailed) values are greater than 0.05).The Kruskal Wallis Test did not reveal a statistically significant difference for any of the observed variables in the three different groups of urban urbanity (Asymp. Sig. P_value are greater than 0.05).

Variables from the subgroup Activities - Holidays and social events (I like to attend social events, For the holidays I relax and enjoy spending time with family and friends, I like to travel during the holidays, I like to go on holiday shopping, I plan a budget for holiday shopping, I spend unplanned more money in holiday shopping) do not have a normal schedule. All variables have an average rating of 5.23 or higher, except for the variable I plan a budget for holiday shopping which has an average rating of 4.98 and a coefficient of variation of 37.69%. All variables have a median of 6, except the variable for the holidays I rest and enjoy spending time with family and friends whose median is 7 and the minimum value is 5. Variables I like to go on holiday shopping they have no outlay data. All variables show a strong negative asymmetry. When asked about unplanned higher spending of money in holiday shopping (see Figure 1), there was a statistically significant difference in the gender of respondents Male (Me=5.0, n=63) or Female (Me=6.0, n=233), U=5,565.00, z=- 1.693, p=0.002, magnitude of impact $r = \frac{z}{\sqrt{N}} = \frac{1,693}{17,20} = 0.10$, i.e. we can say that the impact is small Cohen [11]. Female respondents have a higher Mean Rank.

Variables from the subgroup Activities - Entertainment (I prefer to sit at home than to go out / I am a "home type",

Figure 1: Spending money during the holidays in relation to gender



Source: Author (2022), results of primary research

I like to go to parties with a lot of people where loud music is played, I like to organize parties and dinners in my home, I like to I spend money on outings) don't have a normal schedule. I like to go to parties with a lot of people where loud music is played, which is expected, considering the age group of respondents, while other variables have an average grade of around 4.5 and a median 4 or 5. Variable I prefer to sit at home than to go out/I am "home type" shows a small negative asymmetry, while other variables show a medium negative asymmetry. All variables have a coefficient of variation greater than 30%.The Mann-Whitney U test did not reveal a significant difference for any of the observed variables between men and women (all Asymp. Sig. (2-tailed) values are greater than 0.05).

Variables from the subgroup Activities - Club membership (I accept loyalty cards, I use the benefits of shopping that offer loyalty cards for online shopping) do not have a normal distribution, average scores are almost identical 5.08 and 5.03, median is 6, while the coefficients of variation greater than 30%, and variables show strong negative asymmetry.On the question of loyalty cards, there was a statistically significant difference in the sex of the male (Me=5.0, n=63) or Female (Me=6.0, n=233), U=6,051.50, z=-2.238, p=0.025, magnitude of the impact $r = \frac{z}{\sqrt{N}} = \frac{2,238}{17,20} = 0.13$ i.e. we can say that the impact is small Cohen [11]. Female respondents have a higher Mean Rank. Use of shopping benefits offered by loyalty cards and for online shopping, there was a statistically significant difference in the gender of the respondents Male (Me=5.0, n=63) or Female (Me=6.0, n=233), U 6,089.50, z=-2.119, p=0.034, magnitude of impact $r = \frac{z}{\sqrt{N}} = \frac{2,119}{17,20} = 0.12$, i.e. we can say that the impact is small Cohen [11].

Variables from the subgroup Activities - Community (I spend a lot of time talking to friends about products and brands, Among the first in society to try new products and brands, Friends often come to consult with me about shopping, I buy online if friends recommend, On social networks regularly I follow announcements about products and brands) do not have a normal schedule. The variable has the highest average score of 5.15. On social networks, I regularly follow announcements about products and brands, with a median of 6 and a strong negative asymmetry. Other variables have an average score between 4.25 and 4.81, a median of 5, except for the variable Among the first in society I try new products and brands that have a median of 4 and a slight negative asymmetry. None of the observed variables has outlay data.To follow the announcements on social networks about new products and brands, there was a statistically significant difference in the gender of the respondents Male (Me=5.0, n=63) or Female (Me=6.0, n=233), U=5,834.00, z=-2.556, p=0.011, magnitude of impact $r = \frac{z}{\sqrt{N}} = \frac{2,556}{17,20} = 0.15$, i.e. we can say that the impact is small Cohen[11]. For none of the observed variables, there was no significant difference in relation to material position (all Asymp. Sig. P_value for Kruskal Wallis Test are greater than 0.05).

Variables from the subgroup Activities - Shopping (I like to buy smart - I get more value for price), Online shopping is a new, fun way to shop, Online shopping is easier than going to traditional stores, I like to search online stores, Online shopping offers lower prices than those in traditional stores, I enjoy online shopping, I think online shopping offers a better choice than traditional stores, I don't know much about the possibilities offered by the Internet, Online shopping scares me, I buy online more than before, Online shopping we avoid problems with local stores) do not have a normal schedule. All variables have an average rating of 5.16 to 6.19, except for the variables I think online shopping offers a better choice than traditional stores with an average rating of 4.73 and a median of 5, I

buy online more than before 4.60 and a median of 5, and variables Online shopping scares me 3.48 and median 3. These three variables show a slight negative asymmetry. Variables I like to buy smart - I get higher value in terms of price/quality and I like to search online stores have outlay data, while other variables do not.

In Figure 2 for the variable I like to buy smart, we can see that the minimum value is 5, and that the variation interval is 1 (Q3-Q1).The results are not unexpected given that young people spend much of their time online and on social media.For smart shopping, obtaining higher value in relation to price/quality, there was a statistically significant difference in the gender of the respondents Male (Me=6.0, n=63) or Female (Me=7.0, n=233), U=5,909.00, z=-2.583, p=0.010, magnitude of impact $r = \frac{z}{\sqrt{N}} = \frac{2,583}{17,20} = 0.15$, i.e. we can say that the impact is small Cohen (1988). The Kruskal Wallis Test found a statistically significant difference for Online Shopping is a new, fun way to shop in five different material position groups (Asymp. Sig. P_ value is 0.042), with the highest Mean Rank having a group of respondents whose financial position is Very Good.We can also see that among the volatile online shopping is a new, fun way of shopping and online shopping is easier than going to traditional stores, I like to search online stores and enjoy online shopping, as well as among I enjoy online shopping and I think online shopping offers better choice of traditional stores there are significant linear connections (r=0.673, r=0.689 and r=0.675), while among the variables Online shopping is a new, fun way of shopping and I enjoy online shopping there is a strong linear connection (r=0.750).

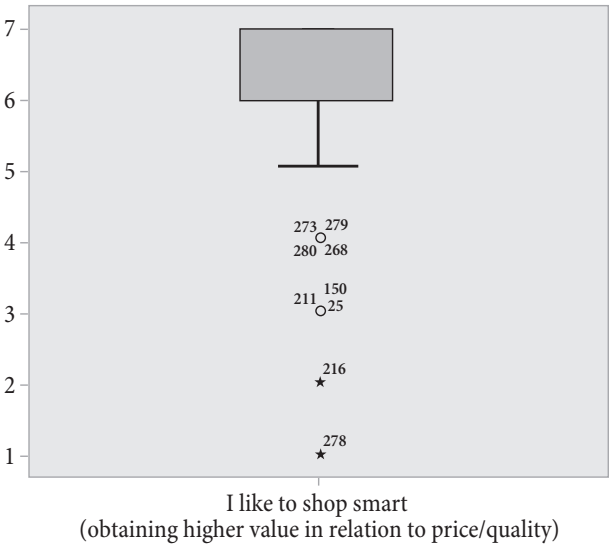
Variables from the subgroup Activities (Sports) What was expected, for all observed variables Man-Whitney U test revealed differences for men and women (all Asymp. Sig. (2-tailed) p_value are less than 0.05, i.e. are respectively 0.005, 0.001, 0.006, 0.000, 0.001), where the variables are on average higher (higher Mean Rank) for male respondents

Interests

Variables from the subgroup Interests - Family (I spend my free time entirely with my family, I am directly involved in spending the household budget, I like to go shopping with my family). The observed variables have average scores of 5.50, 5.49 and 5.56. The medians for all variables are 6, and the variables show a strong negative asymmetry (see Figure 3). Only variable I like to go shopping with my family has outlay data.For going shopping with the family, there was a statistically significant difference in relation to the sex of the respondents Male (Me=5.0, n=63) or Female (Me=6.0, n=233), U=5,283.00, z=-3.548, p=0.000, magnitude of impact $r = \frac{z}{\sqrt{N}} = \frac{3,548}{17,20} = 0.21$, i.e. we can say that the influence is middle Cohen [11].

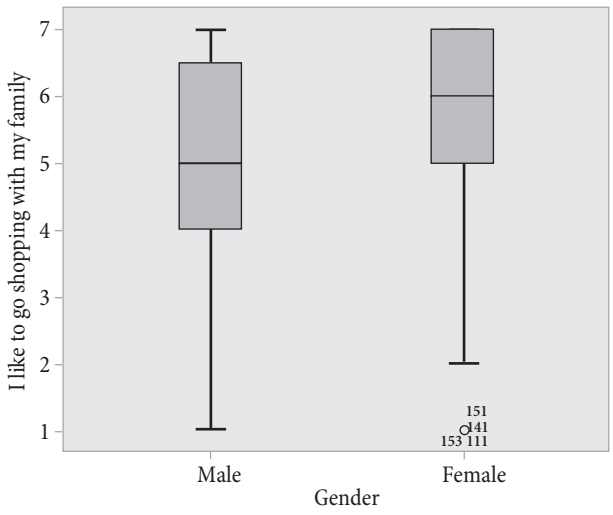
Variables from the subgroup Interests - Home (I wish I didn't have to leave the house when I buy, I find

Figure 2: I like to shop smart



Source: Author (2022), results of primary research

Figure 3: I like to go shopping with my family in relation to gender



Source: Author (2022), results of primary research

out about prices online to save home budget, I like to have products delivered to my home address, I don't spend more than necessary to bought certain products (even if I don't buy the best brand), I like to try products I see online (on social networks) they don't have a normal schedule. All observed variables show a medium negative asymmetry, except for the variable I would like not to have to leave the house when shopping for which we can say that there is no asymmetry, which has a median of 4, while all other variables have a median of 5.04, 5.01, 4.89, 4.96 and 4.65. The Man-Whitney U test did not reveal a significant difference for any of the variables for men and women (all Asymp. Sig. (2-tailed) p_value are greater than 0.05, and are 0.666, 0.159, 0.935, 0.439 and 0.459).The Kruskal Wallis Test did not reveal a significant difference for any of the observed variables for the three different environmental groups in which the respondents live (all Asymp. Sig. P_ value are greater than 0.05, and are 0.756, 0.427, 0.612, 0.569, 0.083).

Variables from the subgroup Interests - Work (I do work carefully to make sure it is well done, I am ready to spend more time to do a good job, I am creative in doing my job, I like to I have obligations that will use my time productively, because of the work I do, it is easier for me to buy online) they do not have a normal schedule. All observed variables show very strong negative asymmetry and have average averages of 6.54, 6.26, 6.16, 6.23 with a median of 7, and coefficients of variation of less than 20%, except for the variable Because of the work I do it is easier for me to buy online which has an average score of 4.53 with a median of 4, weak negative asymmetry and a coefficient of variation of 44.81%. All variables, except the variable Because of the work I do, it is easier for me to buy online, they have outlay data.Man-Whitney's U test did not reveal a significant difference for any of the variables for men and women (all Asymp. Sig. (2-tailed) p_value are greater than 0.05, and are 0.118, 0.553, 0.842, 0.439 and 0.459).The Kruskal Wallis Test did not reveal a statistically significant difference for any of the observed variables in the three different groups of urban urbanity (Asymp. Sig. P_value are greater than 0.05).

Variables from the subgroup Interests - Food (I watch how I eat, I choose foods carefully, I buy foods of organic origin, I buy foods with low calories, I use diet products at least once a week, I buy groceries every day in the store, I buy groceries online). Average grades are 4.80, 5.00, 4.03, 4.14, 3.93, 5.92 and 2.49, medians 5, 5, 4, 4, 4, 6 and 1, which means that 50% of respondents for the variable I buy food online gives a score of 1. This variable has a pronounced positive asymmetry, other variables have a pronounced negative asymmetry, except for variables I buy foods of organic origin, I buy foods with low calories, I use diet products at least once a week.

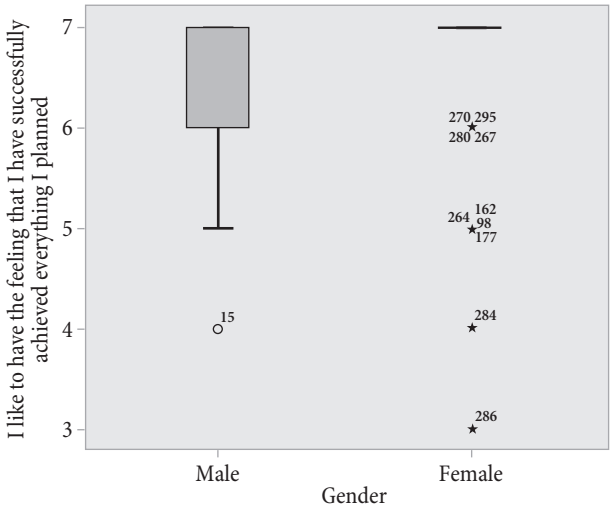
The Mann-Whitney U test did not reveal a significant difference for any of the variables for men and women (all all Asymp. Sig. (2-tailed) p_value are greater than 0.05, and are 0.962, 0.895, 0.272, 0.799, 0.232, 0.209 and 0.540). The Kruskal Wallis Test found a statistically significant difference for: I watch how I eat, I choose foods carefully and I use diet products at least once a week in three different groups of urban urbanity (Asymp. Sig. P_value are 0.010, 0.018 and 0.022), where the highest mean Mean Rank for all variables has a group of respondents whose place of residence is the metropolitan area.

Variables from the subgroup Interests - Media (I trust the information I read on the Internet, I read the news every day, I enjoy renting/buying favorite movies for delayed viewing, I enjoy listening to the radio, I like to follow news online actively and up to date during the day, those things that interest me, I am informed about products and events that are not only related to my work and family) do not have a normal schedule. Average grades of variables are 3.38, 3.89, 3.29, 5.04, 4.05, 5.79 and 5.60, medians 4, 4, 3, 6, 4, 6 and 6. Variables I enjoy listening to the radio, I am informed online about those things that interest me, I am informed about products and events that are not only related to my work and family show strong negative asymmetry, changeable I like to follow news online actively and azure during the day medium negative asymmetry, variable I trust the information I read on the internet and I enjoy renting/buying my favorite movies for delayed viewing medium positive asymmetry, while the variable I read news daily has no asymmetry. Just questionable I find out about products and events that are not just related to my job and family has outlay data.For listening to the radio, there was a

statistically significant difference in relation to the sex of the respondents Male (Me=4.0, n=63) or Female (Me=6.0, n=233), U=4,675.00, z= 4.520, p=0,000, size impact $r = \frac{z}{\sqrt{N}} = \frac{4,520}{17,20} = 0.26$, i.e. we can say that the influence is middle Cohen [11].Among the variables I believe in the information I read on the Internet and I read the news every day, I inform myself online about those things that interest me and I inform myself about products and events that are not only related to my work and family, there are significant linear connections (r=0.592 and r=0.669).

Variables from the subgroup Interests - Achievements (I am proud to use things I have done, I like to feel that I have successfully achieved everything I planned, I like to do things my way, I like to feel excited to do new things) do not have a normal schedule (see Figure 4). The average scores are 6.59, 6.67, 6.53 and 6.47, the median is 7. All variables have a strong negative asymmetry, and the coefficients of variation are less than 12.13%.Regarding the pride after the done and later used, there was a statistically significant difference in relation to the sex of the respondents Male (Me=7.0, n=63) or Female (Me=7.0, n=233), U=6,241.00, z=-2.209, p=0.027, magnitude of impact $r = \frac{z}{\sqrt{N}} = \frac{2,209}{17,20} = 0.13$ t, i.e. we can say that the impact is small Cohen [11]. When it comes to the feeling of success for all that was planned, there was a statistically significant difference in relation to the sex of

Figure 4: I like to have the feeling that I have successfully achieved everything I planned in relation to gender



Source: Author (2022), results of primary research

the respondents Male (Me=7.0, n=63) or Female (Me=7.0, n=233), U=6,616.00, z=-2.845, p=0.004, magnitude of impact $r = \frac{z}{\sqrt{N}} = \frac{2,845}{17,20} = 0.17$, i.e. we can say that the impact is small Cohen[11]. In both cases, female respondents have a higher Mean rank.

Opinion

Variables from the subgroup Opinion - About myself (I am more independent than most people, I am satisfied with how I cope with everyday life activities, I experience myself as a young and energetic person, I think I have more self-confidence than other people, I never rush myself, I like to I spend time with positive people who enjoy life) do not have a normal schedule. All variables show strong negative asymmetry, average scores are 5.73, 6.00, 6.17, 5.17, 5.02 and 6.65, medians 6, 6, 6, 6, 5 and 7. All variables have coefficient of variation less than 20%, except for the variable I never rush myself who has a coefficient of variation of 33.86%.Regarding independence from other people, there was a statistically significant difference in the sex of men (Me=6.0, n=63) or Female (Me=6.0, n=233), U=5,496.00, z=-3.234, p=0.001, magnitude of impact $r = \frac{z}{\sqrt{N}} = \frac{3,234}{17,20} = 0.19$, i.e. we can say that the impact is small Cohen [11]. The Kruskal Wallis Test found a statistically significant difference for: I am more independent than most people and I think I have more self-confidence than other people in three different groups of urban urbanity (Asymp. Sig. P_value is 0.012 and 0.003), where the highest mean rank (Mean Rank) for both variables has a group of respondents whose place of residence is the Already metropolitan area.

Variables from the subgroup Opinion - Social Issues (Environmental issues are important, I like to volunteer, I like to work on projects related to improving the community in which I live) do not have a normal schedule. The average scores are 6.41, 5.02 and 5.37, the medians are 7, 5 and 6. All variables have a coefficient of variation of less than 30% and show a strong negative asymmetry. Only Variable Environmental Issues Matter Have Outlay Data.On the importance of the environment, there was a statistically significant difference in relation to the sex of the respondents Male (Me=6.0, n=63) or

Female (Me=7.0, n=233), U=5,750.50, z=-3.013, p=0.003, magnitude of the impact $r = \frac{z}{\sqrt{N}} = \frac{3,013}{17,20} = 0.18$, i.e. we can say that the impact is small Cohen [11]. The Kruskal Wallis Test found a statistically significant difference for: Environmental issues are important in three different groups of urban urbanity (Asymp. Sig. P_value is 0.048), where the highest Mean Rank has a group of respondents whose place of residence is city center.

Variables from the subgroup Opinion - Business (I don't need anything, I buy even when I don't intend to spend money, I buy products I see online) they don't have a normal schedule. Average grades are 5.79, 5.70, 5.27, 4.99, 4.67, 4.66 and 4.54, medians are 6, 6, 6, 5.5, 5, 5 and 5. Variables I like to pay for products and services in cash, I check the prices of all products (even in everyday shopping), A person can save a lot if they spend time finding the best deals online have a coefficient of variation less than 30%, other variables have a coefficient of variation greater than 30 %. None of the variables have outlay data.The Man-Whitney U test did not reveal a significant difference for any of the variables for men and women (all all Asymp. Sig. (2-tailed) p_value are greater than 0.05, and are 0.997, 0.606, 0.502, 0.993, 0.216, 0.283 and 0.837).The Kruskal Wallis Test did not reveal a statistically significant difference for any of the observed variables in the three different groups of urban urbanity (Asymp. Sig. P_value are greater than 0.05).Among the variable I buy when I don't need anything and I buy and when I don't intend to spend money there is a strong linear connection (r = 0.786), while among the variables I buy when I don't need anything and I buy products I see online there is a significant linear connection = 0.549).

Variables from the subgroup Opinion - Economy (I enjoy shopping online, I buy products online that are on sale, Local stores offer better prices than online stores, I always buy at the lowest price) do not have a normal schedule. The average scores are 4.70, 4.73, 4.36 and 4.52, the medians are 5, 5, 4 and 4. All coefficients of variation are greater than 30%. Variables I enjoy shopping online and I buy products online that are on sale show strong negative asymmetry, the variable Local stores offer better prices than online stores small negative asymmetry and the variable I always buy at the lowest price medium negative asymmetry.Only variables Local stores offer better prices than online stores have outliers and smaller and larger than the minimum / maximum values of variables from the 1.5IQR interval.The Man-Whitney U test did not reveal a significant difference for any of the variables for men and women (all of Asymp. Sig. (2-tailed) p_value are greater than 0.05, and are 0.900, 0.563, 0.990, and 0.893).The Kruskal Wallis Test did not reveal a statistically significant difference for any of the observed variables in the three different groups of urban urbanity (Asymp. Sig. P_value are greater than 0.05).

Variables from the subgroup Opinion - Education (I try to improve every day, I attended online courses, I put in a lot of time and effort to teach children the right things) do not have a normal schedule. Average values are 6.13, 3.96 and 4.55, medians are 6, 4 and 5. Variables I try to improve every day and I enter a lot of time and effort to teach children the right things show a strong negative asymmetry, while the variable I attended online courses have no asymmetry. I try to improve every day, it has a coefficient of variation in the amount of 17.99% and outlayer data, while other variables have a coefficient of variation of more than 30% but no outlayer data.For attending online courses, there was a statistically significant difference in relation to the sex of the respondents Male (Me=5.0, n=63) or Female (Me=3.0, n=233), U=5,912.50, z=-2.406, p=0.016, the magnitude of the impact $r = \frac{z}{\sqrt{N}} = \frac{2,406}{17,20} = 0.14$, i.e. we can say that the impact is small Cohen[11].The Kruskal Wallis Test revealed a statistically significant difference for: I attended online courses in three different groups of urban urbanity (Asymp. Sig. P_value is 0.014), where the highest grade point average (Mean Rank) has a group of respondents whose place of residence is the metropolitan area.

Variables from the subgroup Opinion - Products (I buy in traditional stores, It is difficult to assess the quality of products online, I like to see the product before I buy it, When I buy a particular brand I like to visit several stores to compare models and price, I like products simple design, I try to buy products that are new and unique, I buy products of well-known brands (because the brand indicates a certain quality), Before I make a purchase I inform myself online, I like the help and kindness I can

get in local stores) schedule. The average values of the observed variables are 5.94, 5.96, 6.15, 5.55, 5.82, 5.22, 4.26, 4.88 and 5.51, medians 6, 6, 7, 6, 6, 5, 4, 5 and 6. All variables have a strong negative asymmetry, except for the variable I buy products of well-known brands (because the brand indicates a certain quality) which has a pronounced medium asymmetry. All variables have a coefficient of variation of less than 30%, except for the variables I buy products of well-known brands (because the brand indicates a certain quality) and Before I make a purchase I get information online that have a coefficient of variation greater than 30%.For purchases in traditional stores, there was a statistically significant difference in relation to the sex of the respondents Male (Me=6.0, n=63) or Female (Me=6.0, n= 33), U=5,712.0, z=-2.870, p = 0.004, magnitude of impact $r = \frac{z}{\sqrt{N}} = \frac{2,870}{17,20} = 0.17$, i.e. we can say that the impact is small Cohen (1988).To assess the quality of products in online shopping, there was a statistically significant difference in relation to the sex of respondents Male (Me=6.0, n=63) or Female (Me=6.0, n=233), U=5,782.50, z=-2.746, p=0.006, magnitude of impact $r = \frac{z}{\sqrt{N}} = \frac{2,746}{17,20} = 0.16$, i.e. we can say that the impact is small Cohen (1988).The Kruskal Wallis Test did not reveal a statistically significant difference for any of the observed variables in the three different groups of urban urbanity (Asymp. Sig. P_value are greater than 0.05).

Variables from the Thinking subgroup - Future, I like to plan all my activities in advance, I am ready to spend more time searching for what I want (and eventually find), I like to try new things, I like to change things that are not done properly) do not have a normal schedule. The average values are 6.09, 6.16, 6.11 and 6.16, the median for all variables is 6, and the coefficients of variation are less than 20% and all variables show a strong negative asymmetry.The Man-Whitney U test did not reveal a significant difference for any of the variables for men and women (all of Asymp. Sig. (2-tailed) p_value are greater than 0.05, and are 0.885, 0.279, 0.777, and 0.442). The Kruskal Wallis Test found a statistically significant difference for: I like to try new things and I like to change things that are not done properly in three different groups of urban urbanity (Asymp. Sig. P_value are 0.007 and 0.022), where the highest mean rank Mean Rank) has a group of respondents whose place of residence is the Already metropolitan area.

Exploratory factor analysis

Factor Analysis explains the common variance of the variables related to lifestyle, i.e. the variability within the group of variables that we formed for the purposes of analysis. There are 25 variables in the groups, so all the necessary conditions are met. Given the sample size (296) the factor weight is 0.40.

*The first group of questions.*The Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.887 and Bartlett's specificity test reached statistical significance (Sig = 0.000), which indicates the factorality of the correlation matrix, i.e. factor analysis is warranted (see Table 1).

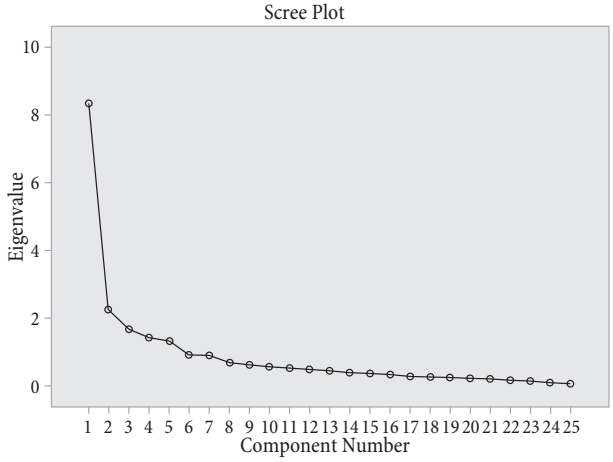
Table 1: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.887
Bartlett's Test of Sphericity	Approx. Chi-Square	3606.752
	Df	300
	Sig.	.000

As we are only interested in a component with a characteristic value of 1 or more, we have five components that have characteristic values above 1 (8,328, 2,305, 1,749, 1,519 and 1,400), which explain 33.14%, 9.22%, 7.00%, 6.08% and 5.60% of variance, i.e. these five components explain a total of 61.21% of the variance.

On the fold diagram (which is the result of the SPSS report), we noticed the existence of a clear first breaking point between the fifth and sixth components (see Figure

Figure 5: Fold diagram



Source: Author (2022), results of primary research

5).In order to determine the number of factors to be retained, a parallel analysis (PCA) was performed.

The results of the parallel analysis support the conclusion made on the basis of the pass diagram, to keep five factors for further research (see Table 2), whose characteristic value exceeds the corresponding threshold value obtained using an equally large matrix of random numbers (25 variables × 296 respondents).

Table 2:Comparison of characteristic values obtained in Principal Components Analysis

Component number	Generated characteristic value from PCA	Value obtained by parallel analysis	Decision
1	8.328	1.5202	accept
2	2.305	1.4313	accept
3	1.749	1.3666	accept
4	1.519	1.3076	accept
5	1.400	1.2575	accept

The SPSS report in the Table Component Matrix does not rotate the factor weights of each of the variables for the five components/factors. Component 1 has 20 factor weights greater than 0.40, component 2 has 3 factor weights greater than 0.40, component 3 has no factor weight greater than 0.40, component 4 has 2 factor weights greater than 0.40, and component 5 has no factor weights greater than 0.40, which indicates that a two-factor solution would still be more appropriate.

Oblimin rotation of a two-factor solution: The two-factor solution explains 42.53% of the estimated variance, with the contribution of the first component being 33.14% and the second component 9.22%, while the five-factor solution explained almost 61.21%.In the SPSS report in the Table Component Correlation Matrix we obtain the correlation coefficient among the factors (0.189). The correlation is very small, so we expect Varimax and Oblimin rotation to provide very similar solutions.

In the Communalities Table (part of the variance explained by common factors) in the SPSS report (see Table 3), the data representing the common factors explain the part of the variance for each variable. We note that the change (items) I wish I didn't have to leave the house when I buy (Communality = 0.357 and actual weight 0.556), I like to try out products I see online (on social networks). (Communality=0.320 and actual weight 0.555), I learn about prices online to save home budget (Communality=0.313 and weight 0.537), I spend a lot of time talking to friends about products and brands (Communality=0.171 and weight 0.507) with low Communality values. less than 0.4) may indicate that the variable (item) does not fit well into its component with other variables (items).The SPSS report in the Table Pattern Matrix gives factor weight items (see Table 3), and we can see that for component 1 I enjoy online shopping, online shopping is a new, fun way to shop, online shopping is easier than leaving in traditional stores. I like to search online stores, I think that online shopping offers a better choice than traditional stores, I buy online more than before they have the highest factor weights. The main items for component 2 are online shopping scares me, I don't know much about the possibilities offered by the internet, None of my friends buy online.

In Table 3, we see that each variable gave a large factor weight to only one component, and each variable was given a large factor weight by a number of variables. Component 1 is defined by the following variables: I enjoy online shopping; Online shopping is a new, fun way to shop; Online shopping is easier to go to traditional stores; I like to search online stores; I think online shopping offers a better choice than traditional stores; I shop online more than before; I shop online if my friends recommend me; I regularly follow posts about products and brands on social networks; Online shopping offers lower prices than those in traditional stores; I like to have products delivered to my home address; By shopping online we avoid problems with local stores; Friends often come to consult with me about shopping; I am among the first in the company to try new products and brands; I wish I didn't have to leave the house when I buy; I like to try out products I see online (on social media); Find out about prices online to save on your home budget; I spend a lot of time talking to friends about products and brands; In online shopping, I choose clothing items of a unique/special style, we can call it - *Internet Involvement*. Component 2 is defined by the variables: Online shopping scares me; I don't know much about the possibilities the internet offers; None of my friends buy online, so we can call this component *Inactivity*.

Table 3: Factor weights and correlation matrix of variable factors for Principal Components Analysis (PCA) with Oblimin rotation two-factor solution for activity items

Variable	Pattern		Structure		Communalities
	Component 1	Component 2	Component 1	Component 2	
I enjoy online shopping.	**.855**	-.214	**.815**	-.052	.708
Online shopping is a new, fun way to shop.	**.855**	-.254	**.807**	-.092	.714
Shopping online is easier than going to traditional stores.	**.786**	-.249	**.754**	.048	.606
I like to search online stores.	**.783**	-.284	**.739**	-.100	.609
I think online shopping offers a better choice than traditional stores.	**.772**	-.098	**.729**	-.136	.577
I shop online more than before.	**.721**	-.080	**.706**	.056	.505
I buy online if my friends recommend it.	**.691**	.025	**.696**	.156	.485
I regularly follow announcements about products and brands on social networks.	**.649**	.037	**.656**	.159	.432
Online shopping offers lower prices than those in traditional stores.	**.645**	-.025	**.645**	.428	.411
I like to have products delivered to my home address.	**.628**	-.094	**.642**	.270	.381
By shopping online, we avoid problems with local stores.	**.613**	.154	**.641**	.097	.435
Friends often come to consult with me about shopping.	**.585**	.317	**.632**	.437	.513
I am one of the first in the company to try new products and brands.	**.570**	.330	**.610**	.025	.505
I wish I didn't have to leave the house when I buy.	**.556**	.137	**.582**	.242	.357
I like to try products I see online (on social networks).	**.555**	.049	**.575**	.454	.320
I inform myself about the prices online in order to save the household budget.	**.537**	.086	**.564**	.154	.313
I spend a lot of time talking to friends about products and brands.	**.507**	.358	**.553**	.187	.171
In online shopping, I choose clothes of a unique / special style.	**.420**	-.050	**.411**	.029	.454
I also use the shopping benefits offered by loyalty cards for online shopping.	.352	.303	**.409**	.370	.256
I accept loyalty cards.	.327	.314	.387	.376	.244
I like to buy smart (I get more value in terms of price / quality).	.261	.103	.281	.152	.089
Online shopping scares me.	-.148	**.762**	-.004	**.734**	.560
I don't know much about the possibilities the internet offers.	-.054	**.680**	.075	**.669**	.455
None of my friends shop online.	-.053	**.670**	.073	**.660**	.438
I don't spend more than necessary to buy certain products (even if I don't buy the best brand).	.199	.210	.239	.248	.100

The second group of the question. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.822 and Bartlett's specificity test reached statistical significance (Sig = 0.000), which indicates the factoribility of the correlation matrix, i.e. factor analysis is justified (see Table 4).

Table 4: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.822
Bartlett's Test of Sphericity	Approx. Chi-Square	3073.696
	df	300
	Sig.	.000

As we are only interested in a component with a characteristic value of 1 or more, we have seven components that have characteristic values above 1 (6,573, 2,699, 1,743, 1,631, 1,287, 1,169 and 1,056), which explain 26.29%, 10.80%, 6.93%, 6.52%, 5.15%, 4.68% and 4.22% of variance, i.e. these five components explain a total of 64.59% of the variance.On the pass diagram (which is the result of the SPSS report), we noticed the existence of a clear first breaking point between the third and fourth components (see Figure 6).

The SPSS report in the Table Component Matrix does not rotate the factor weights of each of the variables for the five components (factors). Component 1 has 17 factor weights greater than 0.40, component 2 has 4 factor weights greater than 0.40, component 3 has 3 factor weights greater than 0.40, component 4 has no factor weights greater than 0.40, and component 5 has 2 factor weights greater than 0.40, component 6 and component 7 have one factor weight greater than 0.40, which indicates that a two-factor solution would be more appropriate in this case (see Table 5).

Oblimin rotation of a two-factor solution: The two-factor solution explains 37.09% of the estimated variance, with the contribution of the first component being 26.29% and the second component 10.80%, while the seven-factor solution explained 64.59% of the variance.In the SPSS report in the Table Component Correlation Matrix we obtain the correlation coefficient among the factors (0.241). The correlation is very small, so we expect Varimax and Oblimin rotation to provide very similar solutions.

In the Communalities Table (part of the variance explained by common factors) in the SPSS report(see Table 6), the data representing the common factors explain the part of the variance for each variable. We notice that variables: I buy even when I don't need to buy anything (Communality = 0.314 and actual weight 0.527), I buy even when I have no intention of spending money I buy (Communality=0.249 and actual weight 0.479), I try to buy products that are new and unique buy (Communality=0.289 and actual weight 0.466), A person can save a lot if time is spent in finding the best deals online buy (Communality=0.278 and actual weight 0.450), Local stores offer better prices than online stores I buy (Communality=0.258 and actual weight 0.411) with low Communality values (e.g. less than 0.35) may indicate that the variable does not fit well into its component with other variables. Regarding component 4 I like to pay for products and services in cash (Communality=0.191 and actual weight 0.413), I check the prices of all products (even in everyday shopping) (Communality=0.215 and actual weight 0.413) and I like the help and kindness I can profits in local stores (Communality=0.205 and actual weight 0.406) may not fit well into their component with other variables (items).The SPSS report in the Table Pattern Matrix gives factor weight items (see Table 6), and we can see that for component 3 I buy/try new items first, I buy the latest product models online, When I choose between two products, I always choose what is modern does not have to be comfortable, I always have pieces of clothing that are according to the latest fashion /I like to buy products that are modern have the highest factor weights. The main items for component 4 are I like to see the product before I buy it, It is difficult to assess the quality of the product online, I buy in traditional stores (shopping malls).

Figure 6: Pass diagram

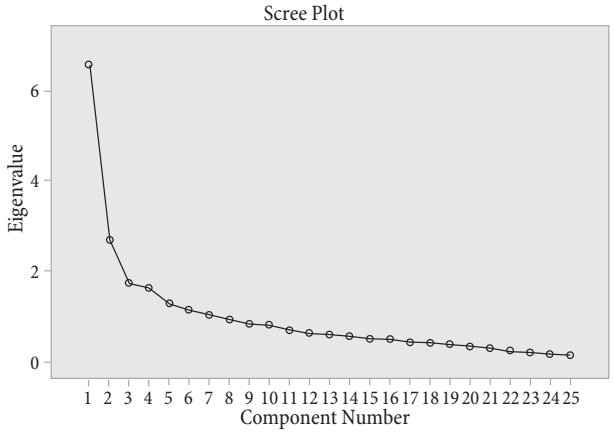


Table 5: Comparison of characteristic values obtained in Principal Components Analysis (PCA) and threshold values obtained in parallel analysis

Component number	Generated characteristic value from PCA	Value obtained by parallel analysis	Decisions
1	6.657	1.5202	accept
2	2.699	1.4313	accept
3	1.734	1.3666	accept
4	1.631	1.3076	accept
5	1.287	1.2575	accept
6	1.169	1.2054	reject
7	1.056	1.1518	reject

In Table 6, we see that each variable gave a large factor weight to only one component, and each variable was given a large factor weight by a number of variables. Component 3 is defined by the following variables: I buy/try novelties first, I buy the latest product models online, When I choose between two products, I always choose what is modern, it doesn't have to be comfortable, I always have pieces of clothing that are in the latest fashion/I like to I buy products that are modern, I enjoy shopping online, I buy products online that are on sale. I buy products of well-known brands (because the brand indicates a certain quality), I buy products I see online, I buy groceries online, before I make a purchase I get information online, I buy even when I don't need anything, to buy products that are new and unique, A person can save a lot if they spend time in finding the best deals online, Local stores offer better prices than online stores called - *Fashion Consciousness*. Component 4 is defined by variables: I like to see the product before I buy it, It's hard to assess product quality online,

Table 6: Factor weights and correlation matrix of variable factors for Principal Components Analysis (PCA) with Oblimin rotation two-factor solution for opinion items

Variable	Pattern		Structure		Communalities
	Component 1	Component 2	Component 1	Component 2	
I buy/try novelties first.	**.815**	-.147	**.779**	.049	0.628
I buy the latest product models online.	**.803**	-.168	**.763**	.025	0.608
When I choose between two products, I always choose what is modern, it doesn't have to be comfortable.	**.765**	-.127	**.735**	.057	0.555
I always have pieces of clothing that are according to the latest fashion/I like to buy products that are modern.	**.736**	-.112	**.709**	.065	0.514
I enjoy shopping online.	**.697**	-.058	**.689**	.215	0.47
I buy products online that are on sale.	**.677**	.052	**.684**	.110	0.478
I buy products from well-known brands (because the brand indicates a certain quality).	**.666**	-.041	**.658**	.168	0.431
I buy products I see online.	**.655**	.010	**.656**	.119	0.433
I buy groceries online.	**.626**	-.152	**.589**	-.001	0.369
Before I make a purchase, I get information online.	**.543**	.158	**.581**	.288	0.361
I also buy when I don't need anything.	**.527**	.102	**.552**	.229	0.314
I also buy when I have no intention of spending money.	**.479**	.066	**.509**	.291	0.249
I try to buy products that are new and unique.	**.466**	.179	**.495**	.295	0.289
A person can save a lot if they spend time finding the best deals online.	**.450**	.187	**.494**	.181	0.278
Local stores offer better prices than online stores.	**.411**	.215	**.463**	.314	0.258
I use credit cards.	.385	.071	.402	.049	0.166
I like to see the product before I buy it.	-.211	.777	-.024	**.726**	0.57
It is difficult to assess the quality of products online.	-.208	**.732**	-.032	**.682**	0.505
I buy in traditional stores (shopping malls).	-.040	**.664**	.120	**.654**	0.43
When I buy a certain brand I like to visit several stores to compare models and price.	.004	**.597**	.148	**.599**	0.358
I like to pay for products and services in cash.	.076	**.413**	.236	**.434**	0.191
I check the prices of all products (even in everyday shopping).	.137	**.412**	.406	**.444**	0.215
I like the help and kindness I can get at local stores.	.127	**.406**	.224	**.436**	0.205
I always buy at the lowest price.	.318	.366	.176	.431	0.291
I buy groceries every day in the store.	.037	.312	.112	.321	0.105

I buy in traditional stores (shopping malls), When I buy a certain brand I like to visit several stores to compare models and price, I like to pay products and services in cash, I check the prices of all products (even in everyday shopping), I like the help and kindness I can get in local stores - *Shopping Preference***.**

If we look at these four components, we can conclude that many consumers believe that overall productivity (of life) has increased with the development of the Internet. Younger generations, such as Generation Z, use the Internet 24/7/365. They collect, but also actively share information online. Their lifestyle chooses the technology they consider productivity for use, so we can conclude that the level of Internet involvement has a positive impact on the level of willingness to shop online (*Internet Involvement*). Also, Generation Z, in addition to school, spends their free time on social networks. If the only one in the "club/school" does not use online shopping, the most common excuse for inactivity is that they do not know much about the possibilities provided by the Internet or that none of the friends buy online. This inactivity does not mean that they are not online, but that it is necessary to adjust the communication strategy in such a way that you should not be afraid of online shopping (*Inactivity*). Given that today consumer technology acts as a social and cultural catalyst for creating new trends, the analysis of consumers interested in fashion who tend to express positive attitudes towards technology also has a positive impact on the development of online shopping [31]. Based on the conducted analysis, we can conclude that in Generation Z in Serbia, fashion

has a significant positive impact on the development of online shopping (*Fashion Consciousness*). Generation Z consists of people who love online shopping and like to be innovators in shopping. Their lifestyle is compatible with technological products, because they are looking for products that make life easier, more practical and more productive. So we can conclude that the level of shopping preferences has a positive effect on the willingness to make online purchases (*Shopping Preferences*).

Concluding remarks

The Internet has had a significant impact on communication between buyers and sellers. In recent years, many new digital means of communication such as email, banners, blogs, interactive television, search engine development, online communities, web conferencing and others, provide companies with benefits by promoting organization in an online environment emphasizing the importance of this medium through lower costs, flexibility, speed, high importance of the client who ultimately have control in the online environment, increased interactivity, rich amount of information, overcoming geographical boundaries and other possible obstacles that occur in the environment 24 hours a day, seven days a week. However, with the development of the Internet, we have come to a situation where a large amount of data appears, where only with good access we can use the information obtained for the successful operation of the company. Modern business requires the existence of integrated communications, and the Internet is a cheap means through which marketing managers can effectively access consumer information, achieve good segmentation and target consumers with a message that meets the requirements of that individual. Good knowledge of today's consumers/users of services, which due to the "speed of life" is often called instant consumers in the literature, is the basis for making good and timely business decisions in order to achieve competitive advantage. Marketing philosophy is changing, marketing is less and less in the function of encouraging sales, and more and more in the function of monitoring and understanding consumption.

When we analyze Generation Z, we can conclude that technology is the first thing we need to think about, because their teenage years were defined by iPod and MySpace, and their closest connections were made through Instagram and Facebook. Generation Z is the first generation to be raised in the era of smartphones, and many of them don't even know much about the time before social networks. At the same time, they create a document, edit it, post a photo on Instagram and talk on the phone, thanks to the user-friendly interface of their iPhone. They find the information they need quickly and with little effort, but this leads them to another extreme where they do not have time to critically examine the situation (ease of access to information negatively affects people's curiosity). They believe that everyone should always be available, because with constant connectivity and access to real-time information, Generation Z requires fast, frequent and personalized communication. They like sending SMS, they don't like voice calls because they take too much time between answers and they are more formal, that's why most of their communication takes place through technology, but they think that face-to-face communication is valuable. Generation Z uses Facebook, but Facebook is changing and is no longer so modern, but the usefulness of Facebook is a consequence of its wide integration with other platforms, websites and applications (e.g. Instagram, Snapchat). The preferred form of social media is Twitter, because it allows them to be informed about news in the world. They think that Facebook is for family, and Twitter is for friends. Generation Z students want to keep up with others rather than share information about themselves (they like to follow the lives of others). They like a combination of visual, audio, linguistic, spatial and musical strategies. The search for truth is at the heart of Generation Z's behavior and consumption. They are well informed about the brands that interest them, so companies must create a strategy based on diversity and uniqueness.

Since this paper is an integral part of the author's doctoral dissertation, the proposal for further development of the analysis is to include consumer lifestyle in the TAM model, because in the last 20 years, various studies have focused on identifying factors influencing ICT acceptance

used in online consumer analysis. The Technology Acceptance Model (TAM) presented by Davis [14], [15] has attracted the attention of the scientific community [32] and used is to study any kind of technological innovation. This model explains attitudes towards information technologies and predicts adoption intentions, and is also the most commonly used theoretical system in this area. However, although TAM has provided an understanding of the ICT acceptance system, a deeper understanding of the factors contributing to the acceptance of the Internet as a shopping channel is needed.

Numerous studies have included only a limited number of consumer lifestyle factors, so this study provided a detailed proposal as well as an analysis of Generation Z lifestyle factors. It is clear that members of Generation Z are similar in their characteristics throughout the world, but also intercultural differences could give an interesting description between members of Generation Z of different countries.

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TRUST AND KNOWLEDGE-SHARING FACTORS IN THE CONTEXT OF EFFICIENCY OF VIRTUAL TEAMS

Faktori poverenje i deljenje znanja u kontekstu efikasnosti virtuelnih timova

Abstract

Virtual teams, as a group of people who perform work interdependently with the division of responsibilities in the outcomes of work tasks, significantly rely on technology that supports their communication and everyday work. The topic of this paper is the research on the connection between trust factors (individual, institutional and cognitive) and knowledge sharing in a team in the context of the efficiency of virtual teams. For this purpose, a correlation-regression study was conducted on a non-random sample of 132 respondents consisting of employees from teams that function exclusively as virtual, multicultural and multinational. Also, the mediator effect of knowledge sharing factors concerning trust, and efficiency of virtual teams were examined. The obtained results confirmed that all dimensions of trust - individual and institutional and cognitive trust are important for the efficient functioning of virtual teams. Contrary to the created hypotheses, it was shown that the factor of knowledge sharing in virtual teams is not a predictor of trust or efficiency of virtual teams.

Keywords: *virtual teams; virtual teams' efficiency; individual trust; institutional trust; cognitive trust; knowledge sharing; organizational culture; Covid-19.*

Sažetak

Virtuelni timovi, kao grupa ljudi koja obavlja posao međuzavisno uz podelu odgovornosti u ishodima radnih zadataka, značajno se oslanjaju na tehnologiju koja podržava njihovu komunikaciju i svakodnevni rad. Tema ovog rada je istraživanje povezanosti faktora poverenje (individualno, institucionalno i kognitivno) i deljenje znanja u timu u kontekstu efikasnosti virtuelnih timova. U tu svrhu, na neslučajno-prigodnom uzorku od 132 ispitanika kojeg čine zaposleni iz timova koji funkcionišu isključivo kao virtuelni, multikulturalni i multinacionalni, sprovedeno je korelaciono-regresiono istraživanje. Takođe, ispitivan je i medijatorski efekat faktora deljenja znanja u odnosu poverenja i efikasnosti virtuelnih timova. Dobijeni rezultati potvrdili su da su sve dimenzije poverenja - individualno i institucionalno i kognitivno značajne za efikasno funkcionisanje virtuelnih timova. Suprotno kreiranim hipotezama, pokazalo se da faktor deljenje znanja u virtuelnim timovima nije prediktor ni poverenja, ni efikasnosti virtuelnih timova.

Ključne reči: *virtuelni timovi; efikasnost virtuelnih timova; individualno poverenje; institucionalno poverenje; kognitivno poverenje; deljenje znanja; organizaciona kultura; Kovid-19.*

Introduction

Digitalisation, globalisation and technological changes in modern society are transformatively influencing how employees work [29a]. Consequently, human resources departments have been investing increasing efforts to create a work environment that nurtures and encourages work efficiency. One of the central needs of the modern (digitized) business environment is aimed at create cooperation that is not conditioned by cultural, national and linguistic discourses [6]. This type of business cooperation has many benefits, whether we are talking about the highly specialized staff that can be physically located anywhere, time and money savings or the diversity of the virtual team in terms of creativity and originality [3].

In response to the growing trends towards business globalization, as well as the increased competitive pressures to establish greater organizational flexibility, the so-called virtual teams have emerged [37], representing a group of people doing work interdependently, sharing responsibilities in job outcomes, relying heavily on technology which supports their communication [15]. Over the last twenty years, this modality of work has become more prevalent, considering the progress and maturation of the digital world, especially in the context of telecommunications speed, the power of computer equipment, and particularly good adaptation to digital work. In addition to the prevalence of the virtual work mode, the motivation for researching virtual teams has additionally been stimulated by the fact that the context, that is, the way of working, has changed in the past year and more with the outbreak of the coronavirus pandemic, having in mind that COVID-19 played as a booster to the social and economic transformations triggered by the 4.0 Industrial Revolution, increasing the diffusion and employment of technological devices and requiring to reconsider the traditional approach to work and organization [8; 12]. Namely, teams that previously functioned as "traditional" were forced to become virtual during the pandemic, and we have been witnessing a growing trend of virtual teams in almost all sectors and areas of work where such a possibility existed. The data suggest that 80% of companies in the global labor market shifted their business to virtual or "mixed" forms of team collaboration during the early months of the pandemic [24].

As a consequence of the paradigm shift in the work environment, this paper focuses on exploring factors that may affect the effectiveness of virtual teams. Identifying these factors seems to be a very important aspect in the efforts of organizations to maintain their competitiveness in the market. The growing prevalence of modalities of work in virtual teams, as well as special efforts made to preserve and research the efficiency factors of virtual teams, have been recognized as important motives for researching this topic.

Key determinants of virtual teams

A review and analysis of the literature dealing with the concept of virtual teams reveal the existence of several definitions of this concept, based on emphasizing the importance of various factors in determining the degree of "virtual". Also, when analysing different definitions of this concept, it is necessary to consider the context of the time in which they were created, given that the understanding of virtual teams has changed with the development and integration of technology into various aspects of a business.

Early definitions of virtual teams indicated differences between virtual and traditional teams, emphasizing the physical distance and interaction of team members based on technology [23]. Some of these definitions have suggested that virtual teams are a temporary, culturally diverse, and geographically distant group of people who communicate electronically [20]. In the early definitions of virtual teams, scepticism and insecurity towards this form of work can be noticed. Namely, at the beginning of the 21st century, it was difficult to maintain confidence in the efficiency of virtual teams, taking into account the beginning of technological development, and the low level of "maturity" and presence of these teams. Studies show that in the early 2000s, a small percentage of teams that functioned as virtual managed to achieve their goals, with a significant failure rate [14]. Aspects that were identified as problematic in the early development stages of virtual teams were weak individual commitment, workload,

unclear job roles, absenteeism, and social phenomena such as social loafing. Also, Mowshowitz [26] points out another problematic aspect related to the functioning of virtual teams, and that is that clients themselves can notice the lack of consistency, consistency and reliability in virtual business and work. In addition to all the above, the initial stages of the development of virtual teams were accompanied by suggestions that the functioning of teams should not be exclusively virtual. The need to maintain traditional teams (face to face) or a hybrid approach [20] was highlighted. The beginning of the development of virtual teams was also accompanied by the presence of strong concerns about establishing and maintaining trust among team members. Trust requires contact [17], which in the early stages of virtual teams was hampered by insufficient technological capabilities. Namely, in the transitional phases, when the technology was not yet developed to the extent it is today, nor was it incorporated into the labor market, the representation of virtual teams was not significant. In studies examining the effectiveness of virtual teams, most respondents felt that virtual communication was not as effective as face-to-face communication, while half of the respondents said they were confused about virtual collaboration-based technology [14].

With the further development of technology, the focus of researchers has gradually shifted from comparing virtual and traditional teams to attempts to define the "virtuality" of teams [23]. At this stage, the most important thing was to operationalize, that is, to understand well what virtuality specifically means - to define what kind of functioning, that is, the degree of virtuality is needed for a team to be characterized as virtual. Certain authors suggest that the way team members are geographically distributed, as well as their reliance on technological capabilities, is a more significant determinant of team virtuality, rather than comparing these teams to traditional ones [25]. Definitions that emerged in the 2000s (in the so-called "middle stage of development" of virtual teams) were aimed at emphasizing that these are primarily teams and that virtuality should be treated as a characteristic of these teams [23]. Consequently, these authors have defined virtual teams as teams whose members use technology to varying degrees, doing work beyond geographical, temporal, and relational boundaries, to accomplish common work tasks [23].

In the last few years, due to the rapid development of technology and the changes it has introduced in the ways of performing work tasks, interest in virtual teams among researchers, but also the human resources sector in organizations, has flourished. Virtual teams have emerged as a powerful structure in the modern business environment characterized by the use of information and communication technologies (ICT), changes in organizational design and a multicultural workforce [25]. Modern definitions of virtual teams are becoming flexible, and open to change in the context of a dynamic business environment. It is emphasized that this is a modality of work in which team members are geographically distant, with limited contact (face to face), and work is done interdependently to achieve common goals [9]. Changes in the field of defining virtual teams have been accompanied by an increased number of studies that directly or indirectly deal with the concept of virtual teams. Unlike earlier studies that concluded that virtual teams are not as successful as traditional ones [14], recent studies show just the opposite. Namely, research shows that virtual teams can be highly efficient and with better performance compared to traditional teams if they have managed adequately [34]. Also, virtual forms of business collaboration can have a positive effect on employee productivity [14]. Since virtual teams have become an efficient form of business, the central topic becomes the research of the factors that affect that efficiency, while the comparison with traditional forms of business remains in the background.

(Dis)advantages of virtual teams

Some of the key advantages and disadvantages of virtual teams have been identified in the academic literature. One of the central advantages of virtual teams is that this type of work organization allows access to team members who have higher levels of expertise. This is since virtual teams are not geographically limited in terms of staff recruitment, nor do they have to relocate highly qualified team members outside the local region. Thus, virtual

teams allow all organizations to recruit the most talented candidates in a given field, regardless of their geographical location [3]. Moreover, virtual teams provide coverage of the work process in different time zones, which is enabled by recruiting employees in different geographical locations, so the working day can last twenty-four hours instead of eight, as is the case with traditional teams [28]. Some authors emphasize the importance of virtual functioning in the context of reducing operating costs, such as travel expenses, per diems, materials, maintenance and lease of office space [3]. Given that virtual teams represent a heterogeneous, multicultural working group, it is inevitable that there are differences in opinion, approaches and perspectives, which is another of their advantages: the diversity of the team provides creativity and originality in work [3]. On the other hand, the heterogeneity of team members is important in the context of efforts to create an inclusive work environment, as it develops values that imply equality among all team members [3]. Finally, at the individual level, the advantages of the virtual way of working imply a high level of flexibility and the ability to manage time, along with high responsibility, motivation and empowerment of team members [25].

On the other hand, the key disadvantage of this form of work is the difficulty in establishing trust among team members, especially if the team operates exclusively virtually [9]. Also, working in a virtual environment is characterized by tendencies toward weaker sharing of knowledge and information within the team [37]. Certain authors also recognize the difficulties in monitoring and managing virtual teams [3], especially in the context of monitoring individual performance [20]. Namely, in virtual forms of business, it is difficult to assess the individual contribution of each team member, given that the focus is on the overall achievement of the team. Another disadvantage of this way of working is the fact that not all employees are psychologically adapted to function exclusively in a virtual way [3]. Virtual forms of business in that case exclude that part of the workforce that is not able to adapt and function efficiently as a virtual team. Namely, many employees need constant contact with the team, while virtual ways of working make them feel alienated and isolated. Earlier, at the beginning of the development of this modality of work, a key shortcoming was the technological inadequacy of organizations in this way of working [3], which primarily refers to the fact that not all employees are technologically trained for this form of work, and that a small number of organizations is technologically ready for the transition to exclusively virtual functioning. It could be said that today, with the appearance of "digital generations" in the labor market, the situation is far better. Namely, as today's labor market is made up of generations that have "grown" with the use of digital technologies, the problem of technological readiness of organizations is becoming almost negligible.

The efficiency of virtual teams

The need for a comprehensive definition of virtual teams, their advantages and disadvantages, is important in determining what is needed for such a team to function effectively [16]. When we talk about efficiency, we should first define what exactly efficiency means in the context of virtual teams. The first dilemma about defining efficiency is related to the fact that efficiency at the individual level differs significantly from that at the collective level, within an organization or team [28]. However, efficiency at the collective level affects that at the individual level, and vice versa. Efficiency in the context of virtual teams would refer to the achievement of virtual teams (collective level), but also to the job satisfaction that would be felt by each team member (individual level). Gibson and Cohen [16] believe that both business and team outcomes should be taken as measures of the effectiveness of virtual teams. Possible business outcomes include productivity, goal achievement, innovation, timeliness, customer satisfaction, and learning at the organizational level. Possible human outcomes imply certain attitudes of members such as commitment, satisfaction, and longevity, i.e., the capacity to persevere in future joint work. The measure of achievement, that is, the efficiency of the virtual team will also depend on the team itself, i.e., on the type of work that the given team performs [16]. Other authors point out the three basic criteria that should be taken into account when defining the efficiency of virtual teams [22]. The first criterion refers to the level of team productivity

and considers the team's achievement, i.e., the extent to which the group's performance, product or service meets the required standards. The second criterion refers to the team's ability to learn and improve its functioning during the performance of work tasks (in the future), thus emphasizing the team process, and not the outcomes concerning team functioning in the present. Finally, the third dimension relates to the extent to which the team can provide satisfaction to each individual member. This dimension also indicates the process itself, but to a greater extent refers to individual team members [22]. Looking at the above criteria for defining the efficiency of virtual teams, we notice that efficiency can be treated in different ways, depending on which criterion we focus on. In the case of quality criteria, this can be e.g., performance measurement, and a qualitative measure of the subjective perception of team members. In addition to qualitative and quantitative measures, monitoring the team process itself can also be a measure of team efficiency [22].

After defining efficiency in the context of virtual teams, we will focus on defining efficiency factors of virtual teams. By definition, virtual teams rarely or never meet face to face, and in such a work environment they also face different factors that affect their effectiveness compared to traditional teams. For example, the difference in time zones can affect the efficiency of coordination between teams. It often happens that the level of successful coordination is directly related to the level of the time difference - the greater the time difference, the lower the level of coordination [10]. The language barrier can pose additional problems in full understanding between team members, and the efficient functioning of virtual teams. Among the various criteria that we take into account when considering the efficiency of virtual teams, the most important is the one according to which teamwork is a source of satisfaction for each of the team members. In other words, a team cannot be effective if its members are not satisfied with the way it works [22]. Team member satisfaction is a measure of efficiency based on subjective perception. However, researchers suggest that the perception of team members can be a very important predictor of team efficiency, as team members are key to doing the job and directly affect the productivity of the entire team, and thus its satisfaction [22]. In short, if a member is not satisfied with the functioning of his virtual team, then we cannot even talk about the existence of any "form" of efficiency in that team. Moreover, the technologies used to perform various business tasks within an organization are often, due to the cost-effectiveness and ease of system maintenance, standardized for each organization individually. In terms of technology, members of virtual teams are usually structured as individual systems, where each member has a technological environment that suits him best as an individual (use of different licenses, software, subscription to software tools). Such differences in technologies used within the same virtual team, as well as different levels of technological literacy, also affect team efficiency [31].

This paper aims to examine the influence of the factors identified as the most important on the efficient functioning of virtual teams. After reviewing the scientific literature, we concluded that several factors can affect the efficiency of virtual teams. However, in this research, we will focus on two factors that have been identified as most important for the effective functioning of virtual teams - trust and knowledge sharing within the team [32; 28; 37; 27]. According to the definition of the American Psychological Association [APA], "trust is reliance on someone/ something and dependability on them". In interpersonal relationships, "trust refers to the reliability that a person or group of people has concerning other persons or groups" [2]. Different authors recognize and distinguish trust at the individual and collective level, that is, the so-called "individual trust" and "collective trust". Collective trust is defined as a psychological state, common to all team members, which is characterized by acceptance of the vulnerability of others and is based on the expectations, intentions or behaviors of others within the team [30; 16]. Collective trust in virtual teams is defined as the degree of reliance of individuals on their "remote" team members [32]. As discussed earlier, trust is an important factor for the functioning of teams of any type and structure, but special importance is attached to the development of trust in the context of virtual teams. Namely, researchers in this field believe that trust is an important element in preventing the geographical distance between members of the virtual team from becoming psychological [1]. In

addition, other authors point out several benefits that contribute to the development and nurturing of trust in the organization such as increasing security and reliability in relationships, with tendencies toward creating an open and meaningful exchange of information and knowledge [16]. Also, trust affects the achievement at the level of the entire organization, and by that, it meant the fulfilment of goals, the quality of work performed, timeliness and flexibility [16]. Developing trust in the context of virtual teams is an important but complex task. Researchers recognize as a potential problem the impossibility of observing different forms of behavior that is possible only in conditions when teams are seen every day (in the so-called traditional teams), which allows them to develop and maintain trust [1]. Also, the absence of physical (geographical) closeness, and differences in ethical origin and experience, are often factors that further complicate socialization in virtual forms of business [16]. Gibson and Cohen [16] also point out that cultural differences in the composition of virtual teams can be negatively related to the possibilities of establishing trust. When it comes to specific forms of trust, some authors have defined three dimensions of trust that relate specifically to the virtual context, namely: individual (personal), institutional (organizational) and cognitive trust [32]. Individual trust develops in early childhood when an individual seeks and receives help from people who care for him. Early establishment of trust inevitably affects the behavior of the individual in the organizational context, because trust in the members of the organization is a behavior that is developed and shaped by the personality of the individual [32]. Institutional trust, which has been developed following institutional theories, refers to the consideration that the norms and rules of organizations are "guides" for the behavior of individuals. The institutional trust exists when individuals respect the rules and regulations of the organization. Namely, the belief that the organization requires the harmonization of different rules, i.e., norms among its members, influences team members to develop trust in each other, even if they have never met live [32]. This form of trust enables the organization and rapprochement of individuals around a common value, in this case, the norm that the organization imposes. In addition to the positive aspects of this dimension of trust, some authors also recognize the negative ones. These negative aspects concern that institutional trust can be based on fear, and that team members will develop trust out of fear of being punished by the organization [32]. Considering this form of trust in the context of the functioning of virtual teams, it seems inconceivable that members of an organization develop organizational trust based on fear. Rather, it is a matter of fear that they will not be accepted by the organization if they do not conform to its way of working and norms. Cognitive trust is based on patterns that individuals develop towards their team members, relying predominantly on cognitive indicators - signs and impressions [32]. By interacting with each other, individuals use three types of categorization processes to develop trust-based beliefs – grouping, reputation-based categorization, and stereotyping [32]. All these types of categorization processes involve the collection of information about others and the cognitive processing of that information, in terms of developing trust in others [32]. Grouping refers to the fact that team members share common goals that make them perceive each other positively, with a sense of trust [32]. Reputation-based categorization suggests that individuals with a reputation are trusted, that is, perceived as trusted. Stereotyping suggests that individuals in social situations create impressions of others based on their physical appearance or through other models of interaction, with positive stereotyping leading to the development of behaviors based on trust, and vice versa. As can be seen, members of virtual teams may rely on different aspects in attempts to build trust in a virtual context that is different from the ways and mechanisms by which trust is created in situations where teams meet daily and can observe the behaviour of team members in real-time.

Certain authors recognize the tendency to share knowledge as a key indicator that members of virtual teams can observe and rely on in attempts to build trust among team members [1]. Knowledge sharing is defined as the intentional application of one's ideas, insights, knowledge, and experience to another individual, either through an intermediary (e.g., a computer system) or directly [11]. Nowadays, when virtual forms of business

are common, generating new knowledge and using it (sharing) to produce new products or services is crucial for maintaining or improving the competitiveness of companies [21]. Hence, a large number of studies, which examine the tendencies towards knowledge sharing and their impact on the development of trust, as well as consequently on the efficiency of virtual teams, point to the importance of this factor in perceiving and understanding the virtual functioning of teams. Researchers have recognized that knowledge sharing is key to achieving the effectiveness of both traditional and virtual teams, as well as how team members rely on each other [36]. Virtual teams are usually made up of groups of people belonging to different cultures, business experiences and expertise. It is this diversity that is important when a team faces a problem, given that they have the potential to improve team success and quality of business outcomes through knowledge sharing [35; 18; 36]. Also, knowledge sharing plays a key role in bringing people together, as it directs people towards sharing experiences, specific knowledge and skills [21]. Researchers attach special importance to the knowledge sharing factor for the efficient functioning of virtual teams, believing that knowledge sharing is a factor that directly affects the efficiency of virtual teams, while trust has an indirect impact. Thus, researchers classify knowledge sharing as a mediating factor, and trust as a factor that influences the tendency to share knowledge in a team, and thus efficiency [36]. Consequently, trust is a key factor in the development of tendencies towards knowledge sharing in virtual teams [28]. Namely, individual (personal) trust is seen as an aspect of trust which is a prerequisite for sharing knowledge in teams. The reasons for this should be sought in the fact that people are more willing to share their knowledge with people they trust, and individual trust is of special importance in this context [28]. As individual trust is often difficult to establish when a team functions exclusively virtually, it is important to note other aspects of trust and their impact on the tendency to share knowledge in virtual teams. Namely, it is about cognitive and institutional trust. Studies have pointed to the importance of cognitive, and especially institutional trust, for sharing knowledge among members of virtual teams [19; 28].

Methodology

The main goal of this research is to examine the nature of the connection between two key factors in the effectiveness of virtual teams - trust and knowledge sharing in the team. As pointed out earlier, the trust factor consists of three dimensions: individual, institutional, and cognitive trust, and therefore the predictability of all three dimensions concerning the effectiveness of virtual teams will be examined. We will also examine the mediating effect of knowledge-sharing factors on the relationship between trust and the effectiveness of virtual teams.

Following the objectives of the research, three research hypotheses were singled out, conceived under the results of previously conducted research [32; 36; 37; 28; 21]:

H1: Trust (individual, cognitive, institutional) predicts the effectiveness of virtual teams.

H2: Trust is correlated with knowledge sharing in virtual teams.

H3: Knowledge sharing predicts the effectiveness of virtual teams.

The non-experimental research was conducted in the period January-February 2022. The research sample was non-random and consisted of 132 respondents who were employees of Prota Ventures, Funl Studios and Movers Development, whose teams function exclusively as virtual, multicultural and multinational. The virtual teams that participated in the research were geographically located in different areas (mostly in Serbia and the USA). At the very beginning of the questionnaire, in addition to a brief instruction concerning the research, informed consent was included, necessary for the research to be conducted.

The data collection procedure was organized online through an electronic questionnaire (Google Forms) which was based on the integration of three instruments:

1. An instrument that examines the effectiveness of virtual teams on a seven-point Likert-type scale, where respondents answered to what extent they (dis)agree with the given statements [22],
2. An instrument that examines three types or dimensions of trust - individually, institutionally and cognitively with its three subcategories

(grouping, reputation based on categorizations and stereotyping), also on a seven-point Likert-type scale [32], and

3. An instrument that examines tendencies towards knowledge sharing [5].

Also, in the questionnaire itself, the respondents answered the question about the "degree of virtuality", i.e., the degree to which their team functions as a virtual one. The importance of including this question in the questionnaire is the confirmation of the high degree of "virtuality" of the surveyed teams, which was necessary for the research to be conducted. After the data collection procedure, a database was created and data processing in The Statistical Package for the Social Sciences (SPSS) followed. On that occasion, the following analyses were conducted:

1. Descriptive statistics: arithmetic mean, standard deviation, minimum, maximum.
2. Correlation: Pearson's correlation coefficient. The correlation of trust (individual, institutional and cognitive), as well as the correlation of knowledge sharing in the team and the efficiency of virtual teams, which was set as a criterion variable, were examined. In addition, the correlation of trust (all three dimensions) and knowledge sharing in the team was examined, to assess the mediator effect of the knowledge sharing variable.
3. Multiple linear regression: criterion variables (efficiency of virtual teams) with research predictors, i.e., trust (individual, institutional and cognitive). Also, multiple linear regression was performed for the criterion variable of virtual team efficiency, with the predictor variable of knowledge sharing in the team.

Results

Table 1 shows the results of descriptive statistics for all examined variables in the research (trust: individual, institutional, and cognitive, knowledge sharing, the efficiency of virtual teams). As discussed earlier, an instrument consisting of three integrated questionnaires representing Likert scales ranging from 1 to 7 was used in this study; with 1 - I do not agree at all (minimum) and 7 - I completely agree (maximum).

By looking at the table, we can notice that the average score of the efficiency variable of virtual teams (M = 6.23) is higher than other variables examined in the research, for which average values were obtained. Then, Table 2 shows Pearson's correlation coefficients for all examined variables in the research (efficiency of virtual teams, trust: individual, institutional and cognitive, knowledge sharing in virtual teams).

Table 1: Descriptive statistics

	Minimum	Maximum	*M*	*SD*
The efficiency of the virtual team	1	7	6.23	0.78
Trust	1	7	5.57	1.0
Individual trust	1	7	5.72	0.95
Institutional trust	1	7	5.76	1.14
Cognitive trust	1	7	5.24	1.20
Knowledge sharing in virtual teams	1	7	5.67	0.87

Table 2: Correlation of the examined variables

	1	2	3	4	5	6
The efficiency of the virtual team	1					
Trust	.81**	1				
Individual trust	.67**	.86**	1			
Institutional trust	.83**	.91**	.64**	1		
Cognitive trust	.71**	.95**	.74**	.81**	1	
Knowledge sharing in virtual teams	.11	.03	.11	-.02	0.2	1

Note: * - $p < 0.05$; ** - $p < 0.01$

By looking at the table, we can notice the existence of several significant correlations between the examined variables. First of all, we notice the existence of intercorrelations. Trust significantly correlates with other dimensions of trust (individual, institutional, cognitive). Also, the dimensions of trust are significantly correlated with each other. As the subject of this research is to examine the relationship between trust and the effectiveness of virtual teams, as well as to examine the relationship between knowledge sharing and the effectiveness of virtual teams, we will pay attention to the correlations obtained between these key variables. Thus, following the key hypothesis of our research, a positive significant correlation was obtained between trust and efficiency of virtual teams (r = .81, p = .00). Also, there is a positive significant correlation between all dimensions of trust and efficiency of virtual teams, following the set hypotheses. Individual trust positively correlates significantly with the efficiency of virtual teams (r = .67, p = .00). Institutional trust positively correlates significantly with the efficiency of virtual teams (r = .83, p = .00). Also, the dimension of cognitive trust positively correlates significantly with the efficiency of virtual teams (r = .71, p = .00).

When it comes to the second variable that is important in understanding the efficiency of virtual teams and knowledge sharing, we created a hypothesis about the relationship between this variable and the efficiency of virtual teams. However, the hypothesis has not been confirmed. In this study, knowledge sharing in virtual teams does not correlate significantly with the effectiveness of virtual teams (r = .11). Also, it was shown that knowledge sharing does not correlate with another factor, i.e., with trust in virtual teams (r = .03), and we can conclude that the hypothesis about the mediator effect of knowledge sharing has not been confirmed. Namely, to talk about knowledge sharing in general as a mediator variable that affects the relationship between trust and the efficiency of virtual teams, there would have to be a correlation of this variable with both trust and the efficiency of virtual teams. That is, there must be a correlation of all variables in the mediator model - a correlation between the efficiency of virtual teams and trust, a correlation between efficiency and knowledge sharing, and a correlation between trust and knowledge sharing in a team [4].

Table 3 shows the regression model with the efficiency of virtual teams as the criterion and trust as the predictor.

Regression analysis with the efficiency of virtual teams as a criterion and trust as a predictor is statistically significant (R^2 = .66; $F_{(1,132)}$ = 257.89; p <.00). The correlation coefficient is R = .81, while the determination coefficient is R^2 = .66, and we conclude that trust in virtual teams explains 66% of the variance in the efficiency of virtual teams. We can conclude that trust in virtual teams predicts the efficiency of virtual teams (β = .81; p <.00). Therefore, the results of the regression analysis are in line with the expectations of the research, trust in virtual teams is a significant predictor of success, i.e., the efficiency of virtual teams. Furthermore, we will look at regression analysis with the efficiency of virtual teams as a criterion and the dimensions of trust as a predictor. We will examine the significance of each model, i.e., each predictor individually.

Regression analysis with the efficiency of virtual teams as a criterion and individual trust as a predictor is statistically significant (R^2 = .45; $F_{(1,132)}$ = 105.14; p <.00). The correlation coefficient is R = .67, while the determination coefficient is R^2 = .45, and we conclude that individual trust in virtual teams explains 45% of the variance in the efficiency of virtual teams. Thus, individual trust in virtual

Table 3: Regression model with the efficiency of virtual teams as a criterion and trust as a predictor.

	B	*SE*	*ß*	*t*
Trust in virtual teams	0.64	0.04	0.81	16.06**

Note: * - p < 0.05; ** - p < 0.01

Table 4: Regression model with the efficiency of virtual teams as a criterion and individual trust as a predictor.

	B	*SE*	*ß*	*t*
Individual trust	0.55	0.05	0.67	10.25**

Note: * - p < 0.05; ** - p < 0.01; reliability coefficient α= .79

teams predicts the effectiveness of virtual teams ($\beta = .67$; p <.00). Considering the results of regression analysis, we can conclude that they are following the hypothesis. Individual, personal trust is a significant predictor of the effective functioning of virtual teams.

Table 5 below shows regression analysis with the effectiveness of virtual teams as a criterion and institutional trust as a predictor.

We can conclude that the regression analysis is statistically significant ($R^2 = .69$; $F_{(1,132)} = 287.65$; p <.00). The correlation coefficient is R = .83, while the determination coefficient is $R^2 = .69$, and we conclude that institutional trust explains 69% of the variance in the efficiency of virtual teams. The results of the regression analysis indicate that institutional trust predicts the efficiency of virtual teams ($\beta = .83$; $p < .00$). Institutional trust is a strong, i.e., the strongest predictor of the effectiveness of virtual teams.

Table 6 shows regression analysis with the efficiency of virtual teams as a criterion and a dimension of trust (cognitive trust) as a predictor.

Regression analysis with the stated criterion and predictor is statistically significant ($R^2 = .51$; $F_{(1,132)} = 135.21$; p < .00). The correlation coefficient is R = .71, while the determination coefficient is $R^2 = .51$, so we can conclude that cognitive trust explains 51% of the variance in the efficiency of virtual teams. The results of regression analysis, for the last examined dimension of trust, indicate that cognitive trust significantly predicts the efficiency of virtual teams ($\beta = .71$; p <.00). The presence of cognitive trust in the team (as well as the remaining two dimensions of trust) presupposes the efficient functioning of virtual teams.

Summarizing the results of all dimensions of trust for the efficient functioning of virtual teams, we can again point out that each dimension, i.e., each predictor proved to be statistically significant in considering the efficient functioning of virtual teams.

Finally, we will look at the regression analysis of another predictor that is important for this research, more precisely, sharing of knowledge in virtual teams.

Looking at the table, we conclude that the regression analysis is not statistically significant ($R^2 = .01$; $F_{(1,132)} = 1.60$). The correlation coefficient is R = .11, while the determination coefficient is $R^2 = .01$. Based on the above, we can conclude that the sharing of knowledge in virtual teams explains a very small percentage of the variance in the effectiveness of virtual teams. Thus, knowledge sharing in virtual teams is not a significant predictor of the effectiveness of virtual teams ($\beta = .11$). The obtained result is not following the hypothesis about the predictive value of the knowledge sharing factor for the efficient functioning of virtual teams.

Discussion

In this paper, we investigated the relationship between factors of trust and knowledge sharing in virtual teams and the effectiveness of virtual teams. The aim was to investigate whether certain factors (which have been shown in previous research to affect the effectiveness of virtual

Table 5: Regression model with the efficiency of virtual teams as a criterion and institutional trust as a predictor.

	B	*SE*	*ß*	*t*
Institutional trust	0.57	0.03	0.87	16.97**

Note: * - p < 0.05; ** - p < 0.01; reliability coefficient α= .90

Table 6: Regression model with the efficiency of virtual teams as a criterion and cognitive trust as a predictor.

	B	*SE*	*ß*	*t*
Cognitive trust	0.46	0.04	0.71	11.63**

Note: * - p < 0.05; ** - p < 0.01; reliability coefficient α= .75 (reputation categorisation) do α= .94 (message-related stereotyping)

Table 7: Regression model with the efficiency of virtual teams as a criterion and knowledge sharing as a predictor.

	B	*SE*	*ß*	*t*
Knowledge sharing in virtual teams	0.10	0.08	0.11	1.26

Note: * - p < 0.05; ** - p < 0.01; reliability coefficient α= .86

teams) can be a significant predictor of the effectiveness of virtual teams. To further examine the nature of the relationship between the two concepts, we focused on the relationship between specific dimensions of trust and the effectiveness of virtual teams. The dimensions of trust we explored were: individual trust, institutional trust, and cognitive trust.

In the rest of the paper, we will discuss each of the previously created hypotheses, in the context of the results obtained in this study. Hypothesis 1 of this research has been confirmed – the existence of trust in virtual teams predicts the efficiency of virtual teams. Namely, it turned out that all three dimensions of trust presuppose the efficient functioning of virtual teams. That is, in virtual teams in which there is trust among members, there is a significant level of efficiency – team members are satisfied with their work and are successful in performing work tasks. The obtained finding is in line with previous knowledge about the importance of the trust factor for the efficient functioning of virtual teams, i.e., the correlation and predictive value of this factor, in the context of the efficiency of virtual teams [7; 33; 28; 37]. Also, in a recent study, it was shown that trust is the most important variable, which has a high predictive value for efficiency, i.e., achievement of virtual teams [14]. Also, it is important to note that modern studies indicate that trust has a stronger impact on the efficiency (achievement) of virtual teams, compared to the impact that trust has on the achievement of traditional teams [13]. Thus, the development of trust in virtual teams can be seen as a key factor that will ensure the success and achievement of the virtual team, as well as the satisfaction of each individual member, and the general "maturity" of the whole team [13].

In the conducted research, we tried to understand the impact of specific dimensions of trust, in the context of their predictive value for the efficiency of virtual teams. In other words, we investigated the extent to which individual, institutional, and cognitive trust predict the effective functioning of virtual teams. In the regression model, it was shown that all dimensions of trust significantly predict the efficiency of virtual teams. Individual trust, as pointed out earlier, is a dimension of trust that provides individuals with an experience of trust in relationships with others. Thus, an individual who has developed this form of trust in people believes like things, perceiving them as persons on whom he/she can rely [28]. In the conducted research, as well as in previously conducted studies, the finding on the importance of this dimension in achieving the efficiency of virtual teams was again obtained [32; 28; 37]. The existence of individual trust among team members affects, that is, predicts the efficiency of the virtual team. So, when individuals perceive members of a virtual team as people they can rely on, as people they trust, it also has a positive effect on the general mood in the organization, and thus on the job satisfaction that team members feel and the achievements they achieve. Then, the results of the conducted research indicate that the dimension of institutional trust is the most important predictor of the efficiency of virtual teams. In other words, institutional trust among members of virtual teams best predicts team efficiency (more important than the other two dimensions, individual and cognitive trust). In other studies, institutional trust is a significant predictor of success, but not the most significant, as is the case with our research [28; 37]. The reasons for the high predictability of institutional trust for the effectiveness of virtual teams may need to be sought in the fact that institutional trust is an important "guide" for individuals, guiding their behavior within the organization. Namely, the belief that the organization requires the harmonization of different rules, i.e., norms among its members, influences team members to develop trust in each other, even if they have never met in person [32]. The belief of team members that they share common norms and values with other members influences the development of mutual trust, and has a strong effect on efficiency, more precisely, on the achievement of virtual teams. Cognitive trust develops in an individual's relationships with other team members and refers to various "cognitive schemes" that guide the development of trust and the behavior of individuals in the team [32]. In line with the hypothesis, the dimension of cognitive trust is a strong predictor of the effectiveness of virtual teams. Thus, the trust that develops based on the messages exchanged among team members, the good reputation of individual members, as well as the perception of the presence and behavior of team members, predicts

the effectiveness of virtual teams. The obtained finding is following the results of previous studies [28; 37].

Contrary to the defined hypotheses, this study showed that the knowledge sharing factor is not a significant predictor of the effectiveness of virtual teams, nor trust in virtual teams. Thus, we conclude that Hypothesis 2 and Hypothesis 3 have not been confirmed. Possible reasons for the lack of predictability of knowledge sharing factors for other variables (efficiency of virtual teams and trust in virtual teams) should be sought in the very complexity of the relationship between all variables presented in the research model. Namely, earlier studies that examined the relationship between the variables of trust and knowledge sharing in virtual teams showed the absence of consistent findings. One study showed that cognitive trust is not a significant predictor of knowledge sharing [28]. Also, another similarly designed study concludes that neither cognitive trust nor institutional trust as significant predictors of the effectiveness of virtual teams [37]. Other studies have attempted to further explain the nature of complex relationships between trust variables, knowledge sharing, and the effectiveness of virtual teams through the implementation of complex models [36]. In the mentioned model, two additional variables were introduced: the degree of team virtuality and the independence of work tasks. These two variables have been shown to significantly shape the relationship between trust and knowledge sharing, as well as the relationship between knowledge sharing and the effectiveness of virtual teams. Namely, greater independence of work tasks negatively affects the relationship between trust and knowledge sharing [36]. Also, it has been shown that the independence of work tasks harms the relationship between knowledge sharing and the efficiency of virtual teams. All of the above findings may indicate the need to introduce other variables into this and studies that would address this topic, which would further influence the understanding of the relationship between knowledge sharing and the effectiveness of virtual teams. Thus, there may be mediator variables, such as the nature of work tasks in virtual teams, that significantly shape the relationships of all key variables in the research. The lack of connection between the variable of knowledge sharing and all other variables in the research can be observed in the context of the fact that in this research only one aspect of knowledge sharing in virtual teams was examined. The examined aspect, above all, refers to the sharing of ideas and knowledge (expertise) among team members. However, as previously established, knowledge sharing is a multidimensional variable, and it would be methodologically more relevant to examine other, different "forms" of knowledge sharing in virtual teams [36]. As this study showed that there is no significant correlation between predictor variables (trust in virtual teams and knowledge sharing in virtual teams), as well as significant correlations between the predictor variable (knowledge sharing) and the criterion variable (efficiency of virtual teams), Hypothesis 4 was not possible to test. Thus, as noted earlier, examining the mediator effect of a particular variable requires the existence of correlations of all variables in the model for which the mediator effect is being examined.

Conclusion

The central hypothesis of this research has been confirmed – trust in virtual teams predicts their efficiency. Also, this research suggests that all dimensions of trust are important for the efficient functioning of virtual teams. Namely, individual, institutional and cognitive trust are predictors of the effectiveness of virtual teams. Contrary to expectations and findings in previous studies, in our research, knowledge sharing in virtual teams did not prove to be a significant factor, i.e., it does not represent a predictor of trust or efficiency of virtual teams. It is the lack of predictability of this important factor, knowledge sharing in virtual teams, that may indicate the need for a different examination or understanding of the role of this factor in the model of efficiency of virtual teams. Therefore, it is possible that knowledge sharing should be observed and researched through different indicators, such as, for example, communication among team members, empowerment of other members, cohesion, distribution of work tasks, etc.

Given that the key finding of the conducted research is the importance that trust has for the efficiency of virtual teams, the central topic becomes the design of ways in

which it is possible to develop trust in virtual teams. The development of trust will affect the efficiency of virtual teams, and, from that point of view, it is more important to focus on ways to improve trust, than to directly influence and emphasize the need for achievement. Many modern organizations are primarily focused on key performance indicators while forgetting the importance of factors that directly affect achievement. However, as this research has shown, the relationship between the factors and efficiency of virtual teams is not linear – there seems to be a multitude of intermediate factors that shape the relationship between trust and the effectiveness of virtual teams.

Practical contributions to the research of this topic are centred around concrete findings that could be implemented in human resources practice after the research. Namely, the findings could be important in constructing guidelines for improving the work of virtual teams, specifically, for encouraging factors that contribute to the efficiency of virtual teams. Also, the importance of research is reflected in the need for rapid adaptation to virtual forms of (business) functioning. Therefore, understanding the factors that contribute to the efficiency of virtual teams seems to be very important in the context of preserving competitiveness in the modern labor market. Participation in the process of developing trust in virtual teams can be achieved through the communication of members via intranets, groups on social networks, through the participation of team members in virtual teambuilding (using specific tools through which team members play different online games or connect in common interests), by organizing a daily dose of "chatting", recording and sharing various videos in which team members introduce themselves to each other and help them get to know each other better. The ultimate goal of these activities is to achieve a culture of trust and common identity, for the virtual team to function more fluidly.

The limitation of the conducted research is reflected in the fact that only one form, i.e., one form of virtuality, was examined. Other researchers have also suggested that virtual teams, given their specific configurations, are difficult to reduce to a single form. There are several forms, i.e., a configuration of virtuality that would be in line with the set definition of virtual teams. For example, members of virtual teams can be deployed in several different geographical locations (with several members in each location) or they can be deployed in only two locations (which is the case with the conducted research). Another important limitation of the research is reflected in the structure of the sample itself, which consisted of 132 respondents, and raises the question of the possibility of generalizing the findings to the general population. It is important to emphasize that the research sample consisted of respondents from Serbia and the USA, and the question arises to what extent cultural factors could also contribute to the obtained results. Members of the American area may have a different experience and understanding of the key concepts of this research, such for example, knowledge sharing, in relation to respondents from Serbia. In other words, in future research on this topic, it would be important to include (or at least control) the cultural influence of certain factors on the examined phenomena. Finally, all instruments integrated into the conducted research are based on self-reporting methods. For key research concepts, such as the effectiveness of virtual teams, it was found earlier that the self-reporting method is the most relevant indicator of the actual effectiveness of virtual teams [22]. However, the question arises as to whether self-reporting is the most relevant method for other research concepts, i.e. for trust in virtual teams or for knowledge sharing.

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EFFECTS OF THE EMPLOYEE'S JOB POSITION ON THE CORELATION BETWEEN JOB SATISFACTION AND PERSONALITY DIMENSIONS

Uticaj radne pozicije zaposlenih na korelaciju između zadovoljstva poslom i dimenzija ličnosti

Abstract

Job satisfaction represents an important predictor of achieving business success of an organization in contemporary business conditions. Hence, it is important to explore this construct, taking into account that the employees' personality dimensions influence their rating of job satisfaction. Moreover, the correlation between the dimensions of personality and job satisfaction may be also influenced by the employees' job position. Thus, the current study explores the effect of job position on the relation between personality traits and job satisfaction. The study sample consists of 116 employees of a public organization, operating in energy sector within Serbian transitional society. According to the research results, the employees' job position significantly shapes the relation between personality dimensions: neuroticism, conscientiousness and openness to new experiences and different facets of job satisfaction, such as supervision, relation with co-workers, benefits, pay and communication. The obtained results are expected to contribute to an improvement of human resource management practice within the transitional economies.

Keywords: *job satisfaction, personality dimensions, Big Five theory, job position, transitional economy*

Sažetak

Zadovoljstvo poslom predstavlja važan prediktor postizanja poslovnog uspeha organizacije u savremenim uslovima poslovanja. Stoga je važno istražiti ovaj konstrukt, uzimajući u obzir da dimenzije ličnosti zaposlenih mogu da utiču na nivo zadovoljstva poslom. Pored toga, na povezanost između dimenzija ličnosti i zadovoljstva poslom može uticati i radna pozicija zaposlenih. U skladu sa tim, ovo istraživanje je fokusirano na uticaj radne pozicije na odnos između dimenzija ličnosti i zadovoljstva poslom. Uzorak je obuhvatio 116 zaposlenih u organizaciji koja posluje u energetskom sektoru Srbije, tačnije u okviru tranzicionog društva. Prema rezultatima istraživanja, radna pozicija zaposlenih statistički značajno oblikuje odnos između dimenzija ličnosti: neurotičnost, savesnost i otvorenost za nova iskustva i različite aspekte zadovoljstva poslom, kao što su odnos sa nadređenima, odnos sa saradnicima, beneficije, plate i komunikacija. Očekuje se da će dobijeni rezultati doprineti poboljšanju prakse upravljanja ljudskim resursima u tranzicionim ekonomijama.

Ključne reči: *zadovoljstvo poslom, dimenzije ličnosti, teorija Velikih pet, radna pozicija, tranziciona ekonomija*

Introduction

In the contemporary business and conditions of global competitiveness, there is an overall necessity for adequate responses to the changes that are constantly occurring within the organizational environment [25], [31]. Changes conducted by the management at the organizational level cannot be implemented without the adjustments in managing the human resources [21], [28], [40]. Nowadays, employees, with their knowledge and creative skills, represent contemporary strategic resource for modern organizations, which puts emphasis on the need for researching the employees' job satisfaction as a predictor of achieving the successful business performances [2], [6], [9], [11], [13], [15], [16], [19], [24], [39].

The research conducted within the organizational environment, with the aim of determining the employees' job satisfaction, could reveal the necessary steps for improvement of organizational performances. The results of such study could point to the possible weaknesses in organizational operations, but they could also help in establishing the guidelines for eliminating the different causes of possible job dissatisfaction [13], [15], [39]. Such studies are particularly relevant for organizations in transitional societies, which face a series of transition-specific problems that are not typically evident within the organizations in countries with stable economic and political conditions [38].

The complexity of the job satisfaction studies is reflected in the fact that it is often related to different psychological theories, including the one termed as the theory of Big Five personality dimensions [17]. During the past decade, numerous authors focused their job satisfaction research on the influence of personality traits of the employees' [1], [7], [17], [18], [26], [34]. However, it is important to take into account that these constructs might be also shaped by different factors, such as the employees' job position.

Accordingly, this study was focused on exploring the personality dimensions and job satisfaction within an organization in Serbia, whose economy is characterized by the ongoing economic transition. Aim of the research was primarily oriented towards determining the relationship between the employees' personality dimensions and their job satisfaction, with exploring the effects of their job position on this relation. This study was conducted within a large public-owned organization that is operating in the energy sector, which is also expected to face significant changes in the future through reduction of the state interventionism, lowering of its monopolistic position on the market and possible future privatization, which may cause the feeling of job insecurity among the employees.

Furthermore, one of the basic problems within the organizations in transitional societies is insufficient knowledge in the field of human resource management (these organizational functions are mainly reduced and oriented towards the bureaucratic business tasks, without an adequate vision of developing this organizational sector), including the shortage of studies on the variables that determine the employees' job satisfaction and provide fruitful business conditions. Therefore, the main aim of this research is to explore the influence of employee's personality dimensions on their job satisfaction in the transitional society. Important goal is also to test the role of employees' job position on this relationship, with the aim of providing a database that would enable the improvement of human resource management within the country in transition, such as Serbia.

Literature review

Job Satisfaction

According to the definition that is used in majority of the literature dedicated to job satisfaction, this concept is related to pleasant and generally positive emotional state that is arising from the evaluation of the job or work experience [30]. One of the most prominent authors, focused on researching job satisfaction, Paul Spector [33], highlighted the different facets of job satisfaction: pay, promotion, supervision, benefits, rewards, operating conditions, relation with co-workers, nature of the work and communication. The same author also emphasized the three most important reasons for evaluation of the employees' job satisfaction. The first one implies that employees should be respected as individuals that could

contribute to general organizational success. The second reason is pointing to the fact that evaluation of the employees' job satisfaction could serve as an indicator of the business effectiveness among the employees. The third reason is related to the fact that job satisfaction of the employees might cause positive effects on general fulfilment of the organizational goals [33]. Different authors followed up with the studies on job satisfaction among the employees in different specific organizational environments [10], [22].

Personality Dimensions

One of the basic theories for researching the individual's personality is represented in the frames of the Big Five theory, which postulated the main dimensions of personality: extraversion, neuroticism, conscientiousness, agreeableness and openness to new experiences [5], [35]. The first dimension, *extraversion,* is characterized by sub-dimensions such as cheerfulness, cordiality, sociability and dominance of the empathy. In organizational environment, extraverts want to develop good relationships with the co-workers and they are also open for accepting challenging business tasks, if that will provide good relations with the managers [3]. Individuals with high *neuroticism* are focused on the negative aspects of the other people or different situations. This personality trait is typically characterized by several sub-dimensions, including the lack of emotional stability, feeling pressure, dissatisfaction and concern [29]. *Conscientiousness* is characterized by the following sub-dimensions: respecting the rules, systematic planning and performing the tasks, inflexibility and conformism. In organizational environment, individuals with high degree of this personality dimensions are responsible, self-disciplined and persistent [23]. *Agreeableness* is characteristic for individuals oriented towards establishment of closeness with other people, which is also of particular importance for working in a team. Such a person is sensitive and altruistic, but also expects to be treated in the same way [29]. Finally, an individual characterized by the *openness to new experiences* is creative and adaptive to different changes, so it could be said that these individuals are independent, efficient and curios [3], [23], [29].

Personality Dimensions and Job Satisfaction

Previous research suggests that personality dimensions could shape the employees' job satisfaction [1], [8], [18], [26], [34]. Employees are often pressured to act contrary to their personal characteristics and against their individual values, which may enable their progress in the organization, but very often at the expense of their job satisfaction. Also, if the employee's individual values are more liberal comparing to those represented within the organization, employees might consider that organization restricts their business potential, which might be also reflected in a decrease of job satisfaction. In case when personality dimensions are in line with the values promoted by the organization, their job satisfaction increases [4]. Hence, the balance between the employees' personality dimensions and the organizational job requirements could provide the environment where employees' skills and talents are utilized more efficiently. Therefore, one of the main tasks of the managers should be oriented towards meeting the needs of the employees' personality, in order to achieve their better commitment to performing various business tasks [4].

Job Position as a Predictor of Job Satisfaction

Factors that could influence an increase or decrease in job satisfaction might be related to the employees' job position [12], [14], [27], [37]. Results of the previous studies pointed out that managers have higher job satisfaction in comparison with those employed at the lower organizational levels. This finding is not surprising, since the managers usually have higher incomes, greater job security, greater freedom in performing their business tasks, including better working conditions. Besides that, previous findings indicated that job satisfaction could be increased by providing greater autonomy in performing business tasks and by ensuring conditions for gaining adequate balance between work and other daily responsibilities, which is more achievable for employees at the managerial positions [36].

Besides impacting job satisfaction, the employees' job position is known to correlate to their personality dimensions. Thus, [32] pointed out that job complexity at different job positions negatively affect the validity of

conscientiousness and emotional stability of the employees, while it positively affects the validity of their openness to new experiences.

Following up on these previously conducted studies, this research was oriented towards determination of the effects of the variable 'job position' on the correlation between the employees' personality dimensions according to the model of the Big Five and individual facets of their job satisfaction.

Methodology

Instrument

The questionnaire, constructed for the purpose of this research, was divided into three groups of questions. The first group of questions was related to the respondents' characteristics, with their job position being the most important for this research. The second group of questions was focused on the five personality dimensions: extraversion, neuroticism, conscientiousness, agreeableness and openness to new experiences. These personality dimensions were measured by the scale established by [20]. Third group of questions contained 36 items related to the respondents' attitudes on their job satisfaction and this scale was developed by Paul Spector [33]. Nine facets of job satisfaction were explored in the research, such as: pay, promotion, supervision, benefits, rewards, operating conditions, relation to co-workers, nature of the work and communication. The respondents expressed the degree of their agreement or disagreement with the statements in the questionnaire, on the basis of the 6-point Likert scale, from 1 (I completely disagree) to 6 (I completely agree).

Procedure

The research was conducted at the public-owned organization in Serbia in 2016. This energy-sector organization is operating in a small town, with the majority of inhabitants oriented towards this energy complex in terms of the citizens' employment. The respondents participated in the survey on a volunteer basis and they were informed that the research is completely anonymous. The questionnaires were distributed in person within the organization and the respondents expressed their attitudes on the research subject by using the standard pen–and–paper procedure. Collected data were analysed by using the Statistical Program for Social Sciences (SPSS 17.0). Statistical analyses were primarily focused on determining the effects of the employees' job position on the correlation between the personality dimensions and job satisfaction, as the main constructs of the research, while only significant differences are represented within the research results.

Sample

The total sample of the research consists of 116 respondents. According to their job position, 77.6% of the respondents were employed at the working level job positions (staff), while 22.4% of them were in managerial positions. Monopolistic position and bureaucratic organizational culture of the large public organizations in Serbia, including the one included in this study, created a specific organizational environment. As already mentioned, the majority of the citizens of the small town, where this organization is located, are employed within this organization. Thus, the upcoming organizational changes, in the form of privatization and possible job uncertainty, could shape the specific relation between the personality dimensions of the employees at the different organizational levels and their job satisfaction. The context of these forthcoming organizational changes could be particularly unsettling for the employees because job alternatives may be severely limited for those employed within this energy-sector organization.

Results

Mean and standard deviations for facets of job satisfaction and dimensions of personality are represented within the Table 1. Besides that, the research results represented within the Table 1 are indicating the values of Cronbach's alpha coefficients for all researched dimensions.

Furthermore, the research results presented in Table 2, are indicating that the correlation coefficient between the variables openness to new experiences and

the supervision facet of job satisfaction in the sub-sample of the employees in the managerial position is positive and significantly different from zero ($r = 0.445^*$, $p = .020$), which is not the case in the sub-sample of the employees in working level positions ($r = 0.000$, $p = .997$).

Furthermore, the correlation coefficient between the variables openness to new experiences and the co-workers' facet of job satisfaction in the sub-sample of the employees in the managerial position is positive and significantly different from zero ($r = 0.424^*$, $p = .027$), which is not the case in the sub-sample of the respondents employed in working level positions ($r = -0.068$, $p = .525$). These results are represented within the Table 3.

Further results reveal that the correlation coefficient between the variables conscientiousness and the co-workers' facet of job satisfaction (Table 4) in the sub-sample of the employees in the managerial position is positive and significantly different from zero ($r = 0.383^*$, $p = .048$), which is not the case in the sub-sample of those employed within the working level positions ($r = -0.108$, $p = .314$).

According to the research results represented within the Table 5, the correlation coefficient between the variables neuroticism and the co-workers' facet of job satisfaction in the sub-sample of the respondents employed within the managerial position is negative and significantly different from zero ($r = -0.381^*$, $p = .050$), which is not

Table 1: Descriptive statistics

Name	N	Minimum	Maximum	Mean	Std. Deviation	a
Pay	116	1.00	5.25	2.7086	.92109	.766
Promotion	116	1.25	4.75	2.9567	.82460	.757
Supervision	116	1.50	6.00	4.2887	.93342	.789
Fringe Benefits	116	1.00	5.25	2.8541	.87290	.762
Contingent Rewards	116	1.00	5.00	2.7599	.84391	.761
Operating Procedures	116	1.00	5.50	3.5609	.72756	.750
Coworkers	116	2.25	6.00	4.2737	.72530	.732
Nature of Work	116	1.25	6.00	3.9655	.92307	.778
Communication	116	1.00	6.00	3.2722	.98885	.791
Extraversion	116	2.40	7.00	5.5789	1.19319	.772
Openness to new experiences	116	2.00	7.00	5.4690	1.03448	.702 .859
Agreeableness	116	2.00	7.00	5.7595	1.10467	.780
Conscientiousness	116	2.00	7.00	6.1497	.89946	.806
Neuroticism	116	1.00	7.00	4.2289	1.27859	
	116					

Table 2: Correlation of the supervision facet of job satisfaction and openness to new experiences according to the employees' job position

		Managers		Staff	
		The supervision facet	Openness to new experiences	The supervision facet	Openness to new experiences
The supervision facet	Correlation	1	.445*	1	.000
	Significance		.020		.997
Openness to new experiences	Correlation	.445*	1	.000	1
	Significance	.020		.997	

Table 3: Correlation of the co-workers' facet of job satisfaction and openness to new experiences according to the employees' job position

		Managers		Staff	
		The co-workers' facet	Openness to new experiences	The co-workers' facet	Openness to new experiences
The co-workers' facet	Correlation	1	.424*	1	-.068
	Significance		.027		.525
Openness to new experiences	Correlation	.424*	1	-.068	1
	Significance	.027		.525	

the case in the sub-sample of the employees in working level positions (r = 0.187, p = .080).

The correlation coefficient between the variables openness to new experiences and the pay facet of job satisfaction (Table 6) in the sub-sample of the employees in working level positions is negative and significantly different from zero (r = -0.293**, p = .005), which is not the case in the sub-sample of those respondents employed within the managerial positions (r = -0.280, p = .158).

The research results also indicated that the correlation coefficient between the variables openness to new experiences and the benefits facet of job satisfaction (Table 7) in the sub-sample of the employees in working level positions is negative and significantly different from zero (r = -0.218*, p = .040), which is not the case in the sub-sample of the respondents employed within the managerial positions (r = -0.309, p = .117).

The correlation coefficient between the variables conscientiousness and the benefits facet of job satisfaction in the sub-sample of the employees in working level positions is negative and significantly different from zero (r = -0.321**, p = .002), which is not the case in the sub-sample of the respondents employed in managerial positions (r = -0.122, p = .546). These results are represented within the Table 8.

In addition, the correlation coefficient between the variables neuroticism and the benefits facet of job satisfaction in the sub-sample of the employees in working

Table 4: Correlation of the co-workers' facet of job satisfaction and conscientiousness according to the employees' job position

		Managers		Staff	
		The co-workers' facet	Conscientiousness	The co-workers' facet	Conscientiousness
The co-workers' facet	Correlation	1	.383*	1	-.108
	Significance		.048		.314
Conscientiousness	Correlation	.383*	1	-.108	1
	Significance	.048		.314	

Table 5: Correlation of the co-workers' facet of job satisfaction and neuroticism according to the employees' job position

		Managers		Staff	
		The co-workers' facet	Neuroticism	The co-workers' facet	Neuroticism
The co-workers' facet	Correlation	1	-.381*	1	.187
	Significance		.050		.080
Neuroticism	Correlation	-.381*	1	.187	1
	Significance	.050		.080	

Table 6: Correlation of the pay facet of job satisfaction and openness to new experiences according to the employees' job position

		Staff		Managers	
		The pay facet	Openness to new experiences	The pay facet	Openness to new experiences
The pay facet	Correlation	1	-.293**	1	-.280
	Significance		.005		.158
Openness to new experiences	Correlation	-.293**	1	-.280	1
	Significance	.005		.158	

Table 7: Correlation of the benefits facet of job satisfaction and openness to new experiences according to the employees' job position

		Staff		Managers	
		The benefits facet	Openness to new experiences	The benefits facet	Openness to new experiences
The benefits facet	Correlation	1	-.218*	1	-.309
	Significance		.040		.117
Openness to new experiences	Correlation	-.218*	1	-.309	1
	Significance	.040		.117	

level positions is positive and significantly different from zero (r = 0.297**, p = .005), which is not the case in the sub-sample of the respondents employed in managerial positions (r = -0.102, p = .613), which is represented within the Table 9.

Finally, the correlation coefficient between the variables neuroticism and the communication facet of job satisfaction (Table 10) in the sub-sample of the employees in working level positions is positive and significantly different from zero (r = 0.266*, p = .012), which is not the case in the sub-sample of the respondents in managerial positions (r = 0.087, p = .668).

Discussion

Openness to New Experiences and the Supervision Facet of Job Satisfaction

The sub-sample of the employees in managerial positions mostly contained the mid-level managers. Their ability to creatively approach to the problem-solving within the workplace, might secure them additional benefits, when they are recognized by the top management. This might increase the level of their satisfaction with relation to supervisors, which is the positive organizational outcome. On the other hand, also according to the research results of this study, the managers are not sufficiently responsive to the openness to new experiences by the subordinate employees, which could have a negative impact on creativity and innovation of the employees. This situation will not be possible in the future, as it is expected that the organization will have to become market-oriented with reduced financial support of the state. This will impose the need for synergistic effect of the total innovative capabilities of all employees.

Openness to New Experiences and the Co-Workers' Facet of Job Satisfaction

It is expected that the manager with this dimension of personality is ready to adopt new business ideas or suggestions of his co-workers, on the basis of well arguments.

Table 8: Correlation of the benefits facet of job satisfaction and conscientiousness according to the employees' job position

		Staff		Managers	
		The benefits facet	Conscientiousness	The benefits facet	Conscientiousness
The benefits facet	Correlation	1	-.321**	1	-.122
	Significance		.002		.546
Conscientiousness	Correlation	-.321**	1	-.122	1
	Significance	.002		.546	

Table 9: Correlation of the benefits facet of job satisfaction and neuroticism according to the employees' job position

		Staff		Managers	
		The benefits facet	Neuroticism	The benefits facet	Neuroticism
The benefits facet	Correlation	1	.297**	1	-.102
	Significance		.005		.613
Neuroticism	Correlation	.297**	1	-.102	1
	Significance	.005		.613	

Table 10: Correlation of the communication facet of job satisfaction and neuroticism according to the employees' job position

		Staff		Managers	
		The communication facet	Neuroticism	The communication facet	Neuroticism
The communication facet	Correlation	1	.266*	1	.087
	Significance		.012		.668
Neuroticism	Correlation	.266*	1	.087	1
	Significance	.012		.668	

This way of collaboration might establish good relations with the co-workers, which is considered as the positive organizational outcome. The lack of significantly positive correlation between the openness to new experiences and the co-workers facet of job satisfaction in the sub-sample of the staff employees could be an indication of a low level of teamwork in the researched organization. Hence, relations among the employees in this organization are not based on joint engagement in solving complex business tasks that require creativity, innovation and knowledge sharing. New organizational culture, which would also be based on the high presence of teamwork, would also contribute to greater cohesion among the employees, based on the awareness of the high degree of their interdependence in solving complex work tasks.

Conscientiousness and the Co-Workers' Facet of Job Satisfaction

The role of the middle management is important for successful performance of the organization, while the personality dimension labelled as the conscientiousness of the managers within the middle management level is perceived as a desirable and well respected feature (both among the subordinates and the top management). Thus, the manager with high conscientiousness serves as a role model for the employees, which is also a predictor of good interpersonal relations between the managers and the subordinate employees. The research results showed that there is no significant correlation between the conscientiousness among the employees in working level positions and their co-workers facet of job satisfaction. One of the reasons for such result might be the absence of the teamwork in this organization. Good interpersonal relations are in this situation usually based on the emotional aspect of these relations and not on the quality of cooperation in solving the business tasks. Conscientious employee thus might be perceived as a danger for the other employees. This employee might enjoy the support of the managers, but he/she could also serve as a benchmark for establishing the performance standards, which may cause the resentment in the case of non-conscientious employees toward conscientious employee.

Neuroticism and the Co-Workers' Facet of Job Satisfaction

High degree of neuroticism involves the presence of pressure and concern, which leads to an expectation that the managers with this dimension of personality can have impulsive reactions in relation to co-workers. If these reactions occur without a comprehensive analysis of the situation, they may cause the employees' dissatisfaction, especially if this reaction is unfair, according to the perception of the employees. Such a situation could lead to a strained relation between the managers and their subordinates, which could also be reflected in decreasing the quality of their interpersonal relations. Statistical results showed that increase in the level of neuroticism among the employees at working level positions did not cause significant change in the level of their co-worker's facet of job satisfaction. The neuroticism of the employees at working level positions does not affect their relation with co-workers because this state-owned, monopolistic organization is characterized by the absence of interdependence of the job performance at the staff level due to the absence of teamwork, as previously discussed.

Openness to New Experiences and the Pay Facet of Job Satisfaction

Among the managers within the middle management level in the researched organization, an increase in a degree of openness to new experiences was not followed by significant change in the pay facet of the job satisfaction. Managers in this organization have relatively high salary, consisted of the fixed part related to their education degree and a functional bonus. If the managers from this organization compare their salaries with those of the managers from the privatized organizations, they will notice that in privatized organizations, with all of the creative efforts required by the market game, the managers at the same organizational level cannot earn the personal incomes such as theirs. Accordingly, the level of the respondents' pay facet of job satisfaction within this research might be under the influence of that fact that could also mitigate their dissatisfaction

with the pay facet that is not adequately correlated with their business performance, innovation and creativity. Furthermore, employees at working level positions in the researched organization do not have a lot of opportunities for increasing the salaries based on their creative contributions. The pay facet of job satisfaction was researched on the basis of evaluating the different items, including the following one: "There are the opportunities for increasing the salaries within my job position" so the employees within the lower organizational level expressed low satisfaction with their salary.

Openness to New Experiences and the Benefits Facet of Job Satisfaction

The explanation is analogous to the previous one, since the managers have numerous benefits (for example, the ability to use the official vehicles, go on business travels etc.) that are not available to the employees in non-managerial positions. These employees at the lower organizational level realize that the only chance for gaining additional benefits may be through valorising their work contributions. However, when these expectations fail, an increase in openness to new experiences leads to a decrease in the benefits facet of job satisfaction. This dissatisfaction may be also enhanced through their perception that managers have various benefits, even if they do not express creativity and innovation, but a high level of loyalty to the top management.

Conscientiousness and the Benefits Facet of Job Satisfaction

Employees in managerial positions already have numerous benefits just due to their positions in organization, as already discussed, so the correlation between the personality dimension labelled as conscientiousness and their benefits facet of job satisfaction is not significant. An increase of this personality dimension among the employees in non-managerial positions is followed by a decrease in the benefits facet of job satisfaction, which points to such distribution of the benefits that does not adequately value the contribution of the employees to the overall success of the organization.

Neuroticism and the Benefits Facet of Job Satisfaction

In the sub-sample of the employees at the non-managerial positions, an increase in neuroticism is followed by an increase in the benefits facet of job satisfaction, which is not the case with the employees in the managerial position. Employees with a high degree of neuroticism are insecure (one of the items evaluated for this personality dimension) and they do not have high expectations of the benefits. It is expected that the employees with high degree of neuroticism even consider that they do not deserve benefits, which might be one of the possible explanations for their high level of satisfaction with this dimension of the job. On the other hand, managers with high level of neuroticism, despite insecurity, believe that they deserve the benefits they already have, just due to their higher level position in the organization, which reflects in the non-significant correlation.

Neuroticism and the Communication Facet of Job Satisfaction

Among the employees in non-managerial positions, an increase in neuroticism is followed by an increase in their communication facet of job satisfaction, indicating their satisfaction with the level of communication with co-workers. It could be said that this organization practices such organizational climate where relations between the employees become more personal. At the time of organizational changes, support from the co-workers and good interpersonal communication is important for reducing the pressure, particularly characteristic for the employees with a high degree of neuroticism. Besides that, typical characteristic of the employees with this dimension of personality is the presence of stress and fear about the future job uncertainty, which could make them prone to retreat into themselves and not express their problems transparently, in order to avoid the possible conflicts. Hence, as they avoid conflict situations with co-workers their communication is not strained and regarded as positive. On the other hand, managers with this type of dimension of personality do not exhibit significant correlation with the communication facet of job satisfaction, possibly due

to the fact that their higher level position inevitably leads to occasional confrontation with co-workers, which lowers their rating of this facet of job satisfaction.

Conclusion

In the environment of high job uncertainty, within the researched organization, the employees' job satisfaction is heavily influenced by the fact that employees are not rewarded through the evaluation of their real business performance, but mostly based on their position and education level. This business environment is also characterized by the absence of teamwork. Thus, it would be highly beneficial if the organizational culture was changed into one that would foster creativity and innovativeness of the employees. Such organizational culture should also strongly encourage teamwork, which would lead to greater cohesion among the employees. This would also enhance the awareness of the employees about the high level of their interdependence in solving the complex business tasks.

In case of the selection process for the manager positions, it is highly advisable to assess the personality dimensions of the candidates, in addition to their expertise and organizational skills. Thus, a high degree of neuroticism could be an obstacle in establishing good co-operation between the managers and their employees, leading to low job satisfaction and loss of personnel. Therefore, the top management should pay significant consideration to the aspects of the candidate's personality, especially among the candidates for the managerial positions, even in case of their excellent business performance indicators. Finally, it is highly important to establish an organizational culture which would nurture a reward system (including the pay and different benefits facets) that would stimulate the innovativeness and creativity of the employees within different organizational levels, in order to instigate successful business performances.

Finally, as this study was limited to the case study research of one big company in Serbia, the results should be generalized with caution. The results give some new insights that should be further tested on the companies of different sizes and types. Moreover, the future research should include employees of companies from other, similar, transitional economies in order to obtain larger, more diverse study sample. Also, the future research is to consider the effects of other variables on the relationship between job satisfaction and personality traits (such as gender, age, education, culture, working experience etc.).

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LOGISTICS SYSTEM AS A FACTOR OF BUSINESS DEVELOPMENT: THE CASE OF THE REPUBLIC OF SERBIA

Logistički sistem kao faktor razvoja poslovanja – primer Republike Srbije

Abstract

Logistics is becoming one of the most important sectors of the economy and an indispensable element in the process of international trade and industrial development. The aim of this paper is to examine the role and importance of logistics system in improving the performance of companies in different industries and to identify its key dimensions that need to be improved in order to create a favorable business environment within a given economy. The logistics system is observed through two dimensions- "hard", which refers to the elements of physical infrastructure, and "soft" which includes segments related to logistics services and customs procedures. The research was conducted on a sample of 298 companies in the Republic of Serbia. The research methodology includes factor analysis based on which, the positive impact of the logistics system on the selected performance of companies has been proven. In addition, the difference in the importance of certain elements of logistics system between manufacturing and non-manufacturing companies has been proven. The results of the research can be of particular use for policy makers, as an instrument for improving the overall business environment through the development of individual logistics subsystems. Also, this evidence allows better insight for individual companies into the effects of different segments of logistics on business development, according to the industry.

Keywords: *logistics, physical infrastructure, logistics services, business environment, company performance*

Sažetak

Logistika postaje jedan od najvažnijih sektora privrede i neizostavan element u procesu međunarodne trgovine i industrijskog razvoja. Cilj rada jeste da ispita ulogu i značaj sistema logistike u unapređenju performansi preduzeća u različitim granama industrije, kako bi se identifikovale njene ključne dimenzije koje je potrebno unaprediti radi stvaranja povoljnog poslovnog ambijenta u okviru date privrede. Sistem logistike posmatra se kroz dve dimenzije- "tvrdu", koja se odnosi na elemente fizičke infrastrukture, i "meku", koja uključuje segmente vezane za logističke usluge i carinske procedure. Istraživanje je sprovedeno na uzorku od 298 kompanija na teritoriji Republike Srbije. Metodologija istraživanja uključuje faktorsku analizu na osnovu koje je dokazan pozitivan uticaj sistema logistike na odabrane performanse preduzeća. Pored toga, dokazana je i razlika u važnosti određenih elemenata sistema logistike između proizvodnih i neproizvodnih preduzeća. Rezultati sprovedenog istraživanja mogu naročito koristiti kreatorima ekonomske politike, kao instrument u unapređenju ukupnog poslovnog ambijenta kroz razvoj pojedinačnih podsistema logistike. Takođe, navedeni dokazi omogućavaju individualnim preduzećima bolji uvid u efekte individualnih segmenata logistike na razvoj poslovanja, shodno pripadajućoj grani industrije.

Ključne reči: *logistika, fizička infrastruktura, logističke usluge, poslovno okruženje, performanse preduzeća*

Introduction

Logistics performance within an economy plays an important role in different economic and industrial development areas. Logistics can be defined as a part of a supply chain that plans, implements, and controls the efficiency of the flow of goods, services and information from a place of origin to a place of consumption [20]. The importance of those operations and the level of development of national logistics system in modern economies is becoming more pronounced, especially in the global environment and with increasing internationalization of business. Demands for continuous economic growth and development, improvement of competitive position, and intensification of international trade impose a satisfactory level of logistics performance within a country as an imperative. These requirements are also in line with individual goals of different companies, which may significantly depend on the level of development in this sector and its individual determinants.

In the context of individual industries and companies from different sectors, there is no or scarce evidence in the existing literature about the influence and importance of logistics systems and their elements for business development. For that reason, the subject of this paper is to examine the role and contribution of logistics in improving business performance in companies from various industries in the Republic of Serbia. The main goal is to determine the importance of this sector and differences in the needs for individual industries in the context of national logistics system. As a starting point in understanding the quality of this system and conceptualizing statements and research hypotheses, the framework for research methodology is taken from the Logistics Performance Index (LPI), published by the World Bank, which contains and explains key determinants of the logistics system. The division of logistics into the "hard" dimension, which refers to physical infrastructure, and "soft", which refers to service components [3], provides a basis for formulating the following research hypotheses:

H1: The quality of the logistics system has a positive impact on companies' performance.

H1a: The development of physical infrastructure has a positive impact on companies' performance.

H1b: The quality of logistics services has a positive impact on companies' performance.

The reason for individual formulation and separate testing for two segments of the logistics system is found in the evidence of their unequal importance [23]. Testing the degree of individual influence allows making conclusions about the need to improve certain dimensions within the national logistics system, where the overall sample can identify differences at the level of individual industries, which gives the reason to formulate the second hypothesis:

H2: The importance of logistics system components varies between companies within different industries.

H2a: The importance of physical infrastructure, as a component of logistics system, differs between manufacturing and non-manufacturing sector.

H2b: The importance of logistics services, as components of the logistics system, differs between manufacturing and non-manufacturing sector.

The structure of the article is as follows: after the introduction, the importance of logistics and its contribution to the development of various economic segments at a macro-economic level is presented, which provides a basis for examining the impact of logistics performance at the level of individual companies. After that, the level of development of logistics system in the Republic of Serbia is analyzed since the research was conducted in companies operating in this economy. The next part of the article presents the methodology of empirical research, followed by the presentation and discussion of the obtained results. In the end, concluding remarks are presented with given scientific and practical implications.

Importance of logistics for economic and business development

The existing literature provides ample evidence about importance of logistics at the level of overall economic and industrial development. The primary contribution of logistics system is reflected in its impact on increasing the intensity of international trade. The efficiency of countries' participation in global markets and international trade

initiatives [4], placement of industrial products, and smooth running of goods transport, significantly depend on the quality of logistics system and its continuous development [9]. Improving logistics performance can have different effects depending on the level of development of countries [6], especially affecting developing countries [20] and small open economies [30] where it leads to strong growth of foreign trade flows. Logistics operations have a significant impact on costs, time, reliability and complexity in performing import and export activities [11]. There is evidence of significant and positive impact of logistics on international trade intensification, which makes it one of the key non-tariff trade facilitation factors [14, 5]. Improving logistics performance also provides evidence of reducing the cost of the distance between countries [5], as a major obstacle in the process of international trade. In this way, the quality of the logistics system provides a basis for individual market players to achieve various goals related to improving business performance. A special challenge is the development of logistics systems in countries without direct access to maritime transport, as the most massive and cost-effective form of international trade [24]. These countries, including the Republic of Serbia, must find a way to improve their position for more efficient participation in international markets.

In the context of global economic competitiveness, according to the World Economic Forum [29], most economies are still far from satisfactory levels of competitiveness, which highlighted the need to find new patterns to improve the competitive position of countries and individual companies. The contribution to competitive advantage is recognized through the chance of logistics in reducing total costs, which can be a key factor in achieving various development goals, raising the level of national competitiveness and stimulating economic growth [7]. Logistics respects the relations between different economic sectors, providing a basis for economic activities related to the flow of goods, services, and information, where logistics activities contribute to reducing costs and raising the efficiency, which provides the potential for improvement in international environment and global supply chains [12]. Logistics also stands out as an important factor in making investment decisions and its quality has a positive effect on the inflow of foreign investment [19]. From the institutional point of view, political stability, quality of infrastructure, application of modern technology, level of education, and quality of available labor force can be singled out as key determinants of logistics system development in the global environment [26]. The positive externalities and direct consequences of improvement in this sector have been identified through the regional development in various sectors, including tourism [16]. In the period of extraordinary circumstances and crisis conditions, the situation caused by the COVID-19 pandemic additionally emphasized the importance of all elements of global supply chains. Efficient logistics activities such as timely distribution and synchronization of operations, together with respect for various restrictions in the execution of activities and realistic assessment of costs and time, can greatly contribute to amortizing the negative consequences of the crisis [15]. Modern industries have to be considered in the context of international production and trade, where complexity is particularly pronounced in extraordinary circumstances such as the COVID-19 pandemic. This crisis has highlighted the need for countries to participate more effectively in global supply and value chains [17], with logistics as a key element in this process. The identified importance of logistics in different economic circumstances provides an opportunity to examine its contribution to business development within an economy.

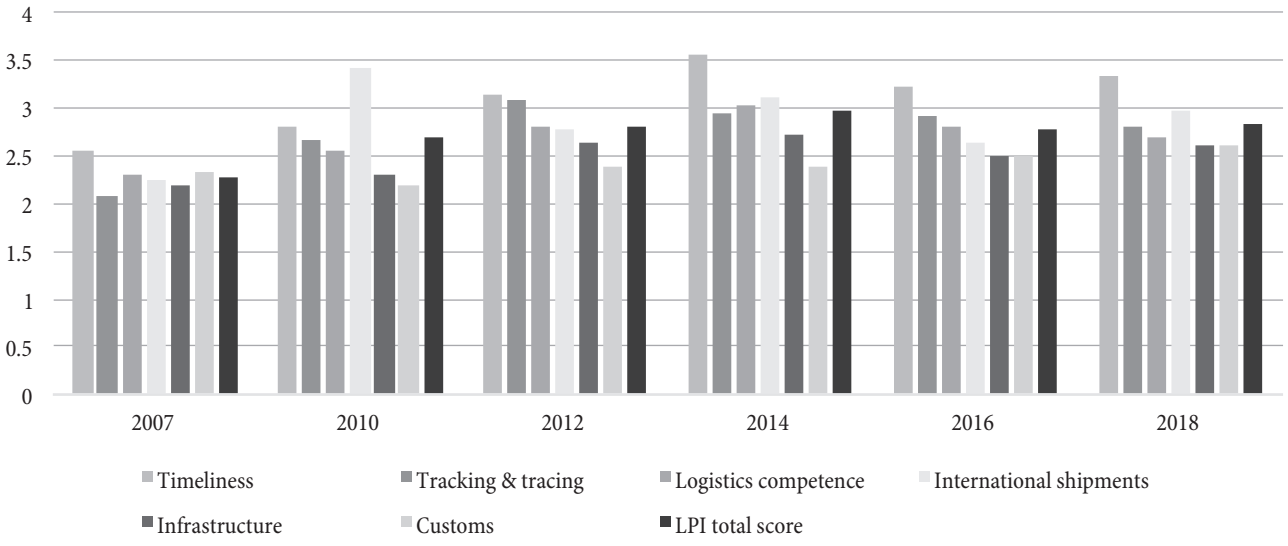
In the context of individual companies, logistics is increasingly perceived as a potential for change in business management, with key importance given to national logistics resources and competencies. The potential and quality of logistics performance could aid the efficiency of the operations and help companies in achieving the expected economic results in different markets [21]. The continuous growth of this sector is particularly important in developing countries as Western Balkans economies, where adequate planning, management, and control system is a key determinant of profitability in this [25] and other related sectors of the economy that depend more or less on the efficiency of logistics activities. The importance of logistics can also be identified in the current era of digitalization, where the application of modern technologies through the concept of Logistics 4.0

provides a basis for improving the efficiency of business activities, which consequently affects the development of the entire economy [18]. One of the key contributions of logistics from a microeconomic aspect is to increase the level of customer satisfaction based on the quality of logistics services [22], which could determine the success of companies from different industries, especially those that largely depend on distribution and transport systems. In addition, the development of logistics performance within an economy provides the basis for the realization of sustainable development goals and the practical implementation of green supply chain and development of revers logistics systems, which among other factors [13; 1; 2], requires appropriate infrastructure and service support within the national logistics system. This indicates the assumption that, in addition to identified contribution at the macroeconomic level, the logistics system provides strong potential for improving the business performance of individual companies from different industries within a particular economy.

Insight into the level of logistics system development in the Republic of Serbia

In order to assess the quality of the logistics system in the Republic of Serbia, an insight into the current level of development is expressed through the World Bank's LPI composite index (Chart 1). This index, published in 2007 for the first time, provides an assessment of logistics system quality, biannually, based on six components: customs, infrastructure, ease of arranging international shipments, quality and competence of logistics service providers, ability to track consignments, and timely delivery. Individual as well as overall assessment of these dimensions indicate the quality of logistics in an economy. The last available data is from 2018, where the LPI score for the Republic of Serbia

Figure 1: LPI scores for the Republic of Serbia for the time period 2007-2018



Source: Authors according to the World Bank report- *Logistics Performance Index* [28]

Table 1: LPI score and rank for selected countries in 2018

Country	LPI Rank	LPI Score	Customs	Infrastructure	Internat. shipments	Logistics competence	Tracking & tracing	Timeliness
Germany (Best performer)	1	4.20	4.09	4.37	3.86	4.31	4.24	4.39
Croatia	49	3.10	2.98	3.01	2.93	3.10	3.01	3.59
Serbia	65	2.84	2.60	2.60	2.97	2.70	2.79	3.33
Bosnia and Herzegovina	72	2.81	2.63	2.42	2.84	2.80	2.89	3.21
Montenegro	77	2.75	2.56	2.57	2.68	2.72	2.58	3.33
North Macedonia	81	2.70	2.45	2.47	2.84	2.74	2.64	3.03
Albania	88	2.66	2.35	2.29	2.82	2.56	2.67	3.20

Source: Authors according to the World Bank report- *Logistics Performance Index* [28]

is at the level of "partial performers", which indicates that there are significant logistics constraints and is in line with the results in lower and middle-income countries [3]. This fact indicates the need for further improvement, especially because of the potential impact of those components on companies from different kinds of industries.

The presented indicators can be compared with other countries, primarily in the Western Balkans region, in order to see the level of logistics performance development. Table 1 provides an insight into the score and rank for the best performer, as well as for other countries in the region, which according to the presented data have a lot of space for improvement in this area.

When it comes to the physical infrastructure component, which occupies special attention within the strategic goals and focuses of economic policy in developing countries, the assessment of this dimension can be further presented based on the infrastructure component within the Global Competitive Index [29]. Table 2 provides an insight into the level of development for various components of transport infrastructure in the Republic of Serbia.

Table 2: The assessment of transport infrastructure quality for the Republic of Serbia in 2019

	Score (0-100)	Rank/141
Infrastructure	73.8	51
Transport infrastructure	58.7	46
Road connectivity	84.5	43
Quality of road infrastructure	41.6	98
Efficiency of train services	26.8	82
Airport connectivity score	43.6	76
Efficiency of air transport services	55.3	88
Efficiency of seaport services	34.6	111

Source: *Global Competitiveness Report 2019* [29]

In the context of customs and other bureaucratic and service procedures related to export and import activities, which are integral "soft" elements of the logistics system, according to the latest World Bank report Trading across Borders [27], the Republic of Serbia, as an open and export-oriented economy, is ranked as 23rd according to the overall ranking of countries in assessing the efficiency and costs associated with the administrative activities of cross-border trade. Also, as additional part of "soft" dimension, specialized companies from logistics sector, 3PL and 4PL providers can have a significant impact on business development. Concerning LPI components, the possibilities and ease of organizing international shipments, as well as the competence of logistics providers, participation and the level of quality and availability of these services creates a more favorable environment for conducting logistics operations within an economy.

Empirical research methodology

The collection of primary data for empirical research and examination of presented assumptions was conducted during March and April 2022. The electronic on-line version of the questionnaire was handed over to the corresponding service department of the Serbian Chamber of Commerce, which subsequently forwarded the questionnaire to its members. The questionnaire was filled in by key informants in companies, who agreed to participate in the survey and fill in the questionnaire. It was specifically stated that the research is anonymous and that the collected data would be used exclusively for scientific purposes. In this way, a total of 298 valid questionnaires were collected.

The questionnaire was specially designed for this research and contains several parts. The first part defines the statements through which the respondents expressed their views on the quality of various determinants of the logistics system in the Republic of Serbia, including sharing their experience on the quality of physical infrastructure, customs procedures, and logistics services. The statements were formulated based on Logistics Performance Index (LPI) Questionnaire, which implies an assessment of "hard" and "soft" logistics components [3]. In addition, the statements are adapted to the subject and objectives of the research, as well as the language area in which the research was conducted.

The second part of the questionnaire is dedicated to assessing the performance of the company. The statements were formulated based on previous research conducted by Hartnell, Ou and Kinicki [10]. Similar to the previous one, the statements were adjusted and harmonized with the needs of the research. Finally, part of the questionnaire is dedicated to collecting demographic data on respondents (gender, age, education, etc.), as well as basic data on business operations (age, company size, industry within which it operates, etc.).

The sample includes companies that have an active foreign trade. Out of 298 collected questionnaires, 116 came from the managers of production companies. The rest of the sample consists of trade companies (21.14%), construction companies (10.4%), transport companies (9.06%), and companies engaged in other activities. In terms of size, micro and small companies predominate (43.29%), followed by medium-sized (33.9%), and the rest of the sample consists of large companies with over 250 employees (22.81%). Out of the total number of surveyed companies, as many as 235 of them have been operating on the market for more than 10 years. The sample is dominated by domestic private companies (75.17%), while the rest are foreign (17.79%) and state-owned companies (7.04%).

Results and discussion

Several latent variables were created for the research purpose. First, physical infrastructure as a component of logistics system includes all forms of transport, communication, and warehousing infrastructure. The second component refers to logistics services that include the efficiency and quality of customs procedures, conditions for implementation of various forms of transport, export and import operations, as well as the competence and quality of logistics service providers. Finally, the performance of the company refers to monitoring not only the financial, but also the operational effectiveness of observed companies. The conducted factor analysis singled out certain statements that are grouped into given factors, which created the basis for further

Table 3: Reliability analysis

Variables	ID	Statements	Cronbach's alpha
Hard	4.	***My experience so far shows that Republic of Serbia has…*** … high quality of transport infrastructure.	.913
	5.	… provided conditions for efficient realization of river transport.	
	6.	… provided conditions for efficient realization of road transport.	
	7.	… provided conditions for efficient realization of railway transport.	
	8.	… developed information and communication technology for the implementation of logistics activities.	
	9.	… developed network of warehouses and distribution centers.	
	30.	… rarely/almost never faces delivery delays due to storage inefficiencies.	
	31.	… rarely/almost never faces delivery delays due to inadequate transport infrastructure.	
	32.	… rarely/almost never faces delivery delays due to inadequate connections with port centers and inefficient intramodal transport.	
Soft	1.	… efficiency of the customs procedure at a high level.	.925
	2.	… high transparency of the customs procedure.	
	12.	… transport operators which are very competent to provide logistics services.	
	24.	***In our practice so far …*** … the import takes place without any difficulties.	
	25.	… the import of goods is always done as planned.	
	26.	… the export takes place without any difficulties.	
	27.	… the export of goods is always done as planned.	
	33.	… rarely/almost never face delays in delivery due to criminal activities.	
	34.	… rarely/almost never face problems in paying for logistics activities.	
	36.	… there is a possibility to choose the location for customs clearance.	
Company performance	61.	Our company is able to reduce operating costs.	.918
	62.	Our company is ready to increase exports.	
	63.	Growth/stability of our company's revenue is better than the competitors'.	
	64.	Opportunities to increase the number of clients are great.	
	65.	Opportunities for conquering new markets are great.	
	66.	Opportunities for revenue growth are great.	
	67.	The productivity of employees in our company is better than that of competitors.	
	68.	The level of profitability of our company is better than that of competitors.	
	69.	The sales volume of our company is higher than that of competitors.	
	70.	Employees of our company on average have higher salaries than employees in our main competitors.	
	71.	We can invest more in fixed assets and working capital than our competitors.	

Source: Output from SPSS

analysis (selected statements are shown within Table 3). Since the variables were created, a reliability analysis was performed using Cronbach's alpha coefficient, with values above 0.7, indicating their high reliability [8]. Based on Cronbach's alpha coefficient ranges from 0.913 to 0.925, it can be concluded that there is high reliability between the statements covered by the given variables (Table 3).

In order to test hypotheses H1a and H1b, multiple regression analysis was conducted by testing the impact of physical infrastructure development and the quality of logistics services, as a component of logistics system (independent variables), on companies' performance (dependent variable). The value of R square parameter is 0.194, which means that changes in values of dependent variable were explained in 19.4% of cases by changes in values of independent variables. The F statistic for a given regression model is 35.463 and is statistically significant at a level less than 0.001. The value of VIF indicator is less than 5, which shows that there is no problem of multicollinearity. Based on obtained results presented in Table 4, it can be concluded that there is a positive statistically significant impact of both components of logistics system on companies' performance, with a stronger impact identified in the case of "soft" component. Thus, hypothesis H1 is confirmed.

Table 4: Results of the multiple regression analysis

Independent variables	β	t	sig.
Physical infrastructure	.198	2.272	.024
Logistics services	.265	3.042	.003

R^2 = 0.194; F = 35.463 (p=.000)
Source: Output from SPSS

In the next step, the H2 hypothesis was tested, and the results of t-test for two independent samples were presented. In this way, it was tested whether there is a statistically significant difference in terms of the importance of logistics system components between manufacturing and non-manufacturing companies in the sample. First, differences were found in terms of statements regarding the importance of physical infrastructure in the analyzed companies. According to the values presented in Table 5, it was proved that there is a statistically significant difference in some statements related to the importance of physical infrastructure when comparing manufacturing and non-manufacturing companies, so hypothesis H2a is partially confirmed.

Table 5: T test results for two independent samples (physical infrastructure)

State-ments	Manufacturing companies M (SD)	Non-manufacturing companies M (SD)	t value	sig.
4	3.2672 (0.83778)	3.3352 (0.97639)	-.618	.035*
5	2.7845 (0.93999)	2.9286 (1.01391)	-1.230	.894
6	3.7069 (0.80236)	3.6044 (0.99033)	.936	.012*
7	2.7500 (1.06220)	2.8352 (1.12984)	-.649	.723
8	3.4828 (0.93700)	3.4725 (1.04950)	.085	.180
9	3.5776 (0.89589)	3.6044 (1.04991)	-.227	.040*
30	3.6552 (1.05586)	3.2912 (1.16952)	2.719	.171
31	3.5948 (1.10318)	3.2033 (1.21564)	2.809	.422
32	3.3707 (0.99153)	3.1429 (1.10320)	1.807	.627

* Values statistically significant at the level 0.05; M- mean; SD – standard deviation
Source: Output from SPSS

Similar to the previous one, Table 6 presents the results of t-test when it comes to logistics services as a component of logistics system. A comparison of arithmetic means for manufacturing and non-manufacturing companies was performed, and it was determined that there is a statistically significant difference in the case of individual statements. A statistically significant difference shows that the greater importance of observed components was identified in manufacturing companies. Due to the identified difference only in some of individual statements, it can be concluded that hypothesis H2b is partially confirmed.

Table 6: T test results for two independent samples (logistics services)

State-ments	Manufacturing companies M (SD)	Non-manufacturing companies M (SD)	t value	sig.
1	3.6466 (0.90654)	3.3516 (1.03394)	2.516	.239
2	3.6034 (0.94067)	3.3681 (1.09830)	1.905	.068*
12	3.8017 (0.83635)	3.5275 (0.95583)	2.533	.037**
24	3.5517 (1.12168)	3.3187 (1.06038)	1.809	.417
25	3.5000 (1.03420)	3.2582 (1.14396)	1.846	.273
26	3.7328 (1.05795)	3.3901 (1.12063)	2.630	.177
27	3.7414 (1.02253)	3.4286 (1.10391)	2.454	.094*
33	4.0345 (1.06265)	3.7198 (1.12900)	2.400	.148
34	4.0259 (0.91804)	3.6703 (1.05699)	2.977	.013**
36	3.9483 (0.95867)	3.6758 (1.10717)	2.180	.055*

** Values statistically significant at the level 0.05. * Values statistically significant at the level 0.1; M- mean; SD – standard deviation
Source: Output from SPSS

Confirmation of H1 hypothesis indicates the unambiguous importance of logistics system for individual business development, which confirms the statistically significant

and positive impact of both observed dimensions of logistics performance. Hypothesis H2, with its partial confirmation, imposes a conclusion on different importance of logistics system for certain sectors in the economy. According to the above statements, there are some differences in the importance of individual segments of logistics system between manufacturing and non-manufacturing companies.

Research implications, limtations and further lines of research

Given the identified growing importance of logistics for all segments of industrial and overall economic development, a specific analysis of logistics impact on selected business performance provides the necessary evidence on the manner and level of impact of this sector on the relevant sample of 298 companies in the Republic of Serbia. The research represents a unique step forward and a new direction of research in the scientific literature, which, through the connection between the macroeconomic environment and the needs of individual companies, provides practical and theoretical implications in this area. Earlier considerations have proven the positive impact of logistics in intensifying the process of international trade, improving the competitiveness of countries, raising the living standards of the population, as well as in mitigating and eliminating the consequences of economic shocks and crises. Also, the ubiquity of logistics operations in most modern companies emphasizes the logistics system as one of the key elements in national economies. The conducted research can serve as a valid basis in theoretical terms for the treatment of logistics systems as one of the key determinants in improving the economic environment and business development. In this way, the isolated subsystems of logistics can be treated in a practical sense as a basis for realization of economic goals aimed at business development within a particular economy.

The concept of the research and the obtained results can serve for future research aimed at combining macro and micro aspects. Despite the size of the observed sample, the survey was conducted only within one national economy which is the main paper limitation. Also, chosen research methodology is factor analysis and t test, but the sample size allows valid implementation of different methodologies in order to conduct further research. Therefore, the directions for future research can focus on examining the role of logistics systems in other economies, which would be a continuation of the initial idea of identifying the importance of logistics for business and overall economic development. Another recommendation is to provide a more detailed analysis by surveying a number of companies in different sectors, based on which conclusions would be drawn on the contribution of logistics systems and subsystems in particular industries.

Conclusion

The paper analysis distinguishes two dimensions of logistics, where it has been proven that the improvement of both "hard" and "soft" dimensions have a positive impact on companies' performance. The "soft" component shows a greater impact on business success, and as a valid conclusion, based on the identified statements within this dimension, we could report the need for efforts to raise the quality of logistics services in the Republic of Serbia, including customs procedures, which can contribute to raising the quality of the business environment in the country. At the same time, the continuous development of various components of physical infrastructure make an additional contribution to improving the domestic business environment. Confirmation of the first assumption gives theoretical implications that the system of national logistics with both its dimensions can be adequately treated as an important factor in business development within the national economy. The practical contribution is reflected in the specific recommendations for economic policymakers, and the focus on improving this sector of the economy can be treated as an independent instrument of economic policy. The practical connotation from companies' point of view is the ability to assess a particular business environment based on the quality and impact of logistics system, with identified differences in individual components between manufacturing and non-manufacturing companies. According to particular statements, in the case of physical infrastructure, the quality of transport, primarily road infrastructure, as well as the quality of warehouses and distribution centers, show a

statistically significant difference between manufacturing and non-manufacturing companies. In logistics services, a statistically significant difference was identified in transparency of customs procedures, competence of logistics operators, fulfillment of defined plan for export operations, as well as in the reliability of payment, and the possibility of choosing a location for customs clearance. All statements related to logistics services show a higher value of arithmetic means for manufacturing companies. In a general conclusion, it can be stated that both dimensions of the logistics system favor the development of companies' performance. This indicates the justification of attention that should be paid to improving various logistics components. At the same time, the exact contribution to observed industries can be established based on identified differences in individual statements.

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ARE CRYPTOCURRENCIES A SUSTAINABLE ALTERNATIVE TO TRADITIONAL CURRENCIES?

Da li su kriptovalute održiva alternativa tradicionalnim valutama?

Abstract

The great economic crisis has shown that the global financial system primarily protects those who are „too big to fail". In order to provide the common man at least a partial liberation from the hegemony of this bureaucratized and undemocratic system, Bitcoin was created, the first cryptocurrency that functions in a decentralized monetary system based on the blockchain. The emergence of cryptocurrencies, which are beyond the control of the traditional political and economic structures, has raised hopes that the world monetary system can be democratized and freed from the influence of inefficient regulatory institutions. This paper analyzes how realistic the scenario is that in the foreseeable future cryptocurrencies will prevail over traditional currencies, starting from the basic characteristics of cryptocurrencies, regulation of their accounting and tax status, mutual influence of monetary policy and cryptocurrency system, potential benefits that cryptocurrencies can offer to developing countries, as well as a summary of the advantages and disadvantages of cryptocurrencies and recommendations for their improvement.

Keywords: *cryptocurrencies, blockchain, bitcoin, traditional currencies, digital banking*

Sažetak

Velika ekonomska kriza je pokazala da globalni finansijski sistem prevashodno štiti one koji su „preveliki da bi propali". Da bi se običnom čoveku omogućilo bar delimično oslobađanje od hegemonije ovog birokratizovanog i nedemokratskog sistema, kreiran je Bitcoin, prva kriptovaluta, koji funkcioniše u decentralizovanom monetarnom sistemu, baziranom na blockchainu. Pojava kriptovaluta koje su van kontrole tradicionalnih političko-ekonomskih struktura, pobudilo je nadu da se svetski monetarni sistem može demokratizovati i osloboditi od uticaja neefikasnih regulatornih institucija. U ovom radu analiziraćemo koliko je realan scenario da u doglednoj budućnosti kriptovalute prevladaju u odnosu na tradicionalne valute, polazeći od osnovnih karakteristika kriptovaluta, regulisanja njihovog računovodstvenog i poreskog statusa, međusobnog uticaja monetarne politike i kriptovalutnog sistema, potencijalnih koristi koje kriptovalute mogu ponuditi zemljama u razvoju, kao i sumarnog pregleda prednosti i nedostataka kriptovaluta i preporuka za njihovo unapređenje.

Ključne reči: *kriptovalute, blokčejn, bitkoin, tradicionalne valute, digitalno bankarstvo*

Introduction

Throughout history, the entities that possessed exceptional political, social and economic power have had the right to issue money and manage the monetary system. Individuals who ruled certain territories proved their sovereignty, among other things, by minting their own money and imposing its use as a basic means of payment [22]. Although there are opinions that the first forms of the means of payment were determined and accepted spontaneously, in accordance with the existing needs and business conditions [36, p. 143], with the appearance of the first states and coins, this process ceased to be spontaneous and becomes strictly politically controlled. As a rule, the holder of control over the issue and cash flows had the greatest influence in every society, and in order to acquire and maintain such an important position, it was inevitable to engage in conflicts, political violence and bloodshed. One of the most important achievements of parliamentary democracy is the creation of an institutional environment in which the transition of political power and control over monetary flows is peaceful [23]. Therefore, due to the democratization of society individuals had been deprived of their monopoly over the management of the monetary system and monetary authority had been dispersed to the wider society. Thanks to the right to vote and participate in the election of the parliament members, who then directly control the monetary authorities, the citizens were given the opportunity to, although indirectly, influence monetary policy.

However, the global economic crisis that occurred in 2008 revealed the true state of affairs and called into question the democracy of the monetary policy process, even in the bastions of democracy such as the United States and the European Union. All the weaknesses of the financial and monetary system in countries of liberal economic provenance were shown, as well as the fact that most of the activities carried out during the crisis management process and its consequences were largely in favor of financial and political oligarchy, not the average citizen. The absence of democracy in the creation and implementation of monetary policy, the essential impotence of the citizens and the excessive discretion of the governing structures in making key decisions have become apparent.

It was this situation that motivated the creation of bitcoin, the first currency based on the blockchain system [41]. They are not created and controlled by the monetary authorities of any country [20, p. 3], but exclusively by participants in the blockchain, the so-called miners. Miners join the system and contribute to it by investing electricity and powerful software that solves complex algorithms [35, p. 29]. Within the system, they verify the realized transactions, without the possibility of changing and misusing the data in the records (ledgers) which are a confirmation of the existence of the transaction [3, p. 76]. In order to motivate individuals to participate in the system and take on the role of miners, the system provides them with a financial incentive in the form of commissions on realized transactions and bitcoins that they receive in the process of mining [20, p. 5]. Over time, according to the criteria by which miners' performance is evaluated and rewarded, two systems have emerged: proof-of-work (PoW), where miners are rewarded according to the computer power and electricity consumed, and on which bitcoin is based, and proof-of-stake (PoS), where miners are rewarded according to the number of coins they have [15, p. 38; 29, p. 93; 20, p. 6].

A decade after the creation of the first cryptocurrency, it is clear that this is not a one-time miracle, but an important phenomenon that must not be ignored. This is supported by the fact that today there are over 3000 cryptocurrencies in circulation, whose total market capitalization reached the value of 223.5 billion dollars, with a noticeable dominance of bitcoin (market share 66.5%), and daily turnover close to 56 billion dollars [10]. Cryptocurrencies are characterized by the fact that they are digital, privately issued, but not by public institutions, and enable decentralization of transaction execution [9, p. 3-4]. These characteristics of cryptocurrencies have made them attractive to a large number of citizens around the world who are left out of the existing banking system or the existing system does not suit them. These include those who [8, p. 1067]: do not have a current account and payment cards, live under totalitarian regimes that can easily take away their savings, live in countries with high

inflation and unstable currencies, want to develop and try technological innovations, and/or are involved in illegal business. The exceptional potential of cryptocurrencies is also recognized by countries which want to take advantage of the blockchain system and create their own cryptocurrencies[1]. For example, Sweden initiated the procedure of introducing its cryptocurrency e-Krona, Venezuela started the introduction of a cryptocurrency called Petro, which is supported by the natural resources that this country has at its disposal [this endeavor proved unsuccessful, in more detail 49, p. 146], while Japan planed to introduce the cryptocurrency J-coin during the Olympics in Tokyo in 2020 [45, p. 51-52]. Russia also considers following this practice. Namely, there is a plan to introduce CryptoRuble in order to neutralize the negative consequences of international sanctions and the dominance of the US dollar as the world's reserve currency [49, p. 146]. On the other hand, Argentina, as a country with long history of financial crises and economic instability, sees cryptocurrencies as a chance to stabilize its monetary flows and „democratize money" [38, p. 13].

The increasing importance of cryptocurrencies and the great expectations that a major part of the public has about them, opens numerous issues that should be addressed by the professional and regulatory public, such as legal and financial risks and security of participants in blockchain transactions and cryptocurrency users [5, p. 70]. Starting from that, in this paper we will analyze the process of regulating the use of cryptocurrencies, their accounting and tax categorization, conducting monetary policy in the conditions of cryptocurrencies, as well as the possibility of complete suppression of traditional currencies by cryptocurrencies in the foreseeable future.

Challenges of regulating the use of cryptocurrencies

Cryptocurrencies were developed as an alternative to conventional currencies in order to offer to the world a decentralized and democratic monetary system that would be controlled by the participants themselves through predefined protocols. In the cryptocurrency system, there is no regulatory entity that mediates transactions, monitors the system and prevents illegal activities [53]. Consequently, cryptocurrencies are often perceived as „anarchistic", which can be neutralized only by creating a crypto-banking system managed by a centralized administration [20, p. 14]. Regulatory issues related to the use of cryptocurrencies must be resolved in a systematic way, because otherwise the cryptocurrency system can very easily fail [51, p. 10]. The practice of legal regulation of cryptocurrencies varies in different countries, from a complete ban, through strict control of cryptocurrency dealers, to encouraging their use [25, p. 173]. Some of the key regulatory issues that need to be addressed are [48, p. 4]: presentation of cryptocurrency transactions in official financial statements, taxation of cryptocurrency transactions, and regulation of cryptocurrency dealer business.

The first dilemma to be addressed concerns the accounting treatment of cryptocurrencies. Current international accounting standards do not recognize cryptocurrencies, which is why it is necessary to supplement existing standards or, using an analogy, find an accounting category that is most similar to cryptocurrencies [46, p. 27]. Cryptocurrencies cannot be considered cash[2] because they are not sufficiently represented in purchase and sale transactions, nor can they be deposited in current accounts of banks; they cannot be considered intangible assets because they possess certain characteristics of financial instruments; considering that they offer their owner the possibility of making a capital gain, they can be classified in the category of investments [46, p. 27-28].

In the literature, we also find suggestions for posting cryptocurrency transactions. After excavation, cryptocurrencies can, in the amount of costs incurred in the process of mining, be recorded as assets in the balance sheet and unrealized gain in comprehensive income, while after their sale, revenues and expenses will be recorded within the income statement or net profit be separated

1 Government-issued cryptocurrencies do not satisfy the principle of decentralization, so they can be considered digitized government-issued currencies, rather than cryptocurrencies in the true sense of the word [31, 399].

2 Although at first glance they seem very similar to e-cash, cryptocurrencies still cannot be classified in this category due to the decentralization of the cryptocurrency system, a specific method of mining and anonymity [50, p. 5].

from the income statement and directly included in the liabilities of the balance sheet [46, p. 29-30]. Collection of receivables in cryptocurrencies is recorded by converting the received amount into the official currency at the exchange rate valid on the day of payment [50, p. 4].

The implementation of blockchain technology, on which cryptocurrencies are based, can also contribute to improving the efficiency of the accounting system. Potential benefits are primarily reflected in easier monitoring and verification of transactions, automated audit, simpler determination of property ownership, introduction of smart contracts and more transparent registers of all forms of assets [4, cited in 29, p. 96]. The application of smart contracts can lead to a reduction in the burden on the judicial system and a decrease in the transaction costs of concluding business contracts, due to the reduced need for third party mediation [14, p. 110]. However, it should not be forgotten that, unlike financial reporting, the blockchain is not only used to record transactions, but also within the blockchain is their realization [14, p. 109]. Also, given the extensive electricity and computer energy that needs to be consumed as a prerequisite for verifying transactions [20, p. 4], existing software solutions for tracking accounting transactions currently seem to be a better solution than blockchain [14, p. 109]. Efforts to categorize cryptocurrencies as accurately as possible are also aimed at regulating the taxation of cryptocurrency transactions. Considering that cryptocurrencies cannot be treated as traditional currencies, but rather as a form of property, this should be the starting point for their taxation issue [20, p. 10]. An important step in regulating the issue of taxation of the cryptocurrencies transactions was made by the European Court of Justice, which in 2015 exempted bitcoin transactions from value-added tax [16, p. 5, 7]. This step should encourage jurisdictions in all countries whose citizens use cryptocurrencies to regulate these transactions. Ignoring them would have extremely severe consequences in the form of creating a gray zone that provides perfect conditions for accounting and business fraud [46, p. 33].

The third regulatory challenge concerns the creation and implementation of monetary policy in the conditions of the existence of cryptocurrencies. The protocol according to which cryptocurrencies function prevents the conduct of active crypto-monetary policy because their offer is fixed [2, p. 8]. In addition, there is no mechanism for withdrawing cryptocurrencies from the market [27, p. 20], which central banks often use in conventional currencies in order to maintain their value. Also, cryptocurrencies are globally present and during their creation and use the needs of specific countries were not taken into account, nor the standards for creating an optimal currency zone, which further complicates the situation [9, p. 7]. These problems could be mitigated by changes in the algorithm by which cryptocurrencies operate, which would make the supply of cryptocurrencies flexible and in line with economic trends [42, p. 78; 9, p. 8]. Otherwise, in the period of economic growth, a fixed supply of cryptocurrencies would inevitably burden the economy with the problem of deflation [42, p. 78].

Although cryptocurrencies are not created by central banks, nor are they under their jurisdiction, this fact does not release central banks from the obligation to monitor movements in the cryptocurrency market and take appropriate measures accordingly. There are a number of valid reasons for this. First, the increased use of cryptocurrencies reduces the demand for conventional currencies, leading to two problems for monetary authorities [9, p. 9]: 1. control over monetary flows is reduced, which makes it difficult to conduct monetary policy efficiently, and 2. seigniorage revenue and, consequently, budget revenues are reduced, forcing governments to compensate for lost revenues by increasing taxes, which inevitably causes negative consequences for the economy. One of the consequences of reduced control over the money supply is the reduced possibility of influencing the movement of interest rates, which are now affected by both the supply of conventional ones and the supply of cryptocurrencies [45, p. 53]. Second, cryptocurrencies have far greater speculative potential than conventional currencies, so the bursting of the cryptocurrency bubble and the emergence of a crisis that can easily spill over into the conventional financial, but also into the real sector, are quite real options [9, p. 9].

It is evident that no security mechanism has been incorporated into the cryptocurrency system, such as deposit insurance or the existence of a credible lender of

last resort, which makes it very unstable and difficult to maintain in the long run [9, p. 10-11]. In addition, central banks and their management are responsible for their actions, while the cryptocurrency system does not have such an entity. This system is based on an algorithm that in case of system failure cannot be held accountable and which, no matter how complex and advanced it may seem, still does not meet the requirements of the modern financial system [9, p. 11]. However, despite the fact that central banks are not directly involved in the cryptocurrency system, their activities have a tremendous impact on the cryptocurrency market. Research has shown that changes in exchange rates, interest rates and quantitative easing have had a strong impact on the volatility of yields on cryptocurrencies, which shows that the cryptocurrency market is not immune to the activities of monetary authorities [13, p. 70-71]. It has been shown that in the period of increase of the reference interest rates by central banks, capital moves from the stock market and demand and yield on cryptocurrencies grow, while in the period of conducting expansive monetary policy the opposite trend occurs [43, p. 337]. The interconnection and conditionality of the cryptocurrency market and the traditional financial market is obvious and especially pronounced in countries with a greater presence and use of cryptocurrencies [33]. However, despite that, there is no consensus among the professional and regulatory public about the question of whether to include cryptocurrencies in the existing monetary system in order to facilitate their control or keep them out of the system [45, p. 34]. Regardless of the position of the regulatory authority, it is realistic to assume that the representation of cryptocurrencies will increase over time. Therefore, it is crucial to monetary authorities, with the support of national governments, get involved in the process of cryptocurrency development as soon as possible, so as not to become incapable of controlling the effects of cryptocurrency business and cryptocurrency market functioning [45, p. 53]. Otherwise, state and monetary authorities risk losing monetary control, the ability to stabilize macroeconomic trends and prevent sharp declines in economic activity in the foreseeable future [6, p. 19-21]. Finally, the possibility that the cryptocurrency system will disciplines central banks in order to become more committed to achieving the goal of price stability is not negligible, especially in the case of central banks that have a long history of failure in this field [9, p. 12].

The anonymity and decentralization of transactions with cryptocurrencies have opened up new opportunities for the free and efficient transfer of money and the realization of business transactions. Unfortunately, the monitoring difficulty of cryptocurrency transactions has been misused for money laundering and performing other illegal transactions [8, p. 1066; 54, p. 94]. Thanks to cryptocurrencies, Silk Road, an online drug market where thousands of dealers supplied millions of their clients, functioned very successfully [16, p. 4]. All this shows us that cryptocurrencies have an exceptional destabilizing potential, both for the economy and for society as a whole, so their perception as an experiment of marginal importance is a luxury that regulatory authorities cannot afford.

Possibilities of complete suppression of traditional currencies by cryptocurrencies

The great economic crises showed that the global financial system has an oligopolistic structure, with the dominant role of corporate financial giants being too-big-to-fail and triggering systemic banking crises through their speculative activities, which was one of the main motives for creating cryptocurrencies that work independently of the given system [51, p. 19]. The attractiveness of cryptocurrencies lies in the new opportunities and freedom that their users gain. They provide the possibility of anonymous realization of transactions, as well as use of money that is not managed by traditional political structures and which is globally usable and easily transferable, without endless legal procedures and obstacles [9, p. 4]. Thanks to advanced algorithms, the transfer of cryptocurrencies can be far cheaper, faster and more secure than the traditional currencies transfer, and, in addition, their owners are protected from arbitrariness or inefficient economic policy of the government of their country [8, p. 1065-1066). The absence of a highly bureaucratic structure in the cryptocurrency system and intermediaries in transactions enables the reduction of transaction costs and the realization of lower value transactions that are

not economically justified in the conventional monetary system [20, p. 2]. These benefits are especially important for mercants, who can make cheap, fast and secure money transfers around the world, without fear of being victims of fraud [54, p. 94; 2, p. 2]. This system also allows workers in foreign countries to transfer money to their families without complicated procedures and high commissions, as well as farmers in poor countries to receive money more easily after selling their products to foreign buyers [48, p. 5]. Additionally, in developing countries, the majority of the population does not have access to banking services, but has mobile phones[3], through which they can access the blockchain system and use the benefits of cryptocurrency transactions [16, p. 5].Thus, cryptocurrencies can be a solution for a large number of people living in unstable and corrupt countries[4] [1, p. 359]. These countries are often burdened by high inflation, which is in favor of the use of cryptocurrencies whose supply is mostly fixed, and thus are protected from inflation [16, p. 2; 54, p. 94], with the exception of cryptocurrencies based on the PoS system, which is not characterized by a fixed offer [20, p. 6].

Are these facts are strong enough arguments to declare cryptocurrencies legitimate means of payment and settlement, or even abandon the conventional monetary system and move to a cryptocurrency system? Friedrich Hayek believed that in an ideal currency system, currencies must be stable, contribute to the stability of economic movements, and there must be no state monopoly over the creation and management of currencies [in more detail 19, 106-116]. In the case of cryptocurrencies, the last condition is met. However, in order to cryptocurrencies be a viable alternative to traditional currencies, it is necessary that they be characterized by stable value, general acceptance and liquidity [24, p. 573]. Stable value and general acceptance, in the form of a wide range of users, are closely linked and mutually conditioned. In order to a certain currency be generally accepted, it is necessary for its value to be stable for a longer period of time, which is again conditioned by the existence of a sufficient number of users, i.e. demand that is in line with supply [9, p. 5]. The value of cryptocurrencies is very unstable[5], which is why there is no firm trust in them [16, p. 6] and, therefore, they are not used for everyday payments [24, p. 574]. For that reason, mercants do not keep them in their possession for a long time, but immediately convert them into stable traditional currencies [2, p. 2; 24, p. 576]. Their more active use would force mercants to constantly adjust prices due to frequent exchange rate changes, which shows that cryptocurrencies at this time can be as problematic to use as unstable currencies of developing countries [2, p. 2, 4]. The problem of variability in the value of cryptocurrencies cannot be significantly alleviated by creating a diversified portfolio of cryptocurrencies because the movements of returns on different cryptocurrencies are largely aligned, with the pronounced impact of Bitcoin returns on the return of other cryptocurrencies [21]. The pronounced variability in the value of cryptocurrencies can not only deter potential users from entering the cryptocurrency market, but also motivate existing ones to redirect their investments to traditional currencies, which would lead to their appreciation [47, p. 12].

The main reason for the more stable value and wider circle of users of traditional currencies is a system that stands behind them, which has been created over the centuries and it is based on strong, interconnected public and private institutions and states that provide them with legal basis and protection, which is not easy to overthrow [48, p. 3]. In the cryptocurrency system, there is no regulatory institution that would focus its activities on maintaining the stability of their value and amortize large value fluctuations that occur during a significant change in demand [2, p. 1]. An advanced algorithm and protocols are not enough to solve this problem, but the functioning

3 It should not be forgotten that even before the advent of cryptocurrencies, there were developed alternative, non-banking channels for money transfers and the provision of other financial services, which were also available to the population in developing countries. Therefore, although cryptocurrencies are a significant technological and financial innovation, they cannot be considered a pioneering endeavor in solving the problem of the availability of financial services to the population in the mentioned countries.

4 For this claim to be realized in practice, it is necessary to meet a number of conditions, which will be discussed in more detail later in the article.

5 Research [40] showed that the returns volatility of bitcoin (0.0461), measured with standard deviation, was ten times higher then the returns volatility of Euro (0.0046), Canadian Dollar (0.0046) and Swiss Franc (0.0044), eight times higher then the returns volatility of Australian Dollar (0.0056) and the Japanese Yen (0.0058), and more than seven times higher then the returns volatility of British Pound (0.0062).

of the cryptocurrency system is obviously necessary to regulate by defining its legal status, which would increase the legitimacy of cryptocurrencies, provide additional protection to their users and solve their taxation problem [20, p. 9-10]. Thus, the decentralized, debureaucratized and depoliticized system on which cryptocurrencies are based and because of which the public accepted them as hope for liberation from the constraints of the corrupt political-economic system, has become the main source of problems for cryptocurrencies themselves.

In addition, we should not forget that most people still do not know the system by which cryptocurrencies function [54, p. 94; 20, p. 12]. It is true that the level of knowledge of most people about the conventional monetary system is also low, but they are aware that the state is behind this system with its financial and political strength, which reduces the need for a high level of awareness that should precede the use of traditional currencies. On the other hand, there are many obscure and fraudulent Internet services that serve to manipulate insufficiently informed individuals and involve them in „pump-and-dump and Ponzi schemes" [44, 113243], which causes growing aversion to cryptocurrencies. Therefore, cryptocurrencies are perceived more as a speculative investment than as means of payment [20, p. 11; 54, p. 94]. Researches show that up to 90% of bitcoin transactions are speculative in nature [24, p. 575]. Also, they point to the high information efficiency of the cryptocurrency market, which immediately reacts to new information [30, p. 2287-2288].

According to researches, the value of cryptocurrencies in the initial stages of their development is dominated by speculative activities, while later, when the market stabilizes and matures, economic factors, such as the cost of their creation, take over the domination [32, p. 58]. These costs are mostly variable, such as the costs of electrical and computer power [27, p. 25]. Therefore, it is easy to conclude that cryptocurrencies have no intrinsic value [30, p. 2287]. Since they are not based on precious metals as traditional currencies used to be, nor is their value guaranteed by monetary authorities, which is the modern practice with traditional currencies, it is clear why the use of cryptocurrencies is still limited and why they are mostly used by speculators [9, p. 6]. For everyone else, doing business with cryptocurrencies is a real adventure. The conclusion of any contract involving long-term annuity payments or income expressed in cryptocurrencies, such as taking a long-term loan or buying a financial instrument that generates income expressed in cryptocurrencies, should be followed by complicated hedging operations to mitigate currency risk [2, p. 6].

The fact that the value of cryptocurrencies is unstable, due to insufficient trust of the general public and, therefore, a low level of acceptance, as well as strong speculative activity [51, p. 10] is particularly unfavorable for developing countries, which have seen cryptocurrencies as a way out of the current unenviable situation. This is not the only reason why cryptocurrencies are not currently a sustainable solution to the monetary problems of the mentioned countries. Namely, the efficient functioning of the blockchain requires a quality electricity and telecommunications infrastructure, which is not available to a large part of the population of developing countries, precisely those who would need cryptocurrencies the most [48, p. 7]. Second, even if the value of cryptocurrencies is stable and the ability to access the blockchain system is better, this „escape to the Internet" can be detrimental in the long run because it can serve as an excuse for the developing countries governments not to undertake the necessary radical reforms of their banking and economic systems [48, p. 8]. At the moment, cryptocurrencies cannot meet expectations and be a „safe haven" for the average resident of these countries from the adverse effects of geopolitical risks to which they are constantly exposed [11, 6]. In the current conditions, the real benefit of cryptocurrency in these countries would not have those who need it the most, but the wealthiest segment of the population, which has quality education, access to blockchain and enough money which needs to be extracted from the country [48, p. 8].

Given the numerous shortcomings of cryptocurrencies, at this point it is illusory to expect that in the foreseeable future bitcoin will succeed in overthrowing the US dollar from the throne of the world reserve currency. This can be rather expected from some other traditional currency, such as Chinese yuan [51, p. 33]. This role can hardly be taken over

by cryptocurrencies, even if the mentioned shortcomings are corrected. In order for a certain currency to acquire the status of the world reserve currency, it is necessary for its issuer to possess enormous political and economic power on the global level. All attempts and proposals to make the world's reserve currency supranational, which would prevent the monetary hegemony of any country, such as Keynes' Bancor [see 52], have ended in failure. The euro is one of the few relatively successful supranational monetary projects. However, it should not be forgotten that control over European monetary policy is not evenly dispersed to all EU members, but that Germany and its Bundesbank have a dominant role [see 52], which confirms the previously stated thesis.

Based on all the above-mentioned, it can be concluded that cryptocurrencies have not yet met key expectations. Instead to be P2P cash, whose creation is cheap and efficient, cryptocurrencies have become speculative assets created in an expensive and complex process [18, 177, 191]. Among their users, a minority are proponents of the existence of currencies exempt from state control, and majority are profit-seekers [34, 138], even classic gamblers[6]. In addition, the increasingly expensive process of the cryptocurrencies creating can lead to the hegemony of several mining firms and the imposition of high fees for cryptocurrency transactions [34, 141, 142]. The result of this process would be the centralization of the cryptocurrency system, thus losing the key difference compared to the conventional currency system.

However, these problems currently burden cryptocurrencies, and the low probability of suppressing traditional currencies [54, p. 94] must not be a reason for their rejection. They have tremendous potential to improve the quality of financial services and enable the safe and inexpensive transfer of money worldwide, unencumbered by inefficient administration and procedures. For the mentioned potential to be fully used, it is necessary to resolve several important issues. The first is the issue of control and regulation of cryptocurrency systems. Complete reliance on self-regulation has repeatedly proved unsuccessful in practice [17, 168]. On the other hand, applying the conventional approach to the regulation of cryptocurrency systems cannot bring valid results. Therefore, instead of direct and centralized regulation of cryptocurrency creators, it is more effective to apply decentralized regulation of cryptocurrency users, following their money transfers related to the purchase and sale of cryptocurrencies [39, 290]. However, government regulation must not hinder the creation of a conducive institutional environment for cryptocurrency ecosystems [24, 586]. It would be optimal to develop regulations in parallel with the cryptocurrency systems development [39, 291]. Also, given the global character of cryptocurrencies, regulatory standards should be defined at the international level [17, 170].

The second issue concerns the creation and conduct of crypto-monetary policy. Research shows that this important issue does not attract adequate attention from the academic public. Namely, of the total number of relevant surveys dealing with cryptocurrencies (18,000), only 1.57% (282) include the topic of monetary systems [12, 101]. In the mentioned research, the cryptocurrencies supply and demand management is mentioned as an important issue. Some authors believe that the supply of cryptocurrencies should be infinite and state that miners reward and mining cost are key factors that can be used to influence the miners behavior, the mining process and the stabilization of the market price of cryptocurrencies [in more detail 27]. On the other hand, in the conditions of fixed supply of cryptocurrencies, as a solution for more efficient management of the cryptocurrencies supply and demand is „the incorporation of 'crypto-banks' that would accept cryptocurrency deposits and issue 'convertible crypto-banknotes' through fractional reserves" [7, 21]. These, however, are still only theoretical solutions. In practice, cryptocurrencies are still burdened with numerous shortcomings. As long as these shortcomings are not remedied, cryptocurrencies will be usable only in economies burdened by high inflation, while in other cases the joint use of traditional and cryptocurrencies will have a detrimental effect on economic trends [28, p. 35]. In the literature, we find the characteristics that cryptocurrencies must have in order to their use be successful [26, p. 10-11]: unlimited supply, price adjusted to the marginal costs of their production, permanent assessment of marginal costs

6 Researches show that cryptocurrency trading is strongly associated with gambling addiction [37, 139].

by competitors and abandonment of cryptocurrencies with above-average production costs by miners, as well as the possibility of achieving an acceptable profit rate from arbitration based differences on spot and forward cryptocurrency prices.

Conclusion

During the decade of existence, cryptocurrencies have gone through a challenging development path from obscure attraction, exclusively understandable to IT experts and attractive to notorious gamblers, to a potential alternative to traditional currencies, strictly controlled by political and economic elites. A cryptocurrency system based on the peer-to-peer principle is perceived as a debureaucratized, democratic monetary system, freed from the yoke imposed by corrupted authorities that govern the global financial system. Cryptocurrencies have provided hope that money transfers, after removing administrative barriers, slowing-down procedures and third-party interference, will become far faster, cheaper and more secure. This would give a great contribution to international trade and an opportunity for the population of developing countries to receive money (foreign currency remittances), manage their savings and save it from inflation and expropriation by local repressive authorities.

However, in order to cryptocurrencies fully meet such high expectations, it is necessary to resolve a number of issues that accompany their implementation. The accounting and tax status of cryptocurrencies should be defined first. The first steps in this area have already been taken by classifying cryptocurrencies as investments and exempting cryptocurrency transactions from VAT. Also, the cryptocurrency system is of interest to regulatory authorities because it provides favorable conditions for performing numerous illegal transactions, which remain out of sight of law enforcers.

The complete independence of the cryptocurrency system from the conventional financial flows and the moves of the monetary authorities, who watch over these flows, is a concept that can only have a foundation in theory. Practice has shown a strong interdependence and connection between the traditional and crypto-monetary systems. Monetary authorities must be aware that the cryptocurrency system has a huge potential to cause devastating financial crises, due to the lack of stabilizing mechanisms and regulatory authorities that should prevent or mitigate the effects of the crisis. In addition, the growing use of cryptocurrencies reduces the scope of monetary authorities' control over financial and economic flows, weakens the effects of applied monetary policy measures and the possibility of stabilizing economic developments. Therefore, it is necessary to include the cryptocurrency system in the conventional monetary system.

The pronounced volatility of cryptocurrency values makes it impossible to use them for everyday payments, borrowings or investments. Also, due to this shortcoming, cryptocurrencies cannot be a life-saving solution to the problem of unstable currencies and high inflation in developing countries, nor a valid competitor to the dollar in the fight for the place of the world's reserve currency. Decentralization and, according to economic conservatives, anarchy of the cryptocurrency system are the reasons why it was considered attractive and democratic. However, these are also increasingly emphasized as its main shortcomings and obstacles to cryptocurrencies stabilization and strengthening. Therefore, the creators of these systems must partially abandon the proclaimed ideals and subject the system to a process of conventional control and regulation. Obviously, it is a bitter pill that must be taken in order to keep the concept of cryptocurrency alive in practice and gain a wide user base. The popularization of cryptocurrencies and, consequently, the stabilization of their value will be influenced by the improvement of cryptocurrencies themselves, through the improvement of protocols, flexibility of supply, reduction of costs of their creation and more efficient authentication and realization of cryptocurrency transactions.

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MACROECONOMIC DETERMINANTS OF LOAN DEFAULT RATE IN BANKING SECTOR OF THE REPUBLIC OF SERBIA

Makroekonomske determinante stope neizmirenja kredita u bankarskom sektoru Republike Srbije

Abstract

In literature, there is inconsistent view of how the size of a company affects the level of credit risk. The aim of this research is to to determine whether the exposure to systemic risk increases with the size of the borrower. Empirical analysis of the time series of loan default rates, as dependent variable, on the one hand, and macroeconomic factors, as regressors, on the other hand, is based on the error correction model. Parallel to this, a panel data analysis was applied where panel units are defined at the level of the risk segment of the loan portfolio. Research results confirm that there is statistically significant impact of macroecnomic determinants on loan default rate in banking sector of Republic of Serbia. However, in the segment of small and medium-sized enterprises, the adjustment coefficient is not statistically significant. Along with this, in the short run, there is a statistically significant negative impact of the one-quarter lagged default rate on the default rate in the SMEs segment. Based on the research results, it can be inferred that the credit risk of the SMEs segment is the most resistant to the influence of macroeconomic factors. SME are the most flexible because they are not burdened by size, and on the other hand, they are not endangered as micro businesses by the risk of concentration of one large customer and weak negotiating position in relation to creditors and suppliers.

Keywords: *banks, default rate, cyclicality of credit risk*

Rezime

U literaturi postoji neusaglašen stav kako veličina korisnika kredita utiče na stepen izloženosti kreditnom riziku. Cilj ovog istraživanja je da utvrdi da li cikličnost kreditnog rizika raste sa porastom veličine korisnika kredita. U radu je primenjen model sa korekcijom ravnotežne greške gde vremenske serije stopa neizmirenja kredita predstavljaju zavisnu promenljivu, a makroekonomski faktori nezavisne promenljive. Podaci su organizovani u formi panela gde su jedinice panela definisane na nivou segmenata kreditnog portfolija. Rezultati istraživanja potvrđuju da postoji statistički značajan uticaj makroekonomskih faktora na stopu neizmirenja kredita u bankarskom sektoru Srbije. U segmentu malih i srednjih preduzeća, koeficijent prilagođavanja nije statistički značajan. Pored toga, u ovom segmentu, u kratkom roku, postoji statistički značajan inverzan uticaj stope neizmirenja kredita sa docnjom od jednog kvartala na sopstvenu vrednost u tekućem kvartalu. Na osnovu ovih rezultata možemo da zaključimo da je kreditni rizik u segmentu malih i srednjih preduzeća najotporniji na uticaj makroekonomskih faktora. SME segment je najfleksibilniji jer nije opterećen veličinom i sa druge strane nije ugrožen kao segment mikro pravnih lica rizikom koncentracije jednog kupca i slabom pregovaračkom moći u odnosu na kupce i dobavljače.

Ključne reči: *poslovne banke, stopa neizmirenja kredita, cikličnost kreditnog rizika*

Introduction

Lending to the private sector (corporate and retail) is the main channel of financial intermediation which is the basis of economic growth of developing countries, but also a source of systemic risk [12, p. 110; 3, p. 1]. The lower the level of development of the financial system, the higher the share and importance of lending activity in the balance sheets of commercial banks, as it is almost the only way to provide external sources of financing for business entities. In such an environment, the stability of the financial system of an economy is directly related to the level of credit risk which commercial banks are exposed to, based on their lending activity.

Modeling credit risk with the default rate has been addressed in a large number of studies by foreign authors, but they all analyze the impact of specific factors at the company level [1, pp. 589-609; 23, pp. 449-470; 26, pp. 109-131; 33, pp. 59-82; 31, pp. 101-124; 10, pp. 2899-2939; 25, pp. 5932-5944]. The initial theoretical basis for credit risk analysis at the aggregate level is a model based on the portfolio evaluation (Credit Portfolio View – CPV model), developed by Thomas Wilson [34, pp. 111-117; 35, pp. 56-61]. Unlike previous models of the probability of default at the company level, in the CPV model, the aggregate default rate is for the first time modeled at the level of all industries in the USA, introducing macroeconomic factors as determinants. On the other hand, the phenomenon of financial acceleration defined by Bernanke, Gertler, Gilchrist in 1999 [5, pp. 1341–1393] was the theoretical basis for the introduction of the business cycle as one of the explanatory variables of credit risk at the aggregate level.

Irrespective of the objectively better performance of the default rate as a credit risk indicator compared to NPLs, a relatively small number of papers dealing with macroeconomic modeling of bond default rates [16, pp. 233-250; 27, pp. 28-44] and loan default rates [6, pp. 281-299; 7, pp. 219-235; 19, pp. 533-552; 11, pp. 1-19; 15, pp. 96-120] was produced after the global crisis. The reason for this is the lack of a loan default rate database at the national and international levels. Looking at the existing literature, it can be said that most countries do not have a loan default database, hence it was not possible to compare the results obtained between developing and highly developed countries. Keijsers et al. [19, pp. 533-552] in their research paper use, for the first time, the Global Credit Data[1] database formed in 2004 by 11 banks, which in 2017 counted 53 members. It was created as a result of international cooperation of banks, with a view to supporting econometric research, particularly when it comes to the implementation and improvement of regulatory framework for determining the required capital level – Advanced Internal Rating Based Approach (A-IRB approach) within the Basel II standard.

At the end of 2019, the Association of Serbian Banks, at the initiative of the largest Serbian banks, formed a national loan default rate database. It contains data at the aggregate level and by individual segments, starting from the first quarter of 2012.

The annual default rate is calculated as follows:

$$DR = N_T^D / N_{T\text{-}12m} \quad (1.1)$$

where:
DR – default rate,

N_T^D - number of borrowers / exposure amount as of date (T-12) in default at the date T, and

$N_{T\text{-}12m}$ - borrowers/ exposure amount not in default at the date (T-12m).

The aim of this study was to determine whether there is a statistically significant difference in credit risk cyclicality with an increase in the size of the borrower. There are various inferences in the literature about the impact of a company size on the default rate. In Keijsers et al. [19, pp. 533-552] it was confirmed that there is a greater variability in the default rate and loss given default in small and medium-sized enterprises compared to large companies. This conclusion was confirmed in the following papers: Shumway [31, pp. 101-124], Bunn et al. [9, pp. 1-37], Carvalho et al. [11, pp. 1-19]. In contrast thereto, the study by Bonfim [6, pp. 281–299] found that with the increase in the size of the company, the probability of default increases. There is no explicit position in the literature, however, it is implied that with the increase in a company's size, the default rate is largely determined by macroeconomic determinants,

1 www.globalcreditdata.org

while with the decrease in company size, the influence of specific factors increases [4, pp. 1-15].

Literature Review

Bunn et al. (2003) [9, pp. 1-37] examine the impact of corporate financial position indicators and macroeconomic indicators on the default rate in the UK over the period from 1991 through 2001. The sample consists of 105,687 observations from 29,361 companies that were included in the analysis in the said period. Probit model was used in this research. The company size has also been found to be a statistically significant factor in default 0probability; hence large companies have the lowest PD.

Liou et al. [21, pp. 14-31] reported on the importance of including macroeconomic variables into default rate prediction models. Up until then, most of the models for forecasting default rates were based on specific factors, i.e., company financial performance ratios. Their research confirmed the statistically significant impact of GDP, retail price index, consumer price index, interest rate, industrial production index and stock exchange index on the default rate.

Bruneau et al. [7, pp. 219-235] use a large sample of accounting data of non-financial entities, in the period from 1991 through 2004, in order to quantify the mutual influence between macroeconomic shocks and corporate financial fragility. The VAR model was applied. The results showed that there is a mutual two-way statistically significant impact on both sides of the output gap on the default rate with a negative sign. The effects of shock last for several years, after which they disappear.

In Diane Bonfim's paper (2009) [6, pp. 281-299], the subject of research involves determinants of corporate default rates in Portugal. The determinants of the default rate were analyzed using the logit model. The highest default rate was recorded with micro businesses and large corporate clients, but it turned out that in companies with a similar financial structure the size was not a statistically significant factor in the default rate. It was found that there is a statistically significant impact, accompanied by high regression coefficients, when it comes to GDP growth (negative sign), lending activity growth rate (negative sign), lending interest rate (positive sign) and stock price variation (negative sign).

Giesecke et al. [16, pp. 233-250] quantify the impact of macroeconomic and financial factors on bond default rates, in the period from 1866 through 2008, based on annual data for the U.S. market. The study analyzes corporate bonds, i.e., nonfinancial bond issues. The research has shown that stock return, stock return volatility and GDP are the best predictors of the bond default rate. It was found that a 50% increase in stock return leads to a 0.58% increase in the bond default rate.

Atanasijević and Božović (2016) [2, pp. 228-250] examine the determinants of the corporate loan default rate (companies and entrepreneurs). The sample consists of corporate loans of a Serbian bank spanning the 2008-2012 period. The aim of the research is, first of all, to quantify the impact of the euro exchange rate against the Serbian dinar on the loan default status. A probit model was applied to panel data where panel units are defined according to the loan currency (euro-denominated loans and loans in Serbian dinars). Based on the obtained results it was concluded that the depreciation of the dinar has a statistically significant impact on the default status, regardless of whether the loan was approved in euros or in dinars (negative sign). The one-year lagged GDP growth rate has a statistically significant impact on the default status (negative sign). The research found no statistically significant impact of the company size on the likelihood of default.

Keijsers et al. [19, pp. 533-552] analyze the impact of macroeconomic factors (GDP, industrial production and unemployment rates) on the default rate and loss given default, in a period from 2003 to 2010. The authors applied the panel data analysis testing the impact of macroeconomic variables (GDP, industrial production and unemployment rate) on the default rate and loss given default, with panel units defined according to the company size and economic activities. It has been demonstrated that there is a statistically significant impact of macroeconomic factors on the default rate, that the level of credit risk in small and medium-sized enterprises is more sensitive to changes in the economic cycle and that borrowers from the financial and industrial production sectors are most

sensitive to changes in the economic cycle, when it comes to the default rate level. The lowest level of the default rate sensitivity to the changes in the economic cycle phases has been recorded in companies that manufacture fast moving consumer goods.

Carvalho et al. [11, pp. 1-19] model the default rate with macroeconomic parameters on a sample consisting of 11 European countries in the period from 2007 through 2017. This study focused on answering the questions as to whether macroeconomic factors affect the default rate, whether there is asymmetry in the results obtained across the sample countries and whether the loan default rate varies significantly within economic activities. In the data analysis, a logistic regression model with panel data was applied. To test the asymmetric impact of macroeconomic factors on the default rate, a dummy variable was introduced that takes the value 1 for countries that were faced with financial crisis in the observed period (Portugal, Italy, Ireland and Spain) and 0 for all other sample countries (Austria, Belgium, Finland, France, Germany, Luxembourg and the Netherlands). It was found that all macroeconomic determinants have statistically significant impact on the default rate, with GDP growth rate standing out in particular. However, there is a pronounced asymmetric impact among the countries in GDP growth phase when the decline in the default rate is more prevalent in developing countries, i.e., countries that are more vulnerable to the stronger impact of the crisis.

Applied Methodology

Panel Unit Root Tests

The Levin, Lin and Chu test [20, pp. 1-24] and Im, Pesaran and Shin test [17, pp. 53-74] are unit root tests most commonly used in panel data analysis. The LLC unit root test is calculated based on pooled data, while the IPS unit root test is obtained as an average of ADF statistics. The LLC unit root test is based on the assumption that the residuals are independent and evenly distributed so that the mean value is equal to zero with the variance σ_u^2 and $\rho_i = \rho$ for each i. The null hypothesis claims that $H_0 : \rho = 1$, which means that all series in the panel have a unit root, while the alternative hypothesis claims $H_0 : \rho < 1$, which means that all time series are stationary. As can be seen from the above, the LLC test is based on homogenous structure of all panel units, whereby the null hypothesis assumes that all observation units contain a unit root, while the alternative hypothesis assumes that all panel units are stationary. Restrictive assumptions on which the LLC unit root test was based on (homogeneity and independence of comparative data) influenced further development of unit root tests. The LLC unit root test assumes heterogeneity only in the intercept, while the IPS unit root test allows for heterogeneity in the intercept and in the regression coefficients across the units in the panel. Within the null hypothesis of the IPS unit root test, it is claimed that $H_0 : \rho_i = 1$, which means that all series in the panel have a unit root. The alternative hypothesis claims that $H_1 : \rho_i < 1$ for i =1,...,N_1 i $\rho_i = 1$ for i = $N_1 + 1$,…..,N. It follows from the above that the alternative hypothesis implies at least one panel unit is stationary (not necessarily all), which means that hypotheses testing is based on averaging of individual test statistics.

The IPS test has better performance compared to the LLC test, but there is still a drawback to it that by rejecting the null hypothesis, it is not known how many panel units have stationary properties. In the event of autocorrelation of random error, the IPS test still performs well under the condition that n and T are sufficiently large.

Panel Cointegration Tests

The *Kao test* is based on the assumption of homogeneity of cointegration vectors for all panel units [18, pp. 1-44]. The null hypothesis is based on the claim that a series of residuals from the estimated regression contains a unit root, while the alternative hypothesis assumes that the residuals are stationary. Testing is based on the use of five tests. Four tests are based on DF statistics, while one is based on the ADF statistics. The DF test variants differ depending on whether they include the assumption of strict regressor exogeneity. In order to remove autocorrelation between residuals, the model was extended using the ADF test.

Unlike the *Kao panel cointegration test*, the *Pedroni test* is based on the assumption of heterogeneous cointegration

vectors, which includes the possibility of heterogeneous individual effects for different panel units. This further means that the slope coefficients, fixed effects and linear trend can vary within panel units. Pedroni [27, pp. 653-670] suggested the use of seven cointegration statistics and derived appropriate asymptotic distributions. Four statistics relate to pooling the data along the within-dimension (panel cointegration statistics) and include the pooling of autoregressive coefficients across different panel units when checking the stationarity of estimated residuals. The three statistics are based on the pooling the data along the between-dimension (mean group cointegration statistics) and involve averaging of estimated coefficients for each observation unit. For both groups of tests, the null hypothesis is the same (1, i=1,…., N), but there is a difference in the formulation of the alternative hypothesis. The first group of tests is based on the assumption of homogeneity of the coefficients of estimated residuals (, i=1,….N), while the second group of tests includes the assumption of heterogeneity of autoregressive coefficients (, i=1,….N). The first group of tests is based on the use of the following statistics: non-parametric variance ratio statistics, two non-parametric statistics proposed by Phillip and Perron (1998), which are adapted to panel data (*)* and parametric ADF statistics. The second group of tests uses two modified non-parametric statistics (variants of Phillips-Perron test statistics) and ADF statistics. Each of the proposed seven statistics has an asymptotically normal distribution under conditions when T, N→ ∞.

Panel ARDL model

Panel ARDL model is a variant of the ARDL (p, q) model [28, pp. 1-24]:

$$\Delta Y_{it} = \Phi_i + \sum_{k=1}^{p} \gamma_{ij}\ \Delta Y_{i,t-j} + \sum_{k=0}^{q} \mu_{ij}\ \Delta X_{i,t-j} + \delta_{1ij}\ Y_{i,t-1} + \delta_{2ij} X_{i,t-1} + u_{it} \quad (1.2)$$

where $\delta_{1i} = -(1-\sum_{k=1}^{q} \lambda ij)$ $\delta_{2i} = \sum_{j=0}^{q} \omega im$ (1.3)

$$\gamma_{ij} = -\sum_{m=j+1}^{p} \lambda im \qquad \mu_{ij} = -\sum_{m=j+1}^{q} \omega im \quad (1.4)$$

where i=1,….N are panel units, t=1,….T are observation periods, Φ_i are fixed effects defined separately for each panel unit, ω_{ij} and λij are k x 1 vectors of explanatory variables and u_{it} is random error. The null hypothesis of no cointegration between variables in the model can be defined in the following way H_0: $\delta_{1i} = \delta_{2i} = 0$, in contrast to the alternative hypothesis claiming H_1: $\delta_{1i} \neq \delta_{2i} \neq 0$. An essentially null hypothesis claiming the absence of cointegration in the model can be defined as follows: H_0: $\omega_{ij} = 0$ in contrast to the alternative hypothesis H_1: $\omega_{ij} \neq 0$.

The next step, if the presence of cointegration is confirmed, the conditional ARDL long-run model for Yt can be presented as follows:

$$Y_{it} = \varphi_i + \sum_{k=1}^{p} \lambda ij\ Y_{i,t-j} + \sum_{k=0}^{q} \omega_{ij}\ X_{i,t-j} + \varepsilon_{it} \quad (1.5)$$

This requires determining of the number of lags in the ARDL (p, q) model using one of the information criteria (AIC, SBC or BIC). In the third step we define the short-run parameters of the error correction model:

$$\Delta Y_{it} = \alpha_i + \sum_{k=1}^{p} \gamma_{ij} \Delta Y_{i,t-j} + \sum_{k=0}^{q} \mu_{ij}\ \Delta X_{i,t-j} + \varphi_i ECM_{t-i} + u_{it} \quad (1.6)$$

where the random error (u_{it}) is independent, has a normal distribution with a zero mean value and a constant variance. ECM_{t-i} is the error term. φ is adjustment coefficient and shows the speed at which the dependent variable returns to the long-run equilibrium relationship path with the explanatory variables, after the effect of shock. Already based on the definition of the adjustment coefficient, it is clear the same should have a negative sign.

Methods for Estimating Heterogeneous Parameters

Pesaran et al. [28, pp. 621-634] were among the first authors to cover the heterogeneity of regression parameters in the dynamic panel models. The authors proposed the application of mean group (MG) method which involves the formation of individual equations for each panel unit estimated using OLS method to then form the average of the estimated parameters. On the other hand, pooled mean group (PMG) method constrains the long-run coefficients to be identical, while allows the constants, short-run coefficients and error variances to differ across panel units [29]. The allowed heterogeneity of the short-run coefficients affects the dynamic specification and provides the possibility of including different lags in regressions for different observation units. The PMG represents a middle-ground solution between the estimation of individual regressions, where all coefficients and error variances can vary across observation units, and traditional estimates of models with constant parameters. Unlike PMG, the

MG method does not assume heterogeneity of long-run coefficients across observation units. Using the Hausman test, a formal check is performed between the application of PMG and MG methods for estimating regression parameters. The null hypothesis of the Hausman test is based on the claim of homogeneity of the long-run coefficients. If the null hypothesis is adopted, the application of PMG method, which gives efficient and consistent estimates, has the advantage. If the null hypothesis of homogeneity of regression parameters in the long run is rejected, the PMG estimate becomes inconsistent and then the MG method should be applied, which provides consistent estimates under these conditions.

Data and Model Specifications

For the purposes of the research presented herein, two groups of data were used: (1) data on default rates and (2) macroeconomic data. The time series cover the period from 2012Q1 to 2018Q4, which means that the observation period consists of 28 observations at a quarterly level (t=28). As for the default rate (DR), we used data from the Association of Serbian Banks on the number of investments in default. In order to increase the number of observations in the sample and to test the homogeneity of regression parameters, a panel data analysis was applied. Panel units were formed according to the basic risk segments of the loan portfolio: default rates for loans extended to large corporate entities, default rates for loans extended to small and medium-sized enterprises, default rates for loans extended to individuals and default rates for loans extended to micro businesses. In this way, four panel units, i.e., four observation groups as basic components of the aggregate default rate, were obtained. The sample includes a total of 112 observations (N=112) obtained as the product of the time series length (t=28) and the number of panel units (n=4). Panel units were defined on the basis of the loan portfolio segmentation by main commercial segments, which correspond to four credit portfolio segments made based on borrower's size. Borrower's size is defined based on annaul sales turnover. The method applied for defining panel units made it possible to draw conclusions on the credit risk cyclicality at the level of the entire loan portfolio, but also to draw conclusions on the existence of heterogeneity in credit risk cyclicality among the basic risk segments of the loan portfolio. Particulars of the variables used in here presented research, as well as their abbreviations, are given in Table 1, below.

Due to the subject of the research and manner of defining panel units (main loan portfolio risk segments), we ran the regression on all panel units relative to the same time series of macroeconomic determinants. As result of this, dependent variable has two dimensions (within and between panels) while independent variables have only one dimension (within panels). Consequently, descriptive statistics of dependent variable are presented in two tables,

Table 1 Variable names and abbreviations

Number	Variable name	Abbreviation
1	Logistic transformation of the default rate (y_w) $DR_t = \ln\left(\frac{z}{1-y_t}\right)$	DR
2	Seasonally adjusted log GDP in millions of dinars	LGDP
3	Nominal log dinar-euro exchange rate	LER
4	Log key interest rate of the National Bank of Serbia	LKIR
5	Log risk premium of the Republic of Serbia measured by EMBI index (emerging market bond index prepared by JP Morgan)	LRP
6	Log year-on-year inflation rate	LCPI
7	Log seasonally adjusted real net earnings	LDRNS

Source: Author

Table 2 Descriptive statistics of the default rate with log transformation

Variable		Mean value	Standard deviation	Min	Max	Number of observations
DR	Total	-3.43164	0.54937	-4.79579	-2.27541	N=112
	Between		0.32700	-3.77275	-3.01260	n=4
	Within		0.46999	-4.87041	-2.38157	T=28

Source: Edited by the author based on the default rate database of the Association of Serbian Banks

in table 2 with two dimensions and in table 3 with only one dimension i.e. as per panel units. Descriptive statistics of macroeconomic factors are presented in table 3, below.

When it comes to logistic transformation of the default rate, already based on the standard deviation between panel units and within panel units, it is clear that the main source of the total variability is variability within panel units. This means that the differences between the panel units are not the source of the total variability. Based on this result, we can expect that the assumption of homogeneity of regression parameters between the panel units is met. In order to gain a better insight into the characteristics of the default rate as a variable of interest and the characteristics of the same, but observed across panel units, in Table 3 below, the default rate is shown in its original form, i.e., in % and without any previous transformation. The same table contains descriptive statistics of macroeconomic variables in original form, before log transformation. The highest variability in the default rate is recorded in the segments of large corporate entities and micro businesses, while the lowest variability exists in the segment of loans extended to individuals is in accordance with the above.

Based on the correlation matrix of first difference of macroeconomic determinants, at significance level of 0.05, it is clear that is no statistical significant correlation between macroeconomic determinants. Consequently, there will not be multicollinearity between regressors (see Table 4 below). In addition, the panel data carry more information, have greater variability, less collinearity between variables, more degrees of freedom and greater efficiency.

Based on the fact that ECM, derived from ARDL model, was applied, there is a possibility to lose of significant numbers of degrees of freedom in the model, depending of number of lags of dependent and independent variables in ARDL (p, q) model. For that reason, in order to avoid the loss of significant numbers of degrees of freedom, two models were formed to analyze the impact of macroeconomic factors on the default rate. The panel ARDL model was applied to determine whether there are short-run and long-run relationships between the default rate, on the one hand, and macroeconomic determinants, on the other. Based on the above, two formulas were developed for each of the models (long-run and short-run part of the model,

Table 3 Descriptive statistics of the default rate expressed in % and macroeconomic factors in original measures before log transformation

	Mean value	Standard deviation	Min	Max	Median	Skewness	Kurtosis	JB test	p
DRLC	3.95	2.33	0.81	9.05	3.29	0.880141	2.600822	3.79	0.15
DRSME	3.04	1.44	1.18	6.07	3.07	0.204658	1.842179	1.75	0.41
DRR	2.31	0.55	1.33	3.05	2.30	-0.117712	1.552406	2.50	0.28
DRM	4.99	1.85	2.55	9.31	4.98	0.416738	2.296195	1.38	0.49
GDP	864.811,4	37.143,99	815.349,0	935.749,3	853.620,2	0.658744	2.296742	2.60	0.27
ER	118.3288	3.61	111.3643	123.9679	118.4453	-0.168246	2.034748	1.21	0.54
KIR	6.67	3.112013	3.00	11.75	5.67	0.253654	1.423934	3.19	0.20
RP	2.92	1.392824	1.09	6.19	2.66	0.729016	2.749446	2.55	0.28
CPI*	3.48	3.30	0.30	12.20	2.15	1.616061	4.326772	14.24	0.00
DRNS	46,003.77	2,777.45	39,134.89	50,761.77	45,758.10	-0.379	2.822616	0.70	0.70

Length of the series: 2012 Q1-2018 Q4;*non-normal distribution
Source: Author's calculations.

Table 4 Correlation matrix of first difference of macroeconomic factors (significance level of 0.05)

	LGDP	LER	LKIR	LRP	LCPI	LDRNS
LGDP	1.0000					
LER	0.1109	1.0000				
LKIR	0.0324	-0.0612	1.0000			
LRP	0.3590	0.3513	-0.1479	1.0000		
LCPI	-0.2825	0.0855	0.2624	-0.0512	1.0000	
LDRNS	0.3771	0.1681	-0.0410	0.2136	-0.1751	1.0000

Source: Author's calculations.

respectively), which were estimated simultaneously and which are shown below.

Model 1

$$DR_{it} = \varphi_i + \sum_{k=1}^{p} \lambda ij^* DR_{i,t-j} + \sum_{k=0}^{q} \omega_{ij}^* LGDP_{t-j} + \sum_{k=0}^{q} \gamma_{ij}^* LER_{t-j} + \sum_{k=0}^{q} \mu_{ij}^* LRP_{t-j} + \varepsilon_{it} \quad (1.7)$$

$$\Delta DR_{it} = \alpha_i + \sum_{k=1}^{p} \lambda ij \Delta DR_{i,t-j} + \sum_{k=0}^{q} \omega_{ij} \Delta LGDP_{t-j} + \sum_{k=0}^{q} \gamma_{ij} \Delta LER_{t-j} + \sum_{k=0}^{q} \mu_{ij} \Delta LRP_{t-j} + \varphi_{ij} ECM_{t-1} + u_{it} \quad (1.8)$$

Model 2

$$DR_{it} = \varphi_i + \sum_{k=1}^{p} \lambda ij^* DR_{i,t-j} + \sum_{k=0}^{q} \omega_{ij}^* LKIR_{t-j} + \sum_{k=0}^{q} \gamma_{ij}^* LCPI_{t-j} + \sum_{k=0}^{q} \mu_{ij}^* LDRNS_{t-j} + \varepsilon_{it} \quad (1.9)$$

$$\Delta DR_{it} = \alpha_i + \sum_{k=1}^{p} \lambda ij \Delta DR_{i,t-j} + \sum_{k=0}^{q} \omega_{ij} \Delta LKIR_{t-j} + \sum_{k=0}^{q} \gamma_{ij} \Delta LCPI_{t-j} + \sum_{k=0}^{q} \mu_{ij} \Delta LDRNS_{t-j} + \varphi_{ij} ECM_{t-1} + u_{it} \quad (1.10)$$

Results

Tables 5 and Table 6 below display results of the stationary analysis of the dependent and independent variables in this research. Dependent variable has two dimensions, between panels and within panels thus LLC and IPS unit root tests, which represent first generation unit root tests in panel models, were applied. Both test results, LLC and IPS test, show that time series of dependent variable is integrated of order I(1). Independent variables haven't dimensions between panels thus ADF and modified ADF unit root tests have been implemented. Based on both test results, conclusion is that independent variables LGDP, LER, LKIR and LRP are integrated of order I(1). On the other hand, independent variables, LCPI and LDRNS are integrated of order I(0). Modified AFD test was implemented with time series that have structural break. Existence of structural break in observed period was tested by Chow test. Structural break has time series of LGDP (2014Q3), LER (2017Q1) and LCPI (2016Q2).

The *Kao test* and *Pedroni test* were applied to test the existence of cointegration in here presented panel models (the results of the tests applied are reported in Tables 7 and 8 below). Based on the results of the *Kao test* of cointegration, the conclusion on the existence of cointegration ($p<0.05$) was made in both models, while on the basis of the results of the Pedroni test, based on the two out of the three here observed statistics, the conclusion of the existence of cointegration can be made. Based on the results of both tests, we infer that there exists cointegration in both models and we proceed with further research.

Based on the fact that there is a difference in the order of integration of the variables of interest (I(0) and I(1)), the panel ARDL model was applied to determine whether there are short-run and long-run relationships between the default rate, on the one hand, and macroeconomic determinants, on the other hand. The Bayesian information criterion (BIC) was applied to obtain the optimal lag length in the ARDL model. As the sample size grows larger, this

Table 5 Unit root tests in panel models

	LLC (Levin, Lin & Chu) test		IPS (Im-Pesaran-Shin) test	
	Order	First difference	Order	First difference
DR	1.5861	-2.6132	1.4443	-4.6782

Source: Author's calculations

Table 6 Unit root tests for macroeconomic variables

	Modifikovan ADF test		Proširen Dickey-Fuler test (ADF test)			
	U nivou		U nivou		Prva diferenca	
Promenljive	t statistika	kritična vrednost	t statistika	kritična vrednost	t statistika	kritična vrednost
LGDP	-4.57	-4.85	-1.69	-3.58	-4.87	-2.98
LER	-3.26	-5.17	-1.27	-3.58	-5.25	-2.98
LKIR	/	/	-2.77	-3.60	-3.02	-2.98
LRP	/	/	-2.68	-3.58	-5.49	-2.98
LCPI	-5.51*	-5.17	-1.70	-3.58	-3.84	-2.98
LDRNS			-4.51**	-3.58		

Source: Author; *time series stationary at a level based on the ADF test adapted for time series with structural break;**time series stationary at a level based on the augmented Dickey-Fuller test

information criterion gives better results compared to other information criteria and is most often used in the panel data analysis. In model 1, the optimal number of lags in the ARDL model is (2,0,0,0), and in model 2 ARDL (1,0,1,0). In order to determine an adequate method for estimating heterogeneous parameters, i.e., to render the parameter estimates efficient and consistent, the Hausman test was applied. In both models, model 1 and model 2, based on the results of the Hausman test, the method of pooled mean groups was applied to estimate the model parameters. The test results are reported in Table 9 below. The rules of inference within the Hausman test and basic characteristics of the method for estimating heterogeneous parameters in the panel ARDL model are illustrated above under subsection Methodology.

The coefficients showing the long-run relationship in the panel ARDL model for both here defined models are shown in Table 10 below. Based on the obtained results, we infer that four out of six regressors total have a statistically significant impact in the long run on the default rate: seasonally adjusted GDP, nominal exchange rate, risk premium of Serbia and key policy rate. The direction of the impact of GDP, risk premium and key policy rate is in line with the results of prior research studies and in accordance with the economic logic. In the long run, the growth of GDP leads to a decline in the default rate, and the growth of the risk premium of Serbia and key interest rate leads to a rise in the default rate. The direction of the impact of nominal exchange rate on the default rate has a negative sign, which is not in line with the results of previous research. The result here obtained reveals that in the long run, the increases in nominal exchange rate (dinar depreciation) lead to a decline in the default rate. At first glance, the obtained result does not seem logical, but merely looking at the graphical representation of the series of the default rate calculated according to the

Table 7 Kao test and Pedroni test of cointegration - model 1

Model 1: DR=f(LGDP, LER, LRP)					
Kao cointegration test			Pedroni cointegration test		
Test	Statistics	p	Test	Statistics	p
Modified Dickey-Fuller test	-2.7603	0.00	Modified Phillips-Perron test	0.0242	0.49
Dickey-Fuller test	-2.5195	0.00	Phillips-Perron test	-3.6464	0.00
Augmented Dickey-Fuller test	-3.0399	0.00	Augmented Dickey-Fuller test	-1.5341	0.06
Unadjusted modified Dickey-Fuller test	-4.3201	0.00			
Unadjusted Dickey-Fuller test	-2.9830	0.00			

Source: Author's calculations.

Table 8 Kao test and Pedroni test of cointegration - model 2

Model 2: DR=f(LKIR, LCPI, LDRNS)					
Kao cointegration test			Pedroni cointegration test		
Test	Statistics	p	Test	Statistics	p
Modified Dickey-Fuller test	-5.78	0.00	Modified Phillip-Perron test	-1.21	0.11
Dickey-Fuller test	-3.80	0.00	Phillip-Perron test	-4.08	0.00
Augmented Dickey-Fuller test	-2.65	0.00	Augmented Dickey-Fuller test	-3.97	0.00
Unadjusted modified Dickey-Fuller test	-6.01	0.00			
Unadjusted Dickey-Fuller test	-3.84	0.00			

Source: Author's calculations.

Table 9 Results of the Hausman test for the panel ARDL model where the panel units are loan portfolio risk segments

		Test statistics	p value
	DR=f(LGDP, LER, LRP)		
Model 1	DFE vs. PMG	6.78	0.07
	PMG vs. MG	3.19	0.36
	DR=f(LKIR, LCPI, LDRNS)		
Model 2	DFE vs. PMG	0.06	0.99
	PMG vs. MG	0.26	0.96

Source: Author's calculations.

number of clients in default[2], on the one hand, and the series of the nominal exchange rate, on the other hand, it is evident that the said series have opposite direction of movement for most of the observed period (see Graph 1 below). The minimum amount of the nominal exchange rate series was recorded in 2013Q1 (111.96), when the aggregate default rate (DRT), retail default rate (DRR), small and medium-sized enterprises default rate (DRSME) and micro businesses default rate reached its maximum in 2013Q2 (3.11%), 2013Q2 (3.05%), 2013Q3 (5.20%) and 2012Q4(9.32%), respectively. This further means that in the period from 2013Q1 to 2017Q1 the nominal exchange rate increased, whereas all default rates mentioned recorded a fall. The inverse relationship between these variables, which is not in line with the economic logic, can be explained by the fact that the exchange rate in Serbia is subject to an intensive state intervention, being one of the most important channels of monetary policy due to a high degree of euroization of the Serbian economy. This further means that the price stability was achieved by the intervention of monetary authorities on the exchange rate [22, pp. 14-31]. In addition, the default rate is not cumulative as an indicator of nonperforming loans, and therefore, the impact of the said structural mismatch of the Serbian economy is pronounced even more so when it comes to the direction of the impact of the nominal exchange rate on the default rate. Atanasijević and Božović [2, p. 237] found the impact of the exchange rate, with a positive sign, on the default status to be statistically significant (1 - NPL loan; 0 – loan with regular payments), but the observation period does not coincide with the period covered herein. The authors spanned the 2008-2012 period, while the period here observed runs from 2012 through 2018. The period covered by Atanasijević and Božović [2, p. 232] is the period when the exchange rate was not in the focus of monetary authorities for achieving price stability, and that is one of the reasons behind the estimated difference in the direction of the impact of the exchange rate on the default rate. Moreover, the difference does not refer only to the observed period, but also to the method of calculating the default rate, because Atanasijević and Božović [2, p. 233] approximated the default rate through NPLs where the calculation method is cumulative. Further, it is not the first time in the literature that the negative impact of the exchange rate on the credit risk level was identified Zeman et al. [31, p. 11], which has been explained by the fact that the depreciation of a local currency tends to increase the competitiveness of domestic goods relative to foreign goods, which all depends on whether the observed country is a net exporter or importer. The stated explanation cannot be applied to the case of Serbia, because our country is a net importer. Finally, in this research default rate is on aggregate level, not on borrower's level, thus there is lot of factors than can have impact on relation between credit risk and nominal exchange rate, such as loan collateral and currency of the loan.

Based on the fact that the Hausman test determined that the method of pooled mean groups gives efficient and consistent estimates within the models defined here, it should be borne in mind that the application of this method allows for heterogeneity of parameters in the short-run part of the model across observation units, i.e., within the panel units.

In model 1, there is a statistically significant adjustment coefficient in the short run for all panel units (see Table 11 below), except for the SMEs segment. The adjustment coefficient varies between panel units from 29% (large corporate clients) to 76% and 78% (micro businesses and retail segment, respectively). In the segment of small and medium-sized enterprises, the adjustment coefficient is not statistically significant, thus we infer that there is no long-run adjustment in the SMEs default rate movement to the movement of the GDP, nominal exchange rate and risk premium of the Republic of Serbia. We can infer that credit risk in the segment of small and medium-sized enterprises is not cyclical in nature as in other three segments of the loan portfolio. Within the SMEs segment, in the short run, there is a statistically significant impact of the one-quarter lagged default rate on the default rate in this segment of the loan portfolio. The direction of the impact is negative, which means that the positive growth rate of the default rate in the previous quarter causes a negative growth rate of the default rate in the segment of small and medium-sized enterprises in the current

2 The default rate is expressed in %, in its original form, i.e., without any transformations.

quarter, and vice versa. Based on the research results, it can be inferred that the credit risk of the SMEs segment is the most resistant to the influence of macroeconomic factors. Evidently, there is an impact in the short run, but the direction of the impact of the default rate is inverse in the period up to a maximum of 3 quarters or 270 days, which can be explained by the fact that, if clients in this segment go into default, they, on the basis of various financial concessions (reprogramming, refinancing, etc.), recover rapidly and come out from the default status. We explained this by the fact that these companies are the most flexible because they are not burdened by size, and on the other hand, they are not endangered as micro businesses by the risk of concentration of one large customer and weak negotiating position in relation to creditors and suppliers. Božović got the same result in his research of loan default rate predictors for Serbian banking sector [8, pp. 22].

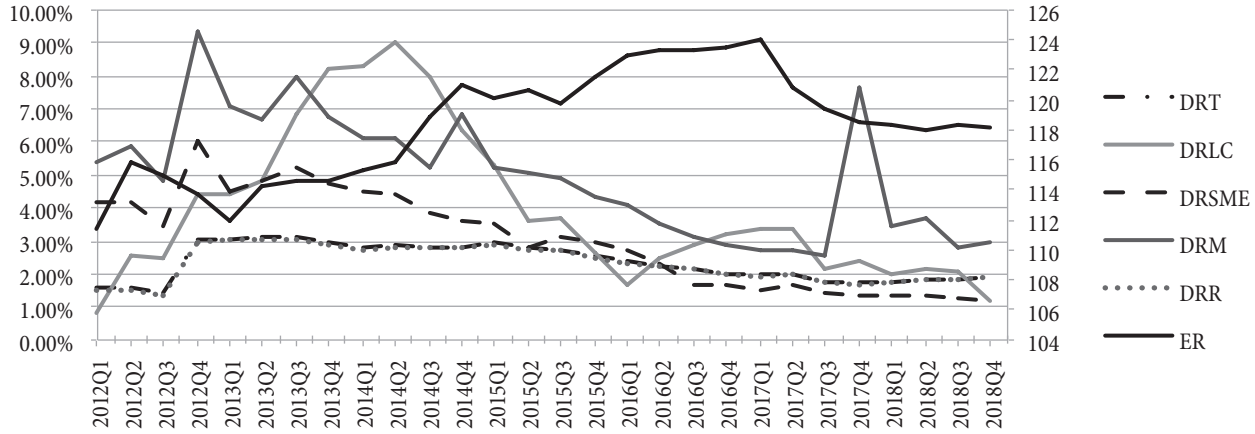
In model 2 (see Table 12 below), at the level of the panel units, adjustment coefficients in the segments of large corporate clients, small and medium-sized enterprises and individuals are found to be statistically significant in the short run. The adjustment coefficient is the highest in the corporate clients' segment (-0.36) and the lowest in the retail segment (-0.13). The adjustment coefficient in the micro businesses segment is not statistically significant. Based on the obtained results, we conclude that the default rates' movement in the long run in the segments of large corporate clients, small and medium-sized enterprises and individuals adjusts to the long-run equilibrium relationship with the key interest rate. Based on the value of the adjustment coefficient, we conclude that the default rate adjusts the fastest, i.e., in the shortest possible time, to the long-run equilibrium relationship with the key interest rate. In addition, we conclude that regardless of the homogeneity in the model parameters between panel units, there is also a statistically significant difference between panel units, when it comes to the impact of the key interest rate on the default rate across different risk segments of the loan portfolio. In the segments of large corporate clients, small and medium-sized enterprises

Table 10 Long-run regression coefficient in the panel ARDL model (model 1 and model 2)

	Variables	Coefficient	Standard error	t-Statistic	p value
Model 1	DR=f(LGDP, LER, LRP)				
	LGDP	-3.50	0.60	-5.76	0.00
	LER	-2.34	0.65	-3.6	0.00
	LRP	0.16	0.05	2.93	0.00
Model 2	DR=f(LKIR, LCPI, LDRNS)				
	LKIR	1.59	0.34	4.63	0.00
	LCPI	0.14	0.15	0.93	0.35
	LDRNS	5.04	3.25	1.55	0.12

Source: Author's calculations.

Graph 1 Aggregate default rate (DRT), retail default rate (DRR), micro businesses default rate (DRM), small and medium-sized enterprises default rate (DRSME) and large corporate entities default rate, left-hand scale, and nominal exchange rate, right-hand scale



Source: Author's calculations.

Table 11 Short-run regression coefficients in the panel ARDL model 1 (DR=f(LGDP, LER, LRP)) at the panel units level (panel units are at the level of loan portfolio risk segment)

Variables	Coefficient	Standard error	t-Statistic	p
Panel unit 1_default rate in large corporate segment (DRLC)				
ECT	-0.29*	0.12	-2.25	0.02
ΔDR_{t-1}	0.18	0.18	1.00	0.31
ΔDR_{t-2}	0.19	0.14	1.31	0.18
$\Delta LGDP_t$	-4.53	4.99	-0.91	0.36
ΔLER_t	0.65	4.61	0.14	0.88
ΔLRP_t	-0.26	0.30	-0.87	0.38
C	16.17*	7.80	2.07	0.03
Panel unit 2_default rate in SMEs segment (DRSME)				
ECT	0.04	0.12	0.36	0.71
ΔDR_{t-1}	-0.53*	0.22	-2.39	0.01
ΔDR_{t-2}	0.00	0.19	0.02	0.98
$\Delta LGDP_t$	0.78	3.11	0.25	0.80
ΔLER_t	-4.68	3.25	-1.44	0.15
ΔLRP_t	-0.08	0.18	-0.44	0.66
C	-2.48	6.71	-0.37	0.71
Panel unit 3_default rate in retail segment (DRR)				
ECT	-0.78*	0.06	-12.04	0.00
ΔDR_{t-1}	-0.11	0.07	-1.46	0.14
ΔDR_{t-2}	0.007	0.06	0.1	0.91
$\Delta LGDP_t$	1.13	1.06	1.06	0.28
ΔLER_t	-0.29	1.16	-0.25	0.80
ΔLRP_t	0.04	0.07	0.67	0.50
C	43.60*	7.18	6.07	0.00
Panel unit 4_default rate in micro businesses segment (DRM)				
ECT	-0.76*	0.32	-2.32	0.02
ΔDR_{t-1}	-0.08	0.31	-0.28	0.78
ΔDR_{t-2}	0.105	0.20	0.51	0.61
$\Delta LGDP_t$	2.13	6.04	0.35	0.72
ΔLER_t	0.02	5.47	0.00	0.99
ΔLRP_t	-0.10	0.34	-0.30	0.76
C	42.66*	19.71	2.16	0.03

Source: Author's calculations; *statistically significant coefficients (p<0.05)

Table 12 Short-run regression coefficients in the panel ARDL model 2 (DR=f (LKIR, LCPI, LDRNS)) at the panel units level

Variables	Coefficient	Standard error	t-Statistic	p
Panel unit 1_default rate in large corporate segment (DRLC)				
ECT	-0.36*	0.12	-2.96	0.00
ΔDR_{t-1}	-0.32*	0.15	-2.07	0.03
$\Delta LKIR_t$	0.73	0.83	0.88	0.37
$\Delta LCPI_t$	0.13	0.09	1.48	0.13
$\Delta LCPI_{t-1}$	-0.14	0.09	-1.61	0.10
$\Delta LDRNS_t$	1.49	1.55	0.96	0.33
C	-21.92	14.31	-1.53	0.12
Panel unit 2_ default rate in SMEs segment (DRSME)				
ECT	-0.27*	0.13	-2.10	0.03
ΔDR_{t-1}	-0.48*	0.15	-3.19	0.00
$\Delta LKIR_t$	-0.03	0.41	-0.08	0.93
$\Delta LCPI_t$	-0.10*	0.05	-2.09	0.03
$\Delta LCPI_{t-1}$	0.02	0.05	0.51	0.61
$\Delta LDRNS_t$	-0.35	0.82	-0.43	0.66
C	-16.78	9.40	-1.78	0.07
Panel unit 3_ default rate in retail segment (DRR)				
ECT	-0.13*	0.05	-2.27	0.02
ΔDR_{t-1}	-0.23	0.16	-1.38	0.16
$\Delta LKIR_t$	0.34	0.48	0.72	0.47
$\Delta LCPI_t$	-0.01	0.05	-0.19	0.84
$\Delta LCPI_{t-1}$	0.02	0.05	0.48	0.63
$\Delta LDRNS_t$	0.43	0.91	0.48	0.63
C	-8.14	5.51	-1.48	0.14
Panel unit 4_ default rate in micro businesses segment (DRM)				
ECT	-0.23	0.15	-1.48	0.13
ΔDR_{t-1}	-0.41*	0.20	-2.01	0.04
$\Delta LKIR_t$	-0.40	0.98	-0.41	0.67
$\Delta LCPI_t$	-0.13	0.11	-1.14	0.25
$\Delta LCPI_{t-1}$	0.11	0.11	0.98	0.32
$\Delta LDRNS_t$	-2.31	1.85	-1.25	0.21
C	-13.98	11.40	-1.23	0.22

Source: Author's calculations; * statistically significant coefficients (p<0.05)

and micro businesses, there is a statistically significant impact of the first difference in the logistic transformation of the one-quarter lagged default rate on its own value in the current period. The direction of the impact is negative. The default rate, as a regressor in the short run, represents the transmitter of the impact of the key interest rate, as a statistically significant regressor in the long run. This would further mean that lenders, up to a maximum of 4 quarters relative to the growth of the key interest rate, tighten the loan approval criteria, and reduce default rates by slowing lending activity (contraction). In the segment of small and medium-sized enterprises, there is also a statistically significant impact of the year-on-year inflation rate, but with a negative sign, on the default rate during the same quarter, which would mean that rising inflation devalues borrowers' liabilities and positively affects their repayment capacity.

Conclusion

Research results confirm that there is statistically significant impact of macroeconomic determinants on loan default rate in banking sector of Republic of Serbia. However, in the segment of small and medium-sized enterprises, the adjustment coefficient is not statistically significant.

Along with this, in the short run, there is a statistically significant negative impact of the one-quarter lagged default rate on the default rate in the SMEs segment. Based on the research results, it can be inferred that the credit risk of the SMEs segment is the most resistant to the influence of macroeconomic factors. The obtained results are important for economic theory, economic policy makers and top management of commercial banks.

The scientific contribution of this part of the research is a confirmation of the robustness of the recognized conclusions of the default rate cyclicality [31, pp. 101-124; 9, pp. 1-37; 19, pp. 533-552; 11, pp. 1-19] based on data related to the Serbian banking market in the period covering all phases of the economic cycle. The research presented herein is one of the first for developing countries where credit risk was approximated by the default rate. Based on the review of the available literature, this research is the first also in that it analyzes the impact of client size on the cyclical nature of credit risk, based on data from one developing country, at the level of the entire banking market. When it comes to developed countries, there is a limited number of studies that deal with this aspect of credit risk, but there is no unanimous view on how the size of the client affects the degree of credit risk cyclicality. The results of the research by Diana Bonfim [6, pp. 219-235] for the Portuguese market in the period from 1996 through 2002 show that with the growth of the size of the client, the degree of credit risk cyclicality increases. On the other hand, the results of other research [9, pp. 1-37; 19, pp. 533-552] show that the greatest degree of credit risk cyclicality is present precisely in small and medium-sized enterprises. The results obtained herein are significant because they confirm the regularity that with the increase in the size of the client, the degree of credit risk cyclicality also increases, based on the data from one developing country. In addition, it was confirmed that the most resilient sector of the economy is the sector of small and medium-sized enterprises when it comes to the impact of economic crises on the credit risk level. It is interesting that the results obtained herein coincide with the findings obtained by Diana Bonfim [6, pp. 281-299] for the Portuguese banking market, because credit risk of micro businesses, in addition to that of large corporate clients, is also sensitive to changes in the phases of the economic cycle.

Further research should be directed towards answering questions as to whether the regularity that an increase in client's size results in a rising credit risk exposure exists regardless of the level of economic development of a country. In addition, it should be examined why with the increase in the size of borrowers, the exposure to systemic risk also increases, i.e., whether the degree of exposure to systemic risk can be linked to the degree of operational and financial leverage. It is known that large corporate clients have a higher level of operational and financial leverage, which may be due to their size, but also the fact that they are managed by professional management guided by the desire to maximize the rate of return for the owner.

The obtained results are important for economic policy makers because they outline the fact that the sector of small and medium-sized enterprises is a generator of financial stability of an economy and a strong shock absorber of the negative impact of economic crises on a country's economy. The obtained result fits into the previously obtained findings on other characteristics of small and medium-sized enterprises, namely that they are the drivers of economic development of developing countries [14], that they are the most flexible part of a country's economy, that they are the most important drivers of innovation in an economy [13, pp. 30-39], etc.

As for the top management of commercial banks, one of their main goals being to enhance profitability with an acceptable level of credit risk, it is clear that lending to the segment of small and medium-sized enterprises can meet these conflicting goals.

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CRISIS MANAGEMENT IN HIGH-CATEGORY HOTELS IN SERBIA DURING THE COVID-19 PANDEMIC

Krizni menadžment u visokokategorizovanim hotelima Srbije tokom COVID-19 pandemije

Abstract

The aim of this research is to determine the level of importance and performance (usage level) of hotel crisis management measures during the different phases of a crisis: Before-Crisis phase, During-Crisis phase, and After-Crisis phase, and to determine the significant gap between these two levels by surveying the managers of the high-category hotels in Serbia. The questionnaires were filled out by the managers of 162 high-category hotels in Serbia (four- and five-star hotels) during the Covid-19 pandemic in 2020. The Covid-19 pandemic caused the sharpest decline in the tourism sector around the world, thus the crisis management applied in tourism enterprises will have a crucial role for the tourism industry in surviving this pandemic. The hotel managers' responses were analyzed by using the Statistical Package for the Social Sciences (SPSS). The applied methods include the descriptive statistical analysis, paired-samples t-test, and Importance-Performance Analysis (IPA). Empirical results showed that hotels were adopting various crisis management measures during the different stages of the crisis, also, the implementation of certain measures significantly affected the business operations of hotels. In addition, hotel crisis management considers that measures implemented during the Before-Crisis phase, During-Crisis phase, and After-Crisis phase are of great importance.

Keywords: *Hotel crisis management, Before-Crisis phase, During-Crisis phase, After-Crisis phase, Covid-19, High-category hotels, Serbia.*

Sažetak

Cilj ovog istraživanja je da se utvrdi nivo značajnosti i učinka (nivoa upotrebe) mera kriznog menadžmenta u hotelima u različitim fazama krize: faza pre krize, faza tokom krize i faza nakon krize, kao i da se utvrdi značajan jaz između ova dva nivoa anketiranjem menadžera hotela visoke kategorije u Srbiji. Anketne upitnike su popunili 162 menadžera visokokategorizovanih hotela u Srbiji (hotela sa četiri i pet zvezdica) tokom pandemije COVID-19, u toku 2020. godine. Pandemija COVID-19 izazvala je najoštriji pad u turizmu, pa će krizni menadžment koji se primenjuje u turističkim preduzećima imati ključnu ulogu za turističku privredu u prevazilaženju posledica pandemije. Odgovori menadžera hotela analizirani su korišćenjem Statističkog paketa za društvene nauke (SPSS). Primenjene metode obuhvataju deskriptivnu statističku analizu, t-test i analizu značaja-performansi (IPA). Rezultati su pokazali da su hoteli u različitim fazama krize usvajali različite mere kriznog menadžmenta, a primena pojedinih mera je značajno uticala na njihovo poslovanje. Pored toga, krizni menadžment u hotelima smatra da su mere koje se primenjuju u fazi pre krize, tokom faze krize i faze posle krize od velikog značaja.

Ključne reči: *Krizni menadžment u hotelijerstvu, faza pre krize, faza tokom krize, faza posle krize, COVID-19, visokokategorizovani hoteli, Srbija.*

Introduction

Tourism is "an important economic activity, with a positive impact on economic growth, mobilizing and capitalizing on a wide range of resources" [3]. As a key component of development in many countries, notwithstanding its notable economic power and apparent resilience, tourism is highly vulnerable and susceptible to internal and external crises, including economic recession, natural disasters, epidemic diseases and pandemic outbreaks, terrorist attacks, political instability, wars, and etc. All of these crises have a negative impact on the tourism and hospitality sectors [1], [14], [48]. However, despite occasional shocks, international tourism has seen continued expansion demonstrating the sector's strength and resilience and benefiting all regions in the world. International tourism has experienced declines in 2003 following the SARS (Severe Acute Respiratory Syndrome) epidemic that spread in many parts of the world and the Iraq War and in 2009 amid the economic and financial crisis, with strong and rapid recovery in the following years [45]. The COVID-19 pandemic led to the greatest loss of international tourist arrivals around the world (Asia and the Pacific region - 83%, Middle East and Africa - 75%, America - 69%, Europe 70%) [46].

The increasing number of crises stimulates the hotel and tourism sector to consider crisis management best practices more than ever before. If an organization is incapable of coping with risks, then it is likely that it will end up in a corporate crisis [35]. Therefore, crisis management has become an important part of contemporary business; moreover, the knowledge and the readiness of a company's management to respond to a potential crisis play a crucial role in the prevention and successful crisis management during the crisis and in its aftermath. The hotel companies have to take care of the service quality [47]. In addition, the level of the hotel managers' knowledge about crisis management, their awareness of the possible sources of the crisis, development of crisis plans and crisis manuals to be used by hotel crisis teams have all become exceptionally important [5].

This paper focuses on the performance and importance of crisis management measures in high-category hotels in Serbia (four- and five-star hotels) during the different phases of the crisis: Before-Crisis, During-Crisis, and After-Crisis. The aim is to determine the level of importance and performance of each phase of crisis management and whether there is a gap between the importance and performance of the crisis management measures. Therefore, starting from the assumption that a proactive management approach is important, the following hypotheses are formulated as follows:

H_1: The measures of the Before-Crisis phase of crisis management are extensively performed in high-category hotels in Serbia.

H_2: The crisis management measures implemented during the Before-Crisis phase have the highest importance for the managers of high-category hotels in Serbia.

H_3: There is a significant difference considering the importance of the crisis management measures in high-category hotels in Serbia during the different phases of the crisis, as well as in the performance of such measures.

Literature review

The impact of crisis events on tourism has so far received considerable attention in the research area [2], [4], [11], [15], [16], [27], [28], [34], [42]. The tourism industry is vulnerable to various crises and disasters, and its growth has been impeded due to unpleasant situations [12].

Generally, a crisis in tourism involves disrupting events with a significant impact on the organizations in the sector, such as unfavourable economic shifts, natural disasters, terrorist attacks, political instability, and bio-security threats [16]. Tourism is often unable to rebound as quickly as other businesses, since much of a destination's attraction is derived from its image [7]. Therefore, the negative consequences of crises bring about tremendous challenges for the survival and recovery of the tourism industry [48].

The tourism sector, like no other economic activity with social impact, is based on interaction amongst people [45]. Considering the tourist movements, there is a massive mixing of people of all races, nations, cultures, and ages, which can lead to the emergence of epidemics and pandemics [29]. The SARS epidemic (2003), the bird flu epidemics (2003-2004) and the H1N1 pandemic (2009)

severely impacted international tourism declines [9], [25], [48]. The tourism sector is currently the sector that has been suffering the most severe consequences due to the outbreak of Coronavirus (COVID-19) (2019), including the impacts on both tourism supply and demand (hotels and airports closed, as well as national borders around the world). The COVID-19 pandemic has caused a 74% fall in international tourist arrivals during 2020, and a loss of USD 1.3 trillion in export revenues [46]. This is by far the worst result in the historical series of international tourism since 1950 and would put an abrupt end to a 10-year period of sustained growth since the 2009 financial crisis [45].

The tourism industry is one of the most susceptible and vulnerable industries to the economic crisis [16], [17]. Tourism suffered greatly during the 2009 global economic crisis. There was a 4% decline in international tourist arrivals in 2009 and revenues from international tourism fell by 6% by 2009 [44].

Tourism crises are regularly precipitated by natural disasters such as earthquakes, volcanic eruptions, tropical storms and avalanches. These disasters can be of great magnitude and are exemplified by the 2004 Indian Ocean tsunami which devastated many coastal destinations in India, Indonesia, the Maldives, Malaysia, Myanmar, Sri Lanka, and Thailand. In addition to the massive loss of life and physical damage, the tsunami inspired lingering fear and uncertainty among tourists and tourism businesses [13]. The other examples of natural disasters are Hurricane Katrina in the USA in 2005, the hurricane disaster in New Orleans in 2008, Japanese tsunami in 2011, Sandy Hurricane in the USA in 2012, etc. [14].

During the first decade of the new Millennium, terrorism has developed into a lasting crisis with a growing geographical scope [10]. National and international tourism activities are faced with different forms of terrorism threats all over the world. Terror events have severely been affecting the tourism industry worldwide increasingly since the 9/11 attacks in the USA in 2001, followed by major terrorist attacks in Bali (bombing attacks in 2002), Tunis (bombing attacks in 2002) Egypt (Sinai bombings and Taba Hilton terrorist attack in 2004; Cairo and Sharm El Sheikh terrorist attacks in 2005), Madrid (train bombings in 2004), in Jakarta (hotel bombing in 2009), Mumbai (train bombings in 2006), London (suicide-bombings attacks in the city's public transport system in 2005), Paris (terrorist attacks in 2015), etc. [14], [29]. ISIS terrorist attacks in European locations, such as Belgium, France, Germany, and Turkey had significant effects on tourism in recent years [18].

Crises are different and crisis managers need to tailor responses to the individual crises, rather than try to plan for every individual situation [33]. This puts increasing pressure on managers to consider the impact of crises on the tourism industry and develop more effective strategies to stop or mitigate the severity of their negative impacts in order to protect the tourism business [31]. Crisis management emerges as an integral part of today's tourism business [40].

The hotel industry is a very important part of the tourism industry and is not immune to crisis [48]. Owing to the numerous peculiarities of the hotel business, the sensitivity of this sector to crisis situations is higher compared to other economic sectors. Therefore, the crisis management concept must play a significant role in the operations of hotel companies [5]. The literature on crisis management in the hotel industry has achieved significant developments in recent years. Numerous authors have focused on hotel managers and examined their struggle with crisis situations [32], e.g., in hotels in the USA [41], Israel [20], Korea [23], Phuket [37], Hong Kong [26], India [19], Australia [48], Jordan [35], Egypt [14], Russia [22], the Split-Dalmatia County in Croatia [5], Greek islands [21], etc. The literature indicates that many hotel managers have limited knowledge concerning crisis management [8].

Taylor and Enz conducted a survey that included over 1,000 hotel managers in the USA following the 9/11 attacks in 2001. The hotel managers used two strategies: revenue-enhancing and cost-constraining strategies when dealing with the decline in business. Most of the hotels relied on marketing strategies focusing on regional business and redirecting sales efforts, reducing employees' working hours, instructing employees to use their vacation time and take no-pay leave, and even laying off employees. The study found that the strategy of dismissal of employees and the strategy to reduce employees' working hours were actively used by the upper-tier hotels [41].

Israeli and Reichel conducted the survey to evaluate hotel management practices in Israel in times of crisis. The study revealed that there are four categories of practices that hotel managers implement to manage a crisis: human resources, marketing, hotel maintenance, and governmental assistance. The most important and most widely used practice for managing crises is an industry-wide demand for a grace period on local (municipality) payments. The practice that ranked lowest in terms of importance is the replacement of high-tenure employees with new employees. Hotel managers feel more comfortable turning to the local government for help, rather than replacing their workforce [20]. Using the same conceptual framework and the same methodology, Israeli, Mohsin, and Kumar presented the results of a questionnaire that was completed by 145 luxury hotel executives in India. The findings suggest that crisis management in the Indian luxury hotel sector focuses on managerial actions revolving around the logic of cost-cutting and efficiency instead of marketing, maintenance, human resources, and governmental assistance [19].

Ghazi, Kattara, and Barakatt conducted a survey among hotel managers in the five regions of Egypt. When evaluating the importance of implemented practices, managers focused on government support and the change of marketing-mix, while when evaluating the usage of the mentioned practices, managers focused on price- and cost-cutting. Hotel managers focused mainly on reactive crisis management (once a crisis event occurs) rather than proactive crisis management (how can crises be prevented from occurring). At a country level, the short-term response by the government should be to exploit the media, particularly the international media, to emphasize the safety and the security of tourists [14].

Sawalha, Jraisat, and Al-Qudah studied five-star Jordanian hotels and found that crisis management was considered response and recovery activity, as opposed to proactive crises management. Results revealed that Jordanian hotels lack effective and comprehensive tools/frameworks for managing crises. The strategies adopted in Jordanian hotels for managing crises are limited, reducing their ability to respond and recover effectively [35].

Authors Bilić, Pivčević, and Čevra presented the results of a survey conducted on a sample of 59 hotels in the Split-Dalmatia County (Croatia) with the aim of providing insights into their approach to handling crisis situations. The hotel managers believe that they play a key role in ensuring the security protocols/procedures for crisis situations, nevertheless, all activities are poorly developed. The results have revealed that the practice of employee training on handling crisis situations is not well developed, as well as the protocols and procedures for crisis situations [5].

Ivanov and Stavrinoudis investigated the impacts of the 2015 refugee crisis on the hotel industry on four islands in Greece (Lesbos, Kos, Chios, and Samos) and hoteliers' responses to it. Findings revealed that the hotel managers preferred to mitigate the negative consequences of the crisis mostly by increased marketing efforts to attract more guests and cutting costs and prices, rather than by working with fewer employees, delaying payments to suppliers, or requiring more cash payments [21].

Lo, Chung, and Law in their study of the hotels in Hong Kong, suggest that in order to handle a crisis, other than cutting costs and exploring new markets, maintaining employees' morale through effective communication is also essential. Furthermore, support from the government in reviving the economy is crucial in helping hotels in Hong Kong to get back to their normal business [26]. Blake and Sinclair in their study of the USA suggested that government policies such as sector-specific target subsidies and tax reductions were the most efficient ways to handle the downturn in tourism in the USA after the 9/11 incident [6].

Research methodology

For the purposes of this research, a questionnaire was created, with the aim of exploring and identifying the hotel crisis management measures that are most commonly used to achieve the best possible hotel business results during different stages of the crisis. In high-category hotels, high quality of service is expected, but there is a lack of research about how much they use crises management. As Ghazi, Kattara, and Barakat point out, future research on this topic may focus on the 4- and 5-star hotels in different locations, i.e., countries [14]. The target population of this

research is the managers of four- and five-star hotels in Serbia. The questionnaire includes two five-point Likert-type attitude scales. The first one is used for measuring importance from 1 to 5 (where 1 represents the least important and 5 the most important), while the second Likert scale measures performance (usage level) on the scale from 1 to 5 (where 1 represents rarely used and 5 extensively used). The research was conducted during July and August 2020, when the tourism industry in Serbia experienced hard times due to the greatest health crisis caused by the COVID-19 pandemic (July – a 50.5% decline in tourist arrivals, August – a 34.3% decline in tourist arrivals) [38], [39]. Regarding the sample, there are 171 high-category hotels in Serbia in total, of which 160 are four-star hotels and 11 are five-star hotels [30]. The questionnaires were sent to all managers of these hotels. The questionnaires were filled out by 162 managers of high-category hotels (94.7% of the total number of the high-category hotels in Serbia), of which 151 were the managers of four-star hotels (94.4%) and 11 the managers of five-star hotels (100%). All five-star hotels in Serbia took part in the survey. The questionnaire is composed of three sections, the so-called phases of crisis: Before-Crisis phase, During-Crisis phase and After-Crisis phase, where each section contains its own group of statements, i.e., hotel crisis management measures. The statements contained in the questionnaire were designed by considering previous similar studies [14], [18].

The first group of claims – Before-Crisis phase (hereinafter, BCP) includes:

- Crisis Management Team (BCP1) – The hotel has a team for potential crisis identification and crisis management;
- Crisis Management Protocol (BCP2) – The hotel has plans and procedures for potential crisis situations;
- Crisis Communication Channels (BCP3) – The hotel has a free phone line for crisis situations for guests and employees;
- Hotel Budget for Crises (BCP4) – The hotel has a special budget for crisis situations;
- Crisis Training (BCP5) – The hotel regularly provides training to employees on handling crises (at least annually).

- The second group of claims – During-Crisis phase (hereinafter, DCP) includes:
- Cooperation with Stakeholders (DCP1) – The hotel manager cooperates with government officials, tourism agencies, and other key partners concerning further activities;
- Reputation Repair (DCP2) – The hotel manager strives to improve the hotel's reputation by referring to the earlier business successes of the hotel;
- Human Resources Reduction (DCP3) – The hotel manager fires the employees to reduce business costs;
- Cost Reduction (DCP4) – The hotel manager reduces operating hours for certain hotel facilities or closes a part of the hotel;
- Price Reduction (DCP5) – The hotel manager offers discounts on room prices and additional hotel services;
- Change of marketing plan and promotion strategies (DCP6) – The hotel manager changes the marketing plan and increases the promotion of new products focusing on destination attributes;
- Government Support (DCP7) – The hotel manager negotiates with the government to reduce certain fees/charges for water, electricity, sewage, etc.

The third group of claims – After-Crisis phase (hereinafter, ACP):

- Crisis Evaluation (ACP1) – The hotel has a team for assessing the effectiveness of the response to the crisis;
- Crisis Lessons (ACP2) – The hotel manager and employees learn from previous crisis to improve crisis management in the future;
- Government Budget Formation After Crisis (ACP3) – The hotel manager expects help from the government, i.e., the establishment of a state fund to help hotels after the crisis.

The collected data were analyzed by using the Statistical Package for the Social Sciences (SPSS 23). To investigate the significant gap between the importance and performance levels, the paired samples t-test was used. The descriptive statistical analysis was used in order to present the mean and standard deviation for the importance and performance levels. Based on the mean rates of each measure of crisis management the IPA was done. Accordingly, the IPA matrix consists of a

pair of coordinate axis where the 'importance' (y-axis) and the 'performance' (x-axis) and four quadrants, where rated elements are placed according to the mean values of importance and performance in relation to the whole model. According to the quadrants different strategies are suggested [36]:

- The items of the first quadrant are categorized as "Concentrate Here", meaning that managers should give attention to items placed in this quadrant. It consists of items that are of great importance, but offer a low level of performance.
- The items in the second quadrant are categorized as "Keep up the Good Work", meaning that managers should maintain the business as usual. The items are of great importance and have a high level of performance.
- The items in the third quadrant are categorized as "Low Priority". The items have low importance and provide a low performance.
- The elements of the fourth quadrant are categorized as "Possible Overkill", meaning that managers should consider reducing resources. It consists of items that have low significance, but high performance.

Results and discussion

The total number of analyzed responses is 162. According to the mean rates of the collected responses for performance, the managers of Serbian four- and five-star hotels rated the BCP measures the lowest. BCP1 (M=1.4) and BCP2 (M=1.6) are the least used measures of crises management in Serbian high-ranked hotels, i.e., hotels rarely use the team for potential crisis identification and crisis management and rarely have developed plans and procedures for potential crisis situations. Before a crisis occurs, the most used measure of crisis management is BCP5, which refers to crisis training, i.e., the hotel regularly provides training to employees on handling crisis situations (at least annually). The mean rate of 4.5 for DCP indicates that hotels are reacting to the crisis when it occurs. The most used measures of crisis management during the crisis are DCP4 (M=4.8), DCP6 (M=4.7), and DCP7 (M=4.7), meaning that very often during the crisis the hotel manager reduces operating hours for certain hotel facilities or closes part of the hotel, changes marketing plan and increases the promotion of new products with a focus on destination attributes, and negotiates with the government to reduce certain fees/charges for water, electricity, sewage, etc. The After-crisis measures are extensively used (M=4.7), especially ACP2 (M=4.8) and ACP3 (M=4.9), meaning that the hotel manager and employees learn from previous crises to improve crisis management in the future, but they also expect help from the government, i.e., the establishment of a state fund to help the hotels after the crisis (Table 1).

All measures of BCP, DCP, and ACP are rated as highly important considering that their mean scores are all above 4.3. BCP is the phase of crisis management rated as the most important (M=4.6). In this phase, the managers of Serbian four- and five-star hotels agreed that before a crisis happens the most important thing is to have plans and procedures for potential crisis situations (BCP2, M=4.8). Overall, measures of DCP and ACP are rated nearly with the same mean score of 4.5. The most important action of crisis management during the crisis is that the hotel manager has to strive to improve the hotel's reputation by drawing on the earlier business successes of the hotel (DCP2, M=4.7), while after the crisis the most important item implies that the hotel has a team for assessing the effectiveness of the response to the crisis (ACP1, M=4.7) (Table 1).

Based on the results of the paired t-test there are significant differences between the performance and the importance of BCP measures at a very high level of significance, considering that the p-value is less than 0.01 (p=.000). The highest gap between the performance and the importance of BCP measures is -3.2 (BCP2), meaning that managers believe that it is important for the hotel to have plans and procedures for potential crisis situations, however, in practice plans and procedures for crisis situations before they occur are rarely used. Between the performance and the importance of DCP measures, there are no significant differences, except for the DCP2 and DCP4, both at a high level of significance ($p \leq 0.01$). The performance and the importance levels show the highest gap for the DCP2 measure (-0.3), i.e., the hotel

manager strives to improve the hotel's reputation by drawing on the earlier business successes of the hotel – this is rarely applied by the hotel managers in practice in ordinary circumstances, but they do believe that it is important to implement this approach during the times of crisis. There is a gap for all After-crisis measures at a high level of significance ($p \leq 0.01$), where the highest one is for the ACP2 (0.5). This means that hotel managers and employees learn from previous crises so as to improve crisis management in the future, but the managers consider this less important (Table 1). Considering that out of 15 measures of BCP, DCP and ACP even 10 show the gap between the performance and importance levels, the H3: *There is a significant difference considering the importance of the crisis management measures in high-category hotels in Serbia during the different phases of the crisis, as well as in the performance of such measures.*

In addition to the mean score rates, standard deviations, and results of the paired t-test, the results of the IPA are presented in Table 1, while the IPA matrix is graphically presented in Figure 1. As previously mentioned, the IPA matrix has four quadrants, and based on the mean score of the performance and importance [24], the measures of crisis management are placed in the mentioned quadrants. The authors Silva and Fernandes suggest that "a study with the values of intermediate scales is indispensable to do an analysis based on the overall median values; it is also suggested by some authors that the median value of the data reported to cross the axes should still be considered, based on the trend of responses, median values as a measure of central tendency is theoretically preferable to mean because a true interval scale may not exist" [36, p.312]. Therefore, the median values are used for determining IPA quadrants. According to the IPA matrix, DCP7 is the measure that the managers should apply in order to keep up the good work, i.e., the hotel manager's negotiations with the government to reduce certain fees/charges for water, electricity, sewage, etc., thus having both high performance and importance for the managers of four- and five-star hotels. Concerning the measures before the crisis, especially BCP1, BCP2, BCP3, as well as DCP2 and ACP1, managers should focus more on implementing them in practice as they are marked as highly important. This confirms H2 which reads as

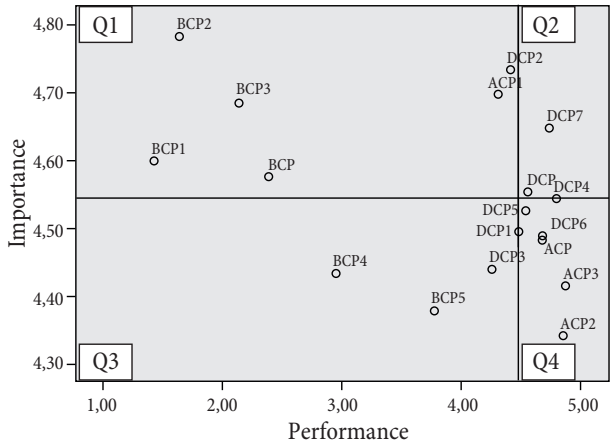
Table 1: Performance and importance of crisis management measures - results of statistical analysis

	Performance		Importance		GAP		IPA
	Mean	Std. Deviation	Mean	Std. Deviation	Mean (P-I)	Sig.	
BCP	2.3815	.60013	4.5753	.39359	-2.19383	.000	Concentrate here
BCP1	1.4259	.69430	4.5988	.78384	-3.17284	.000	Concentrate here
BCP2	1.6358	.91064	4.7840	.63753	-3.14815	.000	Concentrate here
BCP3	2.1358	1.03663	4.6852	.58418	-2.54938	.000	Concentrate here
BCP4	2.9444	1.16496	4.4321	.93168	-1.48765	.000	Low Priority
BCP5	3.7654	.96229	4.3765	.87771	-.61111	.000	Low Priority
DCP	4.5450	.38055	4.5529	.31490	-.00794	.831	Keep Up the Good Work
DCP1	4.4691	.73233	4.4938	.82090	-.02469	.785	Low Priority/Possible Overkill
DCP2	4.4012	.86663	4.7346	.61849	-.33333	.000	Concentrate here
DCP3	4.2469	1.05772	4.4383	.90507	-.19136	.079	Low Priority
DCP4	4.7840	.49493	4.5432	.80448	.24074	.001	Keep Up the Good Work/ Possible Overkill
DCP5	4.5247	.78969	4.5247	.77380	.00000	1.000	Possible Overkill
DCP6	4.6667	.63049	4.4877	.85783	.17901	.042	Possible Overkill
DCP7	4.7222	.51379	4.6481	.77598	.07407	.332	Keep Up the Good Work
ACP	4.6646	.46179	4.4835	.48873	.18107	.000	Possible Overkill
ACP1	4.2963	1.09141	4.6975	.69684	-.40123	.000	Concentrate Here
ACP2	4.8395	.41574	4.3395	.98538	.50000	.000	Possible Overkill
ACP3	4.8580	.42975	4.4136	.82391	.44444	.000	Possible Overkill

Source: Authors

follows: *The crisis management measures implemented during the Before-Crisis phase have the highest importance for the managers of high-category hotels in Serbia*; however, the *H1: The measures of the Before-Crisis phase of crisis management are extensively performed in high-category hotels in Serbia*, is rejected considering the low performance of BCP. Other measures are considered less important (Figure 1).

Figure 1: IPA matrix



Q1: Concentrate here; Q2: Keep Up the Good Work; Q3: Low Priority; Q4: Possible Overkill.

Conclusion

Crisis management should be a part of any organization. In terms of management, a proactive approach is considered more effective than a reactive way of solving problems; however, in case of a crisis, an organization should make plans and teams in order to be ready to adequately respond to a possible crisis. In today's ever-changing environment different crisis situations are very likely to occur. One of the biggest crises that hit the tourism industry, COVID-19, led to great losses and pointed out the significance of good crisis management for different organizations in order to stay in the tourism market.

This study indicates that managers of high-category hotels in Serbia most frequently use the measures implemented in the After-Crisis phase, and then those that belong to the During-Crisis phase, while the measures applied in the Before-Crisis phase are the least used ones. This means that a proactive way of planning and preparing for a possible crisis is not often present in the four- and five-star hotels in Serbia. The measures of crisis management in the Before-Crisis phase, During-Crisis phase, and After-Crisis phase are highly important according to the managers of high-category hotels in Serbia. It is interesting that measures of the Before-Crisis phase are rated as the most important and are at the same time the least performed measures in high-ranked hotels in Serbia. Besides the gap between the performance and the importance in the Before-Crisis phase, there is also the gap between the performance and the importance in the After-Crisis phase. This is in line with the results of the study done by Ghazi, Kattara and Barakatt indicating that hotels are mainly focused on reactive crisis management (once a crisis event occurs), rather than the proactive crisis management [14]. Therefore, proactive planning should be adopted as a part of crisis management in hotels.

Although the results of the study may not be generalized to all hotels in Serbia, as only the managers of four- and five-star hotels were surveyed, they represent very good guidelines for comparing key measures that hotel managements use in crises. The results of the paper could be of benefit to all the managers and owners of hotels in Serbia since they provide valuable information on commonly used hotel crisis management measures, but also serve as a recommendation to state authorities to develop a national strategy for crisis management in the hotel industry. Future research should be focused on comparing the use of crisis management approaches in hotels of different ranks (ratings), as well as measuring and comparing the results of the crisis management in hotels. Besides this, the results of this study can be used in future research for the purposes of comparing the crisis management approaches in high-ranked hotels in Serbia, in the aftermath of the crisis caused by the COVID-19 pandemic.

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RETRACTION: INFLUENCE OF EXTERNAL FACTORS ON FOREIGN DIRECT INVESTMENT FLOWS USING THE EXAMPLE OF THE VISEGRAD GROUP AND SERBIA

Opoziv: Uticaj eksternih faktora na tokove SDI na primeru Višegradske grupe i Srbije

FROM THE EDITORIAL BOARD

Abstract

The review paper entitled "INFLUENCE OF EXTERNAL FACTORS ON FOREIGN DIRECT INVESTMENT FLOWS USING THE EXAMPLE OF THE VISEGRAD GROUP AND SERBIA" authored by Aleksandar Kemiveš and Lidija Barjaktarović published in the Volume 69, issue 1-2 of the journal *Ekonomika preduzeća*, dated 25/05/2021, DOI: 10.5937/EKOPRE2102080K is being retracted due to plagiarism.

Sažetak

Pregledni rad pod nazivom "UTICAJ EKSTERNIH FAKTORA NA TOKOVE SDI NA PRIMERU VIŠEGRADSKE GRUPE I SRBIJE" autora Aleksandra Kemiveša i Lidije Barjaktarović objavljen u broju 69(1-2) časopisa *Ekonomika preduzeća*, od dana 25.5.2021., DOI: 10.5937/EKOPRE2102080K povlači se zbog plagijarizma.

EXPLICATION

Following the report of the anonymous whistleblower, which was forwarded to the Editorial Board by the Center for Evaluation and Science (CEON) on November 1st, 2022, in which it was stated that the text of the article in question represents an attempt to cover up plagiarism using the "synonymization" technique. Consequently, the authors took an entire paragraph from documents available online.

After conducting a comprehensive analysis of the plagiarism report and the article in question, the Editorial Board concluded there was a gross violation of journalistic-ethical norms and, in accordance with the Rulebook on dealing with illegitimate articles published in scientific journals referenced in the Serbian Citation Index, made the decision to retract the article.

The authors have been informed about the decision of the Editorial Board and accepted it. We apologize to the scientific community for the lack of sufficiently reliable plagiarism detection software and inform it that we initiated the procedure of implementing iThenticate software from the next issue onwards.

DOI: 10.5937/EKOPRE2206371K

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RETRACTION: ENTREPRENEURIAL UNIVERSITIES AND INTERMEDIARY ORGANISATIONS AS A SUCCESS FACTOR IN SMES: LITERATURE REVIEW

Opoziv: Preduzetnički univerziteti i posredničke organizacije kao faktor uspešnosti malih i srednjih preduzeća - pregled literature

FROM THE EDITORIAL BOARD

Abstract

The review paper entitled "ENTREPRENEURIAL UNIVERSITIES AND INTERMEDIARY ORGANISATIONS AS A SUCCESS FACTOR IN SMES: LITERATURE REVIEW" authored by Ernad Kahrović published in the Volume 68, issue 3-4 of the journal *Ekonomika preduzeća*, dated 20/05/2020, DOI: 10.5937/EKOPRE2004229K is being retracted due to plagiarism.

Sažetak

Pregledni rad pod nazivom "PREDUZETNIČKI UNIVERZITETI I POSREDNIČKE ORGANIZACIJE KAO FAKTOR USPEŠNOSTI MALIH I SREDNJIH PREDUZEĆA - PREGLED LITERATURE" autora Ernada Kahrovića objavljen u broju 68(3-4) časopisa *Ekonomika preduzeća*, od dana 20.05.2020, DOI: 10.5937/EKOPRE2004229K povlači se zbog plagijarizma.

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In accordance with the Rulebook on dealing with illegitimate articles published in scientific journals referenced in the Serbian Citation Index, the Editorial Board made the decision to retract the article.

The author has been informed about the decision of the Editorial Board and accepted it. We apologize to the scientific community for the lack of sufficiently reliable plagiarism detection software and inform it that we initiated the procedure of implementing iThenticate software from the next issue onwards.

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