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Univerzitetski trg 2, 18000 Niš, Republic of Serbia
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Editor-in-Chief: **Dejan Spasić**, e-mail: *fueaoed@junis.ni.ac.rs*
University of Niš, Faculty of Economics
Republic of Serbia, 18000 Niš, Trg Kralja Aleksandra 11
Phone: +381 18 528 629, Fax: +381 18 523 268

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Miloš Babić, University of Niš, e-mail: *milosb@ni.ac.rs*

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Review Paper

FINANCIAL AND ECONOMIC MODELS FOR EDUCATIONAL SERVICES IN THE CONTEXT OF UKRAINE AND THE EU STANDARD HARMONIZATION

UDC 364.2:37]:33(477:4-672EU)

Liudmyla Shulgina[1], Małgorzata Okręglicka[2]

[1]National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", Ukraine
[2]Czestochowa University of Technology, Poland

Abstract. *The article is focused on the need for a systematic approach to the harmonization of Ukrainian and the EU standards and the proposal to develop standards for training specialists in the relevant field in compliance with the standards on the level of qualifications and working conditions of teachers. The conflict between human rights for spiritual and physical development and the lack of opportunities for respecting these rights has been identified. It is proposed to resolve the specified conflict by introducing financial support for entrants. The starting positions of the formation of financial and economic models for providing/obtaining educational services have been outlined. The bases for the implementation of these models are: the strategy of innovative education development; the infrastructure for providing information support for decision-making; as well as the system of criteria for determining the appropriateness of the model selection. Regarding the feasibility of introducing financial and economic models for providing/obtaining educational services in Ukraine, what has been discussed, among others are: public, business, credit, self- and combined financing. The criteria for the selection expediency and the application of each model are justified.*

Key words: *financial and economic model, educational services, state financing, business financing, credit financing, self-financing, combined financing.*

JEL Classification: A23, I22, P46

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Corresponding author: Małgorzata Okręglicka
Czestochowa University of Technology, Generała Jana Henryka Dąbrowskiego 69, 42-201 Częstochowa, Poland
E-mail: m.okreglicka@wp.pl

1. INTRODUCTION

Each stage in the socio-economic development of civilization has certain characteristics and the understanding of life quality standards. “The increasing importance given to education in a country leads to the contribution to both an improvement in the economy and socio-cultural structure and an increase in the quality of services provided to citizens by the government” (Goksu & Goksu, 2015; Havierniková et al., 2017). In the authors’ opinion, modern conditions of the functioning of Ukrainian society are primarily defined as “a market”. This determines all the aspects of their life, including traditionally non-commercial areas, among which there are health care, church, education etc.

The forms of market relations in these areas, which predominate in Ukraine nowadays, are perceived ambiguously and require consideration/evaluation from at least two points of view. The proponents of the first point of view argue that in order to meet any need (including treatment, education, etc.), it is necessary to form the appropriate material basis. Thus, the commercialization of these areas is quite logical, since there is an objective need to cover the costs of providing the material basis for the provision of the service. At the same time, the opponents of this point of view emphasize that this refers primarily to the area of an individual’s spiritual needs satisfaction (in learning and self-development) and the physical needs of people (as living organisms). This area cannot be put in line with other branches of the national economy. In addition, the right to meet these needs is enshrined in the Constitution of Ukraine: “Article 23. Everyone has the right for free development of their personality, if this does not violate the rights and freedoms of other people, and has responsibilities to the society, which provides free and comprehensive development of their personality” (the Constitution of Ukraine, 1996). The word “provides” has been written in bold to point out the main idea of Article 23: the State undertakes measures to ensure the recognition of these rights or it entrusts these functions to some of its representatives.

Consequently, we have a conflict between human rights for spiritual and physical development and the lack of real opportunities to respect these rights. Simultaneously, we should not ignore the fact that the specified conflict is actual for the significant part of Ukrainian citizens who are gifted and interested in self-development and education. Unfortunately, no research has been carried out yet to establish socio-economic, scientific, technical and other losses of the State because of the ‘population’s underdevelopment' due to their insolvency. It is understood that these losses are substantial for the economically active population, not only young but also middle-aged and senior citizens. First of all, these are the losses at the personal level, which subsequently accumulate into the losses of the family, enterprise, region, country. The specified economic losses should be added to the whole of social losses at all levels, including the ‘purchase’ of educational services by consumers who do not have the necessary level of knowledge for higher education but become students and get a diploma in the future only due to their solvency.

All of the above issues are considered a set of significant negative factors of a permanently low quality of life for a large part of the population for a long time. It is the problem extremely difficult to solve, the symptoms of which are observed at all levels of the socio-economic, cultural-political etc. subsystems of the Ukrainian national system. In other words, the statement by K. Nemeshayev (Znamienitaia fraza, 2002) “Cadres decide everything!” (which was later picked up by other well-known figures and cynically used in their own, not always decent, agendas) continues to be underestimated. Indeed, in the independent Ukraine, a systematic approach to the formation and development of a

harmonious personality has not yet been designed. Personality in which the harmonious combination of not only internal physical and mental health but also the love for a healthy social and natural habitat as well as (being not less important!) the ability and willingness to preserve, protect and improve it were presented. Such a person should be the foundation of civil society, because they are highly educated, focused on true humanitarian values and high living standards and, therefore, it is difficult and even impossible to manipulate them.

Hence our belief in the validity of the following theses: there is a close connection between the problems of low quality of life and the lack of a systematic approach to the formation of a harmonious person; both of these problems are complex and urgent to be solved; in the system of a harmonious personality development, higher education is only one of the subsystems of education at different levels; proceeding from the previous thesis, all work on improving the form and content of higher education as a subsystem (including the process of educational standards harmonization) must take into consideration the fact of interdependence between the components of the whole system.

On the basis of the systematic approach to the appropriate standards for an improvement in the quality of life through the formation of a harmonious person, in the authors' opinion, it is expedient to do the work in the following sequence: firstly, to study the important factors of the aforementioned conflict between human rights for spiritual and physical development and the lack of opportunities for their recognition; secondly, based on the findings of the study, to develop possible ways of leveling this conflict especially by working out the feasible financial and economic models for providing/ obtaining educational services in Ukraine.

2. Literature Review

While the business transformation was generally successful, the education and research suffered from the lack of financial resources, a higher age structure of academics and often complex legislation (Ivanicka& Tomlain, 2015). This is why, "many countries have already initiated the collaboration of educational units in order to compare their own higher education systems with others and to find common solutions" (Çekerol & Öztürk, 2012). It is emphasized that "major transformations in European higher education systems were believed to be necessary for Europe to become a knowledge economy" (Aydarova, 2014).

The Bologna Process and its consequences "herald perhaps the most far-reaching reforms in European higher education in this century" (Mitchell & Mitchell, 2014). It has become a symbol of globalization in the educational area (Yergebekov & Temirbekova, 2012). Still, "there are doubts on the overall effects of standardization of countries with a completely different social-educational system which could not fully fit into the standard principles, because of different values and patterns" (Alimehmeti & Hysa, 2012). In addition, there is "limited knowledge of the extent to which the BP actually is leading to a converging process of national higher education policies" (Kehm & Teichler, 2007; Heinze & Knill, 2008).

The analysis of the scientific publications devoted to the issue has shown that some preconditions were important to solve the aforementioned problem in Ukraine.

Among other factors, the first should be the participation of Ukraine in the Bologna Process the country joined in 2005 and became one of the 48 European member countries. The purpose of the Bologna process is to create and develop a European scientific and educational space (Rashkevich, 2014). On this path, a lot has already been

done to bring the national system of higher education in line with the European one. This includes the development of lifelong learning strategies, definition of educational degree and its duration, educational program improvement and bringing them closer to the requirements of the labor market, implementation of the ECTS system, dissemination of innovative teaching methods, etc. (Prickodchenko, 2012; Severova, 2015; Todorescu et al., 2012).

Secondly, in Ukraine the processes of harmonization of domestic standards with European ones in all areas of life, including education, have been intensified since the signing of Association Agreement between Ukraine and the European Union. The significant progress in the chosen path is evidenced by the growth in academic mobility volumes in 2014-2019. However, there is a negative point in this trend (which is undoubtedly progressive for Ukraine) – the directions of student and teacher migration clearly indicate that Ukraine has ended up on the periphery of educational space, and not only of the European one (Association Agreement, 2015).

The authors consider the aforementioned preconditions, to a large extent, to be forming a favorable environment in order to achieve the objective set. However, in addition to them, there are sufficient deterrent factors. These are the following: imbalance of the educational system in terms of preparing specialists the national economy really needs and at the same time excessive attention to 'fancy' specialties; discrepancy between the level of remuneration of education staff and the social significance of their work; the absence of state regulatory mechanisms (including financial ones) that would motivate talented students and teachers to develop as effectively as possible and, subsequently, to stay in Ukraine.

It should be added that, in the current process of harmonization of the EU and Ukrainian educational standards, the attention is focused exclusively on the content of curricula in the preparation of individual specialties. However, other elements of the education system are not taken into account, i.e. on the one hand, different levels of education (from preschool to third-degree education), while on the other hand, different circumstances of the process of providing/obtaining educational services (in particular, the procedures accompanying this process; methods of training and selection criteria for teachers; interconnections with other contractors of the labor market; the possibilities of using different methods of financing in education, etc.).

As the aforementioned (and far from complete!) list of actual preconditions for the appearance of the conflict under investigation evidenced, a systematical approach should be used to solve it. The above will be illustrated with a short example. Therefore, the authors believe that the development of standards for training specialists in a particular specialty (forming the content of educational services) should be coordinated with the development of standards for the level of qualifications and working conditions of teachers (providing quality provision of educational services according to the previous standard to students).

3. METHODOLOGY OF THE RESEARCH

The purpose of this article is to outline the essence and conditions for the implementation of financial and economic models for providing/obtaining educational services in the context of the Ukrainian and EU standard harmonization process, provided by the authors.

The information database of the study consisted of the following sources: the Constitution of Ukraine, the Law of Ukraine on Education, the Law of Ukraine on Higher Education, data from official websites of the Ministries of Education of Ukraine and Azerbaijan, informational portals of Columbia, Spain, France, Iran, Germany, Cyprus, Czech Republic, scientific publications of Ukrainian and foreign scientists, results of in-depth interviews conducted by the authors with representatives of the listed countries.

In the course of the research, both general scientific and specific marketing methods were used. In order to compare current financial-economic models of granting/receiving educational services in different countries, a desk analysis of secondary information obtained from the above sources was used.

In order to find out the attitude of consumers of educational services towards existing models, as well as to test the proposed models, the primary information was collected and analyzed by the students of Ukraine and all the countries listed above.

4. Research Results

The authors have analyzed the methods of solving the outlined problem in post-Soviet countries (Law of Ukraine on Education, 2017; Law of Ukraine on Higher Education, 2019; Law of the Republic of Azerbaijan, 2009); Western Europe (Education in Poland, 2019; Learning in France, 2019; Romanovskyi, 2015); Asia (Tackmasby, 2014), North and South America (Education and Science, 2019; Higher education in Canada, 2019), generalized the world experience in the financing of providing/obtaining educational services and formulated several conclusions:

- in all the countries covered by the study, both types of educational institutions operate – public and private;
- private institutions are usually more prestigious, since they have the financial capacity to form a better material and technical base, to organize comfortable conditions for studying and teaching, to attract the best lecturers and, accordingly, provide the most up-to-date educational technologies;
- countries pay significant attention to the successful implementation of the national development strategy, while having a well-developed system of grants and scholarships to support talented youth, academics and scientists;
- in most countries (from the studied sample), the level of payment for education is comparable to the amount of possible material compensation (in the form of a grant, assistance, etc.) as well as to average wages, which guarantees a decent standard of living.

In addition, the surveys of representatives from different countries have demonstrated that there is not a perfect funding system yet for providing/obtaining educational services in any of them. However, "there is the lack of consensus on how higher education should be financed" (Long, 2019). An important problem for all the studied educational systems remains the complexity of determining the cost of education, calculation of the volume in order to meet the social needs for specialists (which also should affect the cost of education), etc. However, practically, in each of the studied foreign systems, there are separate attributes, which are useful to be tested and adapted to the education system of Ukraine.

The authors have formulated the initial points for the formation of financial and economic models for providing/obtaining educational services in Ukraine, based on the

results of the study in Ukraine on the factors both favorable and unfavorable for the development of a harmonious personality, as well as taking into account the peculiarities of the process of Ukrainian and the EU standards harmonization:

- It is necessary to create appropriate financial and economic conditions for free and comprehensive development of every citizen of Ukraine as a consumer of educational services, including in terms of the implementation of the "Lifelong Education" strategy;
- It is necessary to ensure multivariate financial and economic models (FEM) for the provision/acquisition of education to create the conditions for simultaneous implementation of different models and the possibility of their free selection for potential customers, given significant variety of needs of educational service users;
- The development and implementation of FEM should contribute to the growth in the efficiency, on the one hand, of the higher education sector in terms of strategic (long-term) and tactical (short-term) measurements but, on the other hand, at all possible levels (state, university, teacher, student).

The initial points formulated by the authors emphasize that the development of FEM today is an extremely important and urgent task, the solution of which determines the successful implementation of the national development strategy of Ukraine and hence the promising position of the State on the geopolitical map of the world. There is no need to prove the close relationship between the competitiveness of the worker, the company and the country; as well as the fact that the aforementioned indicator, in turn, depends on the conditions (including financial-economic) providing opportunities to constantly work on increasing its level. The last one (the need for constant improvement) is a challenge to the rapid pace of development of all areas of life. These require continuous education, i.e. lifelong education. Thus, in the process of developing FEM, it is necessary to take into account the fact that segments of customers of educational services are significantly diversified today (on the basis of the branch, income of applicants, age, type of training). This, of course, affects the differences in their needs and, therefore, requires different methods to satisfy them.

It is not less important to understand that the choice of FEM for providing/obtaining educational services in the country, their content and relationships can be considered as a kind of indicator of the actually chosen strategic development course of the State, the level of social orientation of its political and economic systems, state of democratization of the society, etc.

Proceeding from the above, the authors believe that, for Ukraine, it is expedient to have a harmonized combination of the following FEM for providing/obtaining educational services:

1. ***Public financing*** – identification of the most talented entrants, training them using public funds through special training programs using incentive programs for further career and career prospects (the expediency of the model is guaranteed by the needs of the State). This is due to the fact that the financing of higher education is deeply embedded into the political system of the country (Teichler, 2018).
2. ***Business financing*** – training of specialists, which requires representatives of certain industries at their expense and in close cooperation with them. This involves the coordination of training and apprenticeship programs, teaching certain subjects by practitioners, internship of teachers and traineeships by students, employment of graduates (the feasibility of the model is guaranteed by the needs of the business).

3. ***Credit financing*** – obtaining a loan for studying (from the future employer, an independent sponsor, the State, etc.) – this model is possible in Ukraine today only if the State guarantees the financial security of both the lender and the borrower. However, Palacios (2014, p. 208) argues that this form of financing creates lower risk than one might think. He points out that "students are likely to have less information about their future prospects than their lenders".
4. ***Self-financing*** – training at own expense (the expediency of the model is guaranteed by the educational institution and the State, on the basis of the database on the needs for specialists).

It is clear that the introduction of these models in the territory of the country requires the development of appropriate **ideological (conceptual), marketing and legal support,** in which (among other things) the following *components* should be included:

1) the strategy for innovative development of education;
2) the procedure of forming the infrastructure for providing information support for decision-making;
3) the criteria for determining the appropriateness of choosing one or more FEM for providing/obtaining educational services;
4) the list and sequence of amendments made to the legislative framework, the purpose of which is to ensure the efficient functioning of each model, as well as obtaining additional opportunities for financing educational services.

An important task which needs to be solved in the context of the implementation of the proposed FEM for providing/obtaining educational services is to determine the criteria for the expediency of the selection of one or more models. The authors believe that the first of these – ***Public financing*** – should have the following criteria:

1) the State need for specialists (accurate and reliable information provided by the above information-support decision-making system);
2) assessment of the applicant's success, and
3) the amount of material support necessary to provide the applicant with the appropriate quality of life.

The authors emphasize in particular that, unlike the current State funding, firstly, the objective should be to promote the training of the most talented students; secondly, it should be formed on the basis of the scientifically grounded data on the State's need for specialists; and thirdly, it should foresee the volumes that guarantee a high level of motivation of the scholarship holders.

While anticipating the opponents' disagreement with the stated approach and their main argument – significant expenditures of the State budget on the implementation of the proposed programs, the authors want to note that all countries, now classified as developed, began their rapid development precisely from an increase in target expenditures on education and science. The state which does not finance its own intellectual resources – loses them. This is confirmed by a massive outflow of 'intellectuals' from Ukraine to the countries where the financial and economic conditions correspond to the emigrants' idea about payment relevant to their contribution and prospects for growth.

Business financing – the choice of this model is based on the following criteria:

1) high achievements in a particular industry or activity (for example, top positions in contests or competitions on the chosen subject, scientific and technological development that may be of interest to business representatives, etc.);

2) positive references from employers interested in the continuation of cooperation with the candidate (for example, after successful testing, internship or practice);
3) the forecasted employer's need for hiring a qualified specialist (i.e. the expected vacancy for the future employee after their higher education graduation);
4) solvency of the creditor company (i.e. their ability to finance scholarship training and their needs for providing the necessary standard of living).

The described model may have variations, depending on whether the funds for scholarship should be returned to the lending company after the work is started or not. The option of partial financing is also possible by scholarships being obtained already during the period of studying under the conditions of a flexible schedule of work, part-time work, while fulfilling creative tasks at weekends or carrying out theoretical work in the framework of educational tasks.

Therefore, the business financing model can be very beneficial for both businesses and scholarships holders. Business, at relatively low costs, will receive the in-depth analysis of activities, access to the latest techniques, verified suggestions for improving performance indicators – all of this will be received while performing tasks in the course of subjects, research work of scientific circles, tasks within the framework of research work of departments, courses and diploma projects. At the same time, in the contract, it is expedient to provide for the possibility of adjusting the subject of these types of work to update them in accordance with the situational or prospective needs of the enterprise.

The most important advantages of the scholarship in this model are: guaranteed employment (which is an extremely important achievement nowadays, especially given increasing competition in the labor market); obtaining experience in carrying out practical tasks, even in the course of studying; obtaining the education according to the program, which is thoroughly worked out and agreed upon by representatives of educational institutions and business; an in-depth study of peculiarities of the company's operations and the future place of work; provided that the creditor's tasks are effectively performed, – acceleration in career growth on the basis of the mutually beneficial cooperation.

The next FEM – ***Credit financing*** – is quite common in many countries, however, is still not represented in Ukraine, mainly because of peculiarities of the domestic financial and credit systems. According to the authors' firm belief, the formation of transparent and reliable legal conditions for the implementation of this model is an urgent task for the country nowadays. However, it should be reminded at once: in all investigated lending systems operating in foreign countries, students receive an interest-free loan or a minimum interest rate (2-5%). Its repayment begins only after getting a job and lasts (in most cases) for 20-30 years.

The above indicates that Credit financing is especially attractive for most citizens, since the percentage of the most talented (who may qualify for Public financing) is usually insignificant as well as the share of winners of competitions (with high chances to get Business financing). The main advantages of Credit financing are the following:

1) the lack of obligations of the recipient to creditors regarding future employment in the precisely defined directions (compared to the previous two FEM), and
2) the opportunity to focus exclusively on studying. These can be important criteria for students who are still in search of and definitively not determined by the future area of activities or a specific place of work.

The fourth one from the list of FEM proposed by the authors is ***Self-financing***. The more common name in Ukraine is studying under the contract form. Self-financing is one of the two models presented in the market of education services of the State nowadays. The expediency of learning at the expense of students' own funds is supported, however, with some adjustments. First, the solvency of the applicant cannot be the only criterion for enrollment in the students' ranks. It is not a secret that while working in a competitive environment, higher education institutions are trying to improve their financial position precisely at the expense of 'contractors'. Some of them really have a quite sufficient level of preparation for higher education. However, among them, there are those who satisfy purely 'material interest' of universities. In practice, this is manifested in reducing the level of quality requirements for cross-border controls; in the replication of masters' articles, course projects, diplomas, etc., which are questionable in terms of the indicator of 'scientific depth and, in general, in leveling the concept of '**higher** education' or '**science**' as well.

In the authors' opinion, the number of seats for the first two categories described above, for Ukraine, may be changed and should be determined on the basis of the information-support decision-making system proposed by the authors. However, the principle of selection the authors consider valuable is to apply all FEM (including Self-financing) only to representatives who have got the right to study at universities.

Secondly, the conclusion of the contract for Self-financing should take place only after the applicant is familiarized with the following data:

1) the current need for specialists,
2) the forecast for a decrease (or an increase) in this demand, taking into account the already existing number of students / listeners studying in the specific course,
3) as well as the dynamics of prospective vacancies.

In other words, the data of the information-supported decision-making system should be open not only for employees of the education system but also entrants, which should facilitate the adoption of a balanced and well-founded decision on the direction of education.

Thirdly, the upper and lower boundaries of the cost of studying, with regional and sectoral differentiation should be legally established. Fourthly, following the experience of Poland, a clear list of services universities cannot claim any fees for should be clearly defined. It is clear that this also applies to all of the above FEM. In the opinion of the authors, the following should be included in this list: any services that have already been taken into account in determining the cost; using the library fund; access to the multimedia library; obtaining statements (references) from universities; consultations within the framework of paid study schedule, etc.

Combined financing is an additional opportunity to improve the material conditions of education, if there is a need and there are appropriate grounds to do so. Foreign experience indicates the multiplicity of possible sources of Combined financing.

One of such sources is the presidential scholarship in Azerbaijan, which is granted for special achievements in studying at the submission of the rector, and the amount of which is quite substantial – AZN 750 ($ 850), especially when compared to regular scholarships for students ($30-75). There is a similar scholarship in Poland, the State scholarship or grant in Canada (OSAP scholarship), in Germany, Cyprus, etc. The authors will emphasize that these scholarships are intended for students for special achievements, regardless of the initial financial conditions of their studying.

Another important source used virtually in all the analyzed countries is the university scholarship fund which is distributed by the rector together with student and postgraduate government bodies according to the criteria for achievements in education and social status (social scholarships).

Some countries (France, Iran, Czech Republic, etc.) partially compensate for the amount needed to rent an accommodation, as well as scholarship for people with special needs.

5. CONCLUSIONS

"Education and training are central objectives of Lisbon agenda for growth and jobs and they are essential for their continuation to 2020" (Lung et al., 2012). The literature emphasizes significant economic and non-economic public and private benefits for higher education. However, the general trend in the higher education system is that policymakers are trying to prove the necessity of shifting expenditures on HEIs from governments to students (Erfort et al., 2016).

The solution to the existing conflict in Ukraine between human rights for spiritual and physical development and inadequate opportunities for their recognition is possible under the condition of the formation of the multi-vectored and multileveled educational system. The processes of Ukrainian and EU standards harmonization are the factor favorable for the implementation of necessary reforms, including education. However, for this purpose, the standards for training specialists (outlining the content of educational services) should be developed in coordination with the standards for training and working conditions of teachers (which guarantee the quality and conditions for providing educational services to students). The necessary consistency between the two groups of standards will be ensured through the creation of the appropriate ideological (conceptual), marketing and legal basis, which should consist of the following components:

1) the strategy for innovative development of education;
2) the procedure of forming the infrastructure for providing information support for decision-making;
3) the criteria for determining the appropriateness of choosing one or more FEM for providing/obtaining educational services;
4) the list and sequence of amendments made to the legislative framework, the purpose of which is to ensure the effective functioning of each model, as well as obtaining additional opportunities for financing educational services.

In order to eliminate the barriers of the applicants' insolvency, it is proposed to implement a harmonized combination of several financial and economic models for providing/obtaining educational services. Public financing is offered to the most talented entrants, for whom special training and motivational programs should be developed. Business financing is the training of specialists at business costs in close cooperation with sponsors. Credit financing is quite widespread in the world model and satisfactory for Ukraine provided that the State guarantees the financial security of both the lender and the borrower. Self-financing is an advanced model of the current contract-based training. Combined Financing is a combination of the proposed models, taking into account the specific conditions for the specific recipient.

Given the differentiation of segments of educational service consumers, each of the listed models should be available for the relevant segment. In order to provide a reasonable choice of the model, the criteria for the feasibility of their application are proposed. The authors consider the promising direction of the research to develop the necessary set of standards harmonized with the EU ones for the effective implementation of the proposed financial and economic models.

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FINANSIJSKI I EKONOMSKI MODELI OBRAZOVNIH SERVISA U KONTEKSTU HARMONIZACIJE UKRAJINE I EU STANDARDA

Članak se fokusira na potrebu za sistematskim pristupom ka harmonizaciji standarda između Ukrajine i EU i na predlog da se razviju standardi za obuku eksperata u relevantnim oblastima u skladu sa standardima na nivou kvalifikacija i uslova rada nastavnika. Prepoznat je konflikt između ljudskog prava na fizički i duhovni razvoj i nedostatka uslova da se ta prava ostvare. Predloženo je da se navedeni konflikt razreši uvođenjem finansijke podrške kandidatima. Navedene su početne pozicije za formiranje finansijskih i ekonomskih modela za pružanje/korišćenje obrazovnih usluga. Osnove za implementaciju ovih modela jesu strategija inovativnog razvoja obrazovanja; infrastruktura za pružanje informacione podrške donošenju odluka; kao i sistem krriterijuma za određivanje odabira odgovarajućeg modela. Posmatrajući izvodljivost uvođenja finansijskih i ekonomskih modela za pružanje/korišćenje obrazovnih usluga u Ukrajini ramatrani su, između ostalog: državno, biznis, kreditno, samo- i kombinovano finansiranje. Razmatrani su i kriterijumi za srsishodnost odabira i primene svakog od modela.

Ključne reči: *finansijski i ekonomski model, obrazovne usluge, državno finansiranje, biznis finansiranje, kreditno finansiranje, samofinansiranje, kombinovano finansiranje.*

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Review Paper

NONPERFORMING LOANS AND FINANCIAL STABILITY – THE CASE OF SERBIA

UDC 336.77(497.11)

Velimir Lukić, Svetlana Popović, Irena Janković

University of Belgrade, Faculty of Economics, Serbia

Abstract. *This paper investigates resilience and stability of the Serbian banking sector in the light of deteriorated quality of its credit portfolio since the last world economic crisis. Nonperforming loans became a burning issue across Eastern European region. We used a set of indicators to appraise the magnitude of nonperforming loans' burden to the banking sector's soundness. Indicators verify that the Serbian banking sector was robust and solvent throughout crisis. Nonperforming loans were concentrated in nonfinancial corporations' sector, while households sector performed much better, which influenced remedy measures undertaken. We carried out a comparison with peer countries and reviewed nonperforming loans resolution strategy implemented in Serbia. Our finding is that measures taken helped noticeably in reducing stock of nonperforming loans, with a caveat that reduction might have been too fast and too large so that bounce back effect cannot be excluded. Overall, financial stability has been preserved despite serious threats and without government financial aid.*

Key words: *banking sector, nonperforming loans, crisis management, financial stability*

JEL Classification: E42, E58, G21

1. INTRODUCTION

Central banks were commonly held responsible for maintaining price stability and legal norms referencing to this objective are incorporated in literally all national central banking laws. A global consensus on interpretation of price stability evolved, so it is defined as the rise in the general level of prices of around 2 per cent per annum, which is accomplished by vast majority of countries.

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Corresponding author: Velimir Lukić
University of Belgrade, Faculty of Economics, Kamenička 6, 11000 Belgrade, Serbia
E-mail: velimir@ekof.bg.ac.rs

Commencing in the middle of previous decade, the scope of central banks' responsibilities started to widen with financial stability becoming a relevant objective gaining increasingly in importance, especially after the financial turmoil. A survey on the central bank objectives stipulated in central bank laws revealed that objectives related to monetary policy were explicitly specified in all 47 central banks included in analysis, while ranked at a second place – with a share of somewhat less than a half of a sample, stood objectives related to financial stability, and with a share of less than a quarter employment, growth and welfare objectives and support policies of government objective were listed (BIS, 2009).

Opposite to the definition of monetary stability, there is still no uniform and easy way to understand definition of financial stability. European Central Bank (ECB, 2006) defines financial stability as a condition in which the financial system is capable of withstanding shocks and the unravelling of financial imbalances, thereby mitigating the likelihood of disruptions in the financial intermediation process which are severe enough to significantly impair the allocation of savings to profitable investment opportunities. Preceding definition enables vast interpretations as it may encompass many possible economic situations.

Primary negative implication of financial instability is linked to the occurrence of systemic risk. When an event is perceived as a shock that initiates a loss of confidence in a critical portion of financial system by market participants, it possesses power to create serious adverse effects on the real economy and loss of output. For example, Friedman and Schwartz (1963) argue that banking panics lead to the advent of financial instability due to the general public's loss of confidence in the banks' ability to convert deposits into cash money. Contraction of deposits follows that triggers cut in money supply and diminishing economic activity. Ćirović (2001) emphasizes the importance of systemic risk in banking in the form of a bankruptcy of one large bank that initiates chain process which negatively impacts banking and financial system. Besides, there are non-negligible chances of spillover effects from the banking system to the real economy.

The main issue for a banking sector, and root cause of financial and banking instability in general in bank-centric financial systems, are nonperforming loans. A nonperforming loan is a loan at which contractually defined payments from debtor to creditor are not met in full or in a due time. A nonperforming loan is more than just an indicator of a debtor's inability (or unwillingness) to pay, it is a burden for both the lender and the borrower (Balgova et al, 2016). Anastasiou et al. (2019) argue that high rate of NPLs may also cause expectations about the stability of the banking system to deteriorate, creating systemic risk that may in turn lead to a run on deposits, significantly reducing the intermediation power of banks.

2. MEASURES AND INDICATORS OF NONPERFOMING LOANS' BURDEN TO BANKING SECTOR

In order to assess the magnitude of nonperforming loans' burden to the banking sector's soundness, several indicators have been devised. They are based on accounting data contained in banks' balance sheet and profit and loss account. Most frequently used indicators are:

a) nonperforming loans to total loans
b) nonperforming loans net of provisions to (regulatory) capital
c) provisions for nonperforming loans to nonperforming loans
d) provisions for total loans to nonperforming loans

According to the International Monetary Fund (IMF, 2006) a loan should be classified as nonperforming when a) payments of principal and interest are past due by three months (90 days) or more, b) interest payments equal to three months (90 days) interest or more have been capitalized (reinvested into the principal amount), refinanced, or rolled over (payment has been delayed by agreement) or c) payments are less than 90 days past due but its status is envisaged by national regulatory rules, where "unlikely to pay" criterion has been usually pursued.

Behind "unlikely to pay" criterion may stand a variety of triggers that signal potential financial difficulties of the debtor. Such as: a) lawsuit against debtor in order to collect debt, b) multiple restructurings on one credit obligation, c) significant increase in overall leverage, d) loss of major customer, e) materially significant decrease of turnover/operating cash flow, f) fraud, g) negative or qualified opinion of auditor, h) file for bankruptcy etc. (ECB, 2017).

Importantly, the amount of loan recorded as nonperforming should be the gross value of the loan as recorded on the balance sheet, not just the amount that is overdue.

Nonperforming loans to total loans is a general indicator and the best available measure of the credit portfolio quality as it shows the share of potentially uncollectible loans to total loans. This indicator is backward looking and summarizes errors of the past credit activity. It is also a lagging indicator due to the time elapsing between nonpayment of loan obligation and its classification as nonperforming. High value of indicator signals credit portfolio of bad quality, while its stable and low value is a sign of well performing portfolio. The strong pace of growth of this indicator in successive time periods may be alarming, suggesting that individual bank or banking sector is losing control over credit portfolio. It is expected to follow the pattern of nonfinancial corporations' financial standing and overall economic conditions in a country.

As with subsequent indicators, its informative power is dependent upon the appropriate recognition of nonperforming loans. Data on nonperforming loans are essential for creating a realistic and reliable picture of banking sector financial soundness, which sometimes can be compromised particularly at the level of individual banks facing financial strains. The bank may underestimate the actual deterioration in credit quality, such as in the case of evergreen loans.

For analytical purposes, this indicator ought to be calculated for each institutional sector (nonfinancial corporations, households etc.) allowing for a disaggregated view on the credit portfolio quality. In addition, loans to nonfinancial corporations should be further differentiated according to debtor's core economic sector and indicator in question compiled accordingly by comparing nonperforming loans to total loans for these core sectors. The corporate sector is a key channel through which shocks affect banking sector with change in its leverage ratio having significant impact on banks' credit portfolio quality with a one year time lag (IMF, 2003).

Second indicator - nonperforming loans net of provisions to capital – indicates whether bank capital is enough to withstand loan losses stemming from credit exposures that are yet to be written off. Technically, if in any single bank loan losses outweigh capital, the bank is insolvent.

Two considerations need to be clarified in relation to this indicator. First, it would be an exaggeration to claim that a whole amount of nonperforming loans would need to be backed up by bank capital, meaning that recovery rate on these loans would be zero. Banks employ a number of techniques to mitigate credit risk, starting with an adequate

collateral and guarantees, due to which as a rule actual loan losses are lower than maximum projected loss. Major drawback is that the appraisal of recovery rates is immensely uncertain. Secondly, provisioning policy determines when and how much banks should provision against nonperforming loans. Loan loss provisions reduce the gross amount of the accompanying loan in the balance sheet so as to calculate its net value, and are often referred to as specific loan loss provisions. Net value of a loan is the best guess a bank can make about loan amount it expects to collect from debtor and reflects the loss in value of impaired assets.

Provisioning is set in a progressive way so as to attribute higher percentage of provisions to loans with a higher likelihood of default and expected loss. Formation of specific provisions reduces profit in the respective period and their outstanding amount accumulates through time if the riskiness of the loan rises. The higher specific provisions against an individual loan or collectively assessed group of loans, the less impact will nonperforming loans have on bank capital. Loss provisions serve as a buffer against diminishing level of bank capital.

Low levels of ratio of nonperforming loans net of provisions to capital point to a resilient and solvent banking sector. On the other hand, high levels of ratio indicate inadequate provisioning policy that allowed banks to delay addressing problem with nonperforming loans which grew over time.

Provisions for nonperforming loans to nonperforming loans provide a measure of the portion of bad loans for which provisions have already been set aside. It is directly related to the numerator of the previous indicator, since it uses the same accounting data. Often it is referred to as coverage ratio. When coverage ratio reaches one hundred percent, the net value of nonperforming loan is zero, and it can be completely written off without any bad repercussions to bank capital or financial result in the current reporting period.

Finally, the last indicator depicts the total capacity of provisions to cover nonperforming loans losses. In most instances, actual value of provisions for total loans to nonperforming loans ratio is very close to provisions for nonperforming loans to nonperforming loans ratio, because provisions for collectible loans are low and usually in the range 0,25-1%.

Živković et al (2018) provide review of additional indicators of bank assets quality.

3. Overview of Nonperforming Loans in Serbia

In 2014 Serbia ranked 7th worldwide according to the nonperforming loans to total loans ratio. This fact signaled a need for active measures to reduce the stock of nonperforming loans.

Data on nonperforming loans in banking sector is available as of September 2008, when an official definition concerning them was issued by National bank of Serbia (NBS) and first data gathered. NBS adopted the definition from the IMF. Figure 1 displays stock of nonperforming loans to total loans and regulatory capital. Right from the beginning of collecting data for nonperforming loans, a gap between the two ratios has started widening. While ratio of nonperforming loans to total loans doubled in five years, ratio of nonperforming loans to regulatory capital more than tripled, creating stress for both banks and the NBS. Despite adverse developments in the two ratios, capital adequacy of the banking sector, measured by regulatory capital to risk-weighted assets, stayed strong during the period featuring most acute problems with nonperforming loans - 2009-2014.

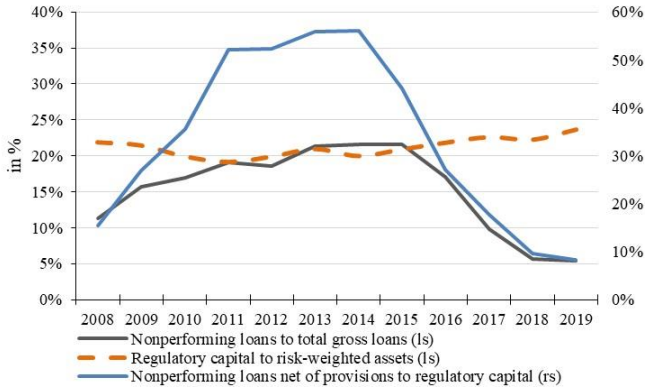

Fig. 1 Nonperforming loans vs. regulatory capital and gross loans
Source: Authors' presentation based on data from NBS

Apart from NBS data, Association of Serbian Banks has been gathering data on bank clients` indebtedness and arrears from the establishment of Credit Bureau in 2004. Its data base is accurate, reliable and daily updated and may serve as a cross check vis-a-vis NBS data, while it is especially important for analyzing bad loans data prior to 2008. Credit Bureau publishes monthly information on the share of defaults (arrears) in credit debt - classified by the type of the borrower: a) legal entities (companies), b) entrepreneurs and c) individuals (natural persons). Credit reports became available for individuals in October 2004, and for companies and entrepreneurs from May 2006.

Credit Bureau follows clear-cut rules for defining default on outstanding debt. For legal entities and entrepreneurs any debt repayment that has not been cleared in 15 days after due date is to be classified as default, while for individuals that period is extended to 60 days.

Figure 2 displays data available from Credit Bureau. The share of defaults in credit debt for individuals (households) has never entered double digit zone. Developments in total share of defaults in credit debt were predominantly influenced by nonfinancial corporation sector, which can be explained by the leading role of this sector in total bank loan volume and high level of defaults observed in it.

When comparing Figure 1 with Figure 2, one can observe that ratio of nonperforming loans to total loans is consistently above share of defaults in credit debt, in the range 5-9 percentage point, for the period up to 2016. This discrepancy comes from methodological differences in computing respective ratios, where first ratio includes in the numerator total unpaid amount of principal on the loan of which at least one installment is overdue, while second ratio takes into account only amount actually in default, i.e. only after repayment end date total principal would be included in the numerator. For short-term loans this difference does not make a big effect, while opposite is true when longer term loans are in question where in the first half of the repayment period only small fraction of principal is repaid.

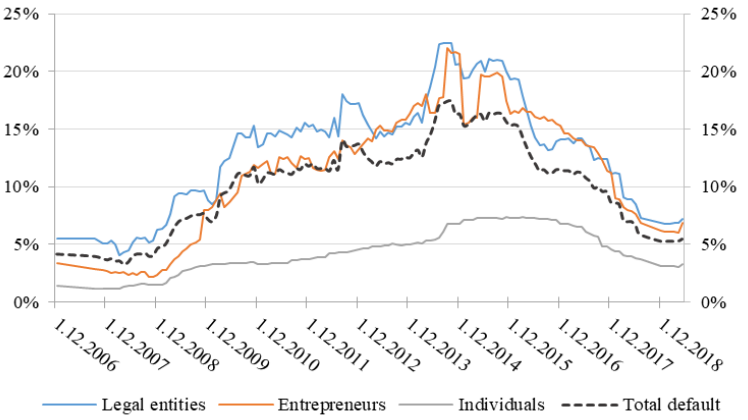

Fig. 2 Share of defaults in credit debt
Source: Authors' presentation based on data from the Association of Serbian Banks

Analysis of nonperforming loans of nonfinancial corporations provides insight about what economic sectors financial and economic crisis has been affecting the most. In 2010 more than 75% of total nonperforming loans were related to companies, either ongoing entities or entities that filed for bankruptcy. Figure 3 depicts developments of portions of nonperforming loans in each economic sectors in total companies' nonperforming loans.

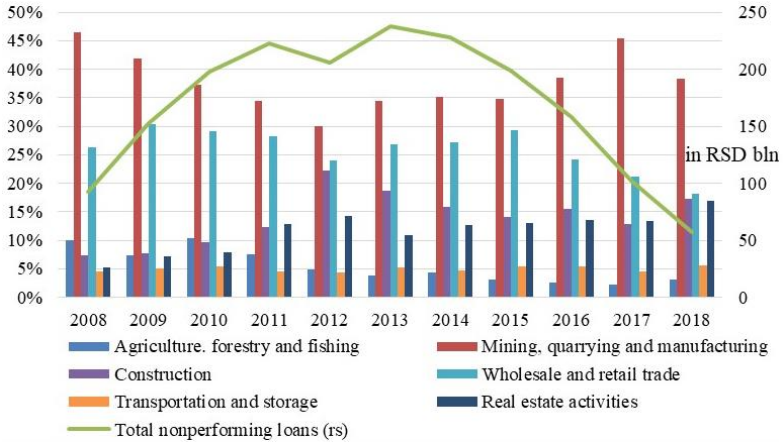

Fig. 3 Composition of nonperforming loans of nonfinancial corporations by economic sector (% of absolute amounts)
Source: Authors' presentation based on data from NBS

The bulk of the problem with nonperforming loans in absolute terms is linked to mining, quarrying and manufacturing, and wholesale and retail trade sectors. However, the same situation occurs in normal times since these sectors dominate with highest economic activity and loan volume. Thereby, an adequate measure of economic standing

in each sector, and conditions for doing business in it in the course of time, is ratio of nonperforming loans to total loans in each sector.

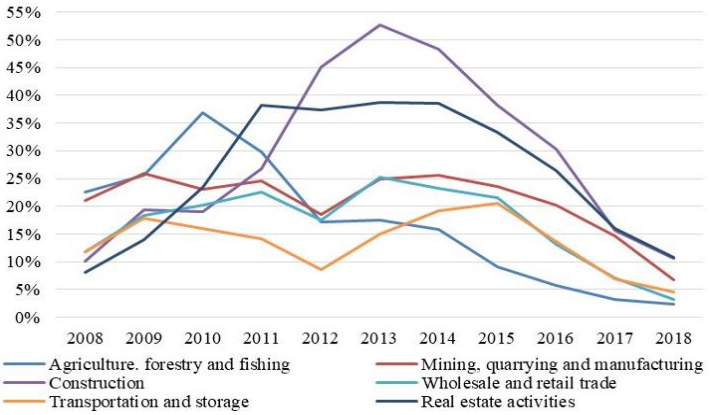

Fig. 4 Nonperforming loans rates across economic sectors
Source: Authors' presentation based on data from NBS

Figure 4 illustrates that already at the outset of crisis the ratio of nonperforming loans was over 20% in agriculture, forestry and fishing, and mining, quarrying and manufacturing. In the first two years of crisis, real estate activities (comprising also professional, scientific, innovation and technical activities, administrative and support services, other services, art and entertainment) and agriculture, forestry and fishing lead in negative reaction to unfavorable economic environment. Companies operating in these sectors were facing immense financial difficulties, so default rates rose sharply. Interestingly, default rates peaked in 2010 for agriculture, forestry and fishing, and have exhibited declining trend ever since. On the opposite side, from 2010 default rates in construction sector escalated, so in general this sector performed the worst during crisis period together with real estate activity sector. The culmination of problem occurred in 2013 when more than a half of outstanding loans in construction were nonperforming. As for other sectors, their nonperforming loan rates varied in a narrower range; while mining, quarrying and manufacturing as the holder of the largest part of outstanding loans recorded peak rather early - in 2009.

Households sector is also important for banks and it can be observed from Figure 2 that it performed much better than nonfinancial corporations in terms of default rates. Nonperforming loans ratio of natural persons' loans stayed below average due to the low ratio for housing loans that have consistently accounted for close to one half of total loans. However, nonperforming loans have been steadily increasing from 2008 with amount of 19,8 billion dinars, up until 2015 when they reached maximum of 88,2 billion dinars. Figure 5 shows developments in level and structure of natural persons' nonperforming loans.

Nonperforming cash and housing loans have commonly represented the predominant bulk of total nonperforming loans in Serbia. The participation of loans for other (business) activities and other loans, two rather heterogeneous categories of loans, rose immensely during crisis years in the composition of nonperforming loans since both posted a double digit share. Thereby, these loans inter alia determined developments of overall nonperforming loans in household sector.

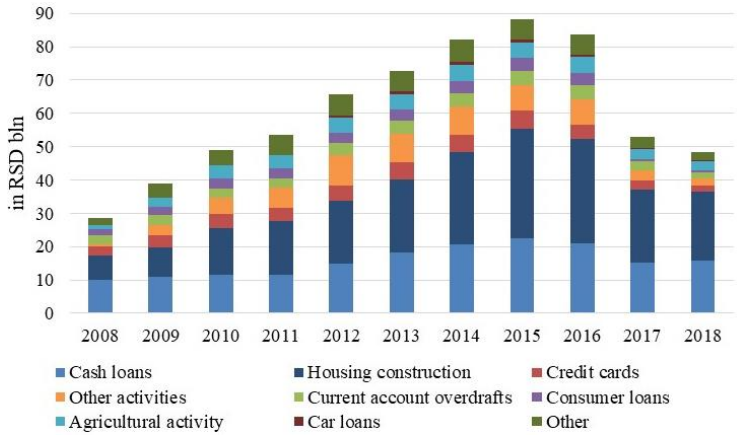

Fig. 5 Composition and level of natural persons' nonperforming loans
Source: Authors' presentation based on data from NBS

More detailed analysis of common types of natural persons' loans reveals some interesting findings. First, ratio of nonperforming loans for cash loans fluctuated unpredictably in a narrow band (9,3%-11,3%) in 2008-2015 time frame, implying that crisis on average did not influence performance of this type of loan. Second, one may observe pattern in movement of ratio of nonperforming loans for housing loans that is in line with appreciation of Swiss franc against euro. There were two episodes of appreciation – a) 2010-2011 and b.) one-off shock in 2015. Ratio of nonperforming loans increased in both episodes, because of strong adverse impact on Swiss franc indexed housing loans, while lagged effect of appreciation with smaller magnitude can be also observed. Due to favorable interest rates on housing loans indexed in Swiss franc before the crisis, 22 709 loans out of outstanding 85 676 housing loans in 2011 were denominated in it, i.e. more than a quarter of all housing loans. At the same time, and even more striking, they accounted for 37% of outstanding debt on housing loans. Third, ratio of nonperforming loans for consumer loans all the way to 2012 was exhibiting downward trend, when it sharply surged upward. In 2014, ratio equaled 28,5% which set consumer loans at the top of list of all type of loans according to the ratio concerned. Since 2012, consumer loans have had the highest ratio among common types of natural persons' loans. Fourth, although credit cards loans and current account overdrafts seemingly look like close substitutes, since both act as pre-approved credits, their ratios of nonperforming loans had different dynamics in observed period. Ratio for current account overdrafts was already high in 2008 – 14,8%, also the highest in all loan categories, but it did not change a lot in the following period during which it moved both up and down. Contrary, ratio for credit cards loans was 6,1% in the same year and followed continually increasing path, made height in 2014 with 14,3%, but has never surpassed respective ratio for current account overdrafts. Fifth and finally, car loans entered loan statistics as a distinct type of loan in 2012 and ever since have kept status as a type of loan with the least ratio of nonperforming loans. For many reasons, this fact seems illogical, since one does not commonly expect users of car loans to behave in such a prudent manner.

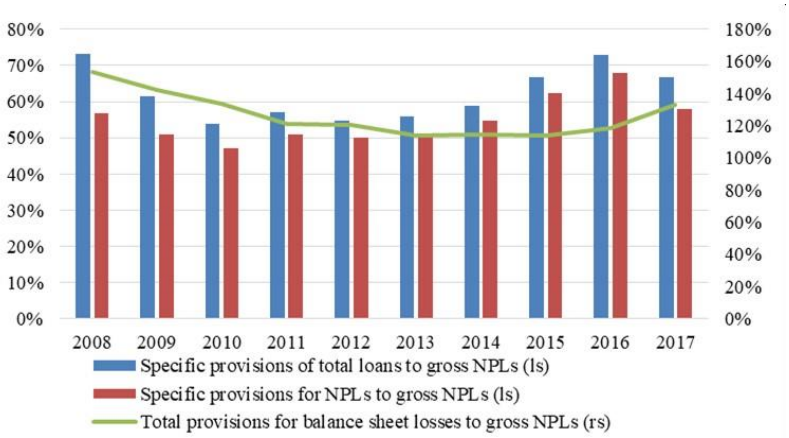

Fig. 6 Provisions for nonperforming loans
Source: Authors' presentation based on data from NBS

Figure 6 displays three indicators related to nonperforming loans coverage. Up to 2014, the coverage through regular accounting provisions was below pre-crisis level, still acceptable. It rose only when banks became exposed to NBS measures that stimulated write-offs and more realistic provisioning. However, regulatory provisions prescribed by NBS were markedly higher than accounting ones, which created an image of adequately capitalized banking sector even under the worst case scenarios. Regulatory provisions hence played an important role in preserving financial stability.

4. Case of Serbia Against Other Nonperforming Loans Cases in Emerging Europe Since the Last World Economic Crisis

In order to assess the depth and uniqueness of the problem with nonperforming loans in Serbia, some cross country comparison covering period since the last world economic crisis with similar European countries is deemed instrumental. A group of countries from Central and Eastern Europe represents a natural benchmark.

The global economic slowdown ended period of high growth rates in these countries. Klein (2013) finds that the level of nonperforming loans in countries considered can be attributed to both macroeconomic conditions and banks` specific factors, with the latter having a relatively low explanatory power. The level of nonperfoming loans tends to increase when GDP falls, unemployment rises, exchange rate depreciates, and inflation is high. A vast recent literature confirms finding that macroeconomic factors are primary determinant of the quality of banks` assets (Beck et al., 2013, Moinescu, 2012, Jakubik & Reininger, 2013, Vatansever & Hepsen, 2013, Škarica, 2014, Makri et al. 2014, Tanasković & Jandrić, 2015, Kjosevski & Petrovski, 2016).

Figure 7 shows that at the outbreak of the crisis Serbia has already had the highest ratio of nonperforming loans – 11,3%, whilst ranked second was the Republic of North Macedonia with ratio of 6,7%. Very quickly other countries started to catch up with Serbia. Lithuanian case is striking since NPL ratio rose from 6,1% to 24% in just a year

after the crisis. In 2009, Serbia, Lithuania and Latvia had NPL ratio over 10%, to be accompanied by six other countries in 2010.

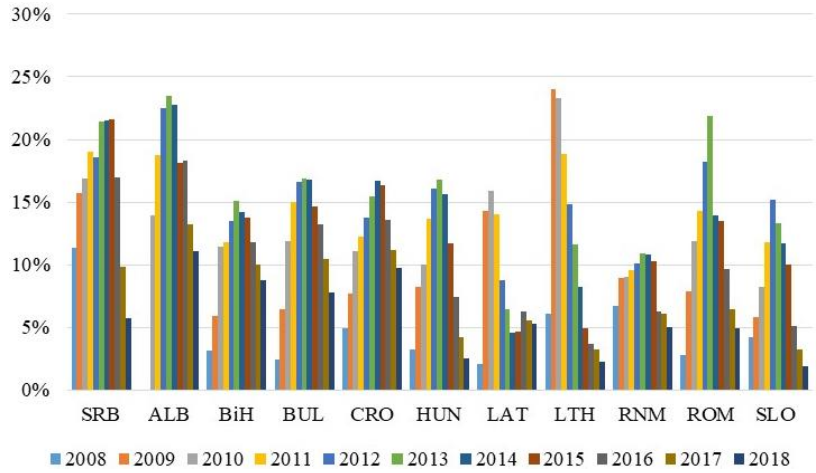

Fig. 7 Bank nonperforming loans to total loans across countries
Source: Authors' presentation based on data from IMF FSIs

Without exception all countries encountered, to bigger or smaller extent, the issue of nonperforming loans. In terms of the level of nonperforming loans, the case of Serbia can be compared to Lithuania, Romania and Albania cases. Other European countries faced similar, and even more severe problems. Cyprus and Greece have been struggling with bad banks' assets for years. In 2015 reported NPLs ratio in Cyprus was 47,7%, while as of today it did not succeed in resolving nonperforming loans issue that escalated in 2011. Greece has been also undergoing difficult times with its banking sector that posted NPLs ratio of 45,6% in 2017. On the other hand, there were countries that have circumvented nonperforming loans issue – Czech Republic, Slovakia, Poland and Estonia. Interestingly, both Czech Republic and Poland have been having low share of foreign currency denominated loans that has not exceeded 30%.

Several joint features may be discerned concerning countries from Figure 7. First and foremost, foreign component in the banking sector, either directly over the bank ownership, or indirectly through properties of regular operations, was overwhelming. Foreign ownership in banking sector was expected to provide better banking, more professional conduct and state of the art technology and practice. Also, a sizeable foreign funding was expected to inflow in countries through foreign subsidiaries that would set ground for strong credit growth. However, a detrimental omission has been made since these funding came in foreign currency denominations and whole credit system has been adapted so as to local loans kept the denomination of funding currency. Otherwise, banks could have been exposed to heavy exchange rate risk.

When a country intends to join the euro area in a foreseeable future, this property should not make a large effect in terms of nonperforming loans emergence, since exchange rate is basically fixed up-front for a considerable time span according to mandatory procedure and phases that lead to euro adoption. For example, one cannot argue that exchange rate risk is

accountable for Latvia or Lithuania case of nonperforming loans. Bulgaria and Bosnia and Herzegovina have a currency board, while Slovenia joined euro area prior the crisis, meaning for all of them exchange rate risk was out of consideration as a potential cause of nonperforming loans.

However, for a group of countries encompassing Serbia, Hungary, Romania and Albania, currency depreciation impacted on acceleration of nonperforming loans stock due to the high share of foreign currency denominated loans. Hungary opted for a set of unconventional measures, some of which might have been in a collision with principles of a free market economy, such as the conversion of foreign currency indexed loans into local currency loans with low interest rates. Matolcsy (2015) serves as a good reference for the explanation of measures taken.

In sum, we distinguish several additional properties for all banking systems: a) an extremely rapid expansion of balance sheets of banks prior to the crisis fueled by low interest rate environment in euro area, b) the inadequacy of banks` preparedness and capability to deal with nonperforming loans, c) the economic downturn negatively impacting real sector companies and d) a drop in real estate collateral values (both commercial and residential).

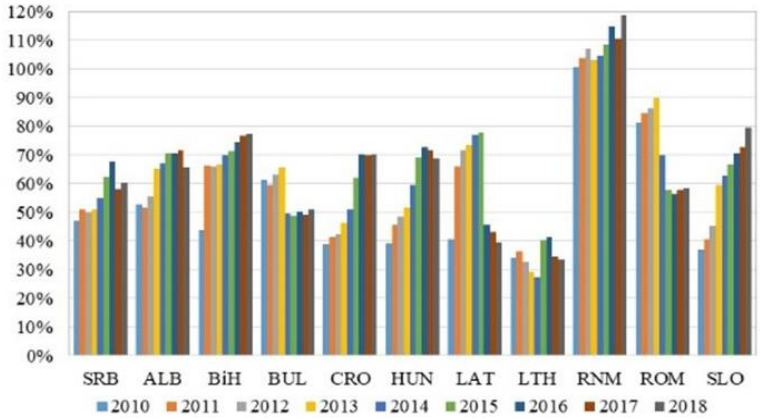

Fig. 8 Bank provisions to nonperforming loans across countries
Source: Authors' presentation based on data from IMF GFSR

Figure 8 helps infer how well prepared were national banking sectors for bad loans write-offs, and whether banks in accounting sense paid enough attention to addressing nonperforming loans issue internally. It is meaningful to match data on provisions to nonperforming loans with data on NPL ratio from Figure 7. Countries that demonstrate relatively low coverage ratio but also have low NPL ratio are less vulnerable in terms of financial stability. However, if a country posted relatively high NPL ratio with low coverage ratio, it would imply its heightened vulnerability.

This was effectively the case of Serbia which, with the exception of 2016, persistently had NPL ratio above the average of countries considered, and coverage ratio below average. In 2015, Serbia NPLs market share in 18 countries of Central, Eastern and South Eastern Europe (CESEE), calculated as Serbia gross NPLs divided by total CESEE gross NPLs, was 9,3%, while its market share in total loans outstanding was only 3,3% (EBRD, 2016).

A rise in coverage ratio observed for some countries was usually accomplished by a drop in nonperforming loans stock, i.e. denominator effect, opposite to build-up of additional specific loan loss provisions which is considered more prudent.

In general, before the majority of banks in troubled countries there stood three choices for dealing with NPLs: a) workout, b) sale and c) write-offs. Workout comprises measures aimed at restructuring credit obligation or legal collection efforts. There is no predetermined optimal solution and banks need to have good NPLs strategy in place so as to choose the right option. Intuitively, banks would prefer to keep loan on balance sheets as long as there exists some chance to collect unpaid principal. Workout is highly uncertain and costly. Some statistics show however that, albeit in normal circumstances, 60% of overdue loans are repaid within 90 days. With surpassing 90-day criterion the probability and the amount of recovery decline significantly (IFC, 2011). For example, three quarters of nonperforming loans in Serbia in April 2015 were overdue for more than a year (MoF, 2015).

Sale is commonly performed through outright sale of a loan to a third party. Since all collection activities with troubled loans are transferred to a third party, bank must accept sale at a discount. Finally, with anticipated inefficient loan collection, poor recovery amount or absence of interested buyers, bank should choose loan write-off. In many cases, central banks instruct and/or motivate banks to carry out write-offs. In dealing with huge stock of nonperforming loans, no central bank can keep aside and each country in CESEE with bad loans problems sought for assistance from reputed international institutions. In the next section, we will describe major measures implemented in Serbia.

5. Strategy and Measures for Resolving Nonperforming Loans Issue in Serbia

NBS finally made decisive coordinated move with other relevant institutions in order to counter NPL issue in 2015. Some minor measures have already been undertaken in late 2012 when NBS loosened regulatory impediments to the sale of NPLs, by allowing banks to assign due corporate loans to either another bank or another legal entity (private equity fund, special purpose vehicle etc.). In addition, new rules governing classification of bank assets were issued regarding the restructuring of receivables from entities participating in the voluntary financial restructuring schemes. Banks were given the opportunity to reset calculated number of days in arrears on receivables that were restructured, effectively to zero, according to the scheme mentioned above. The results of these measures were poor.

The turnaround point was August 2015 when the Government of the Republic of Serbia adopted a comprehensive NPL Resolution Strategy (NPLRS) involving relevant Ministries and NBS, and defined Action plan for its implementation. NPLRS was developed around four pillars: a) enhancing banks' capacity to deal with NPLs, b) enabling conditions for development of secondary market for NPLs, c) improving and incentivizing out-of-court debt restructuring and d) enhancing in-court debt resolution and mortgage framework.

NBS on its part has enhanced the regulatory framework for the treatment of restructured receivables that prevents unsustainable refinancing practices. It required banks to set up an independent unit whose task would be to deal with nonperforming loans. A large weight has been put onto proper implementation of accounting standards, with particular emphasis to IAS 39 that defines methods of recognition of impairment of receivables in banks` balance sheets, and promotion of the best practice related to write-off policies that banks implemented and cautious recognition of interest on NPLs. NBS revealed expectation to banks about

enhanced public disclosure of banks regarding data on assets quality, coupled with better reporting to NBS related to collaterals, accrued interest and largest exposures. As a result, banks became obliged to prepare and submit new forms of reports, whereas NBS established a database of valuations of real estate that was used as collateral for loans and of loans that are collateralized with respective real estates. NBS was thus enabled to monitor indicators such as loan to value (LTV) and debt service to income (DSTI) due to data from the established database. Overall, a lot of emphasis has been put to collateral management, since the crisis revealed that appraised collateral value was far above its sale price when banks used this method of debt collection. Thereby, NBS prescribed in provisions the frequency of collateral valuation on every three years.

Despite earlier NBS measures aimed at emergence of secondary market for NPLs it remained underdeveloped. Neither were banks willing to sell these loans, nor there existed demand for them reflected in interested investors. Main impediments on banks' side were related to taxation matters, inadequate loan loss provisioning and collateral valuation. Provisions for tax recognition of write-offs of corporate receivables as expenditures were excessively strict – providing hard evidence on collection actions. In addition, write-offs of receivables were treated as debt release (exposing debtors to additional tax cost equal to 2,5%), and even over that write-offs in cases of natural persons had treatment of private income (exposing banks to effective rate of personal income tax equal to 16%). Altogether, it turned out banks were exposed to additional tax costs that amplified original bad debt burden.

With amendments to existing laws and related by-laws, tax incentives have been adjusted with the needs of NPL market. Obstacle related to the inability of NPL buyer to take over an ongoing litigation proceedings, instead of commencing new proceedings, was successfully overcome by changes in the Civil Procedure Law. Hurdle linked to banking data secrecy that prevented transfer of data on debtors with debt in arrears to third parties was solved by additional interpretation of the Banking Law issued by NBS.

Table 1 Sale of nonperforming loans portfolio in Serbia (publicly available data)

Year	Seller	Type	Buyer	Buyer country	Face value (mil €)
2015	Erste Bank	Corporate	APS Holding	Czech Republic	21
2015	Banca Intesa	SME	Confidential	N/A	35
2017	HETA Asset Resolution	Commercial Real Estate	Undisclosed	N/A	289
2017	Pireus Bank	Corporate/SME	Confidential	N/A	43
2018	Nova Ljubljanska banka (NLB)	REO (Real Estate Owned)	Undisclosed	N/A	115
2018	Undisclosed	Undisclosed	Undisclosed	Undisclosed	74

Source: EBRD NPL Monitor

Measures implemented finally helped NPL market development. In Table 1 is given a list of transactions, based on publicly available data, that occurred since the adoption of NPLRS. In comparison to other NPL markets in CESEE, Serbian market seems incomparably more opaque. It is rather a rule than an exemption that the identity of buyer is kept confidential or undisclosed. EBRD data shows that 5 out of 18 registered NPL servicers in CESEE region are in fact active in Serbia. In addition, Deposit Insurance

Agency (DIA) has carried out its first auction for the sale of the NPL portfolio with notional value of 242 mil € that was completed in February 2019. Total NPL portfolio under management of DIA amounts close to 1 billion € (IMF, 2018), that makes it the biggest NPLs holder in Serbia.

The third and fourth pillar of NPLRS are essentially related to the strengthening of protection of creditor rights. Current legal system performed poorly in terms of assisting creditors to collect due debt. However, professional investors specialized in restructuring of bad assets, buyers of NPL portfolios, are critically interested in reliance and speed of legal proceedings that will enable them to pursue their strategy of recovering bad debts.

A consensual financial restructuring is a conduit for the implementation of out-of-court debt restructuring. In practice, a general assessment was that restructuring plans agreed previously underperformed the expectations, since rarely these plans ended with viable operations of troubled debtors – a success rate of below 30%. Alike banks, state creditors were quite inexperienced with formulating restructuring plans, which in some cases brought prospective plans to a halt.

Special type of a problem with in-court debt resolution stemmed from corporate groups` NPLs that accounted for a significant part of total NPLs (ex. Farmakom, Beohemija), since the Insolvency Act recognized debtor as an individual company and not as a part of corporate group comprised of connected companies. It meant that separate legal proceedings needed to be filed for every company and sometimes it involved separate local courts, which proved to be highly inefficient. Provisions related to fostering secured creditors` rights, swift disposal of assets where assets are not important for reorganization and protection of creditors that provide new financing in reorganization have been adopted. The capacities of bankruptcy administrators and Commercial Courts were strengthened, mechanism of tracking and supervising ongoing bankruptcy cases launched with their transparency increased. Finally, a lot of work has been invested in the field of the enforcement of mortgages, where particular problems arose with second-instance decision process for land registry case files where a significant backlog of cases has been formed.

Legal framework surrounding nonperforming loans was thus improved and streamlined in order to counter potential losses for creditors by, *inter alia*, following changes: a) Amendments to the Corporate Insolvency Law, b) Law on Real Estate Appraisers, c) Law on Enforcement and Security, d) Law on Consensual Financial Restructuring, e) Amendments to the Mortgage Act and f) Amendments to the Banking Act.

NPLRS with its comprehensive approach delivered measurable effects. In a three-year period starting from the adoption of NPLRS, stock of NPLs has been reduced from 427 to 141 billion RSD. An impressive fall in NPLs was mainly attributed to write-offs and sale of NPLs (to the parties outside of banking sector), 177 and 84 billion RSD respectively. Besides selling on balance sheet assets, banks have equally sold their off-balance sheet items (loans previously written off). In the observed period, the value of NPL market transactions was estimated at 194 billion RSD. Pursuant to positive developments abovementioned, NPL ratio dropped from 21,6% to 6,4% in the respective time span.

6. CONCLUSION

Nonperforming loans are a natural ingredient of banking business. However, excessive level of nonperforming loans threatens financial stability. Last time when Serbia was

confronted with widespread NPL problems, it closed four largest banks. Current NPL crisis was the first crisis of that kind in the post-transition era in Serbia, interestingly four banks were also closed during it. A combination of fairly relaxed lending criteria, economic misfortune and numerous faults in legal and accounting framework brought about NPL burden to the surface.

Despite the mandate of preserving financial stability given to the NBS, analysis above shows that instruments at its disposal were not enough to solve NPL issue on its own. In addition, NBS reacted to emerging crisis with a notable time lag. Judicial system, in all its aspects, proved to be more of a bottleneck than accelerator in tackling with NPL crisis.

Key lessons learned from the case of Serbia in coping with NPL issue can be summarized as follows: a) regulators need to prepare the setting for and encourage the clean-up of banks` balance sheets in a timely manner, b) banks need to proactively approach the potential building up of NPLs and professionalize NPL management, c) adequate tax, insolvency and enforcement frameworks must be in place together with efficient out-of-court restructuring practices and d) ultimate disposal of toxic assets is dependent upon the existence of secondary market in NPLs. To some extent, these lessons were reaffirmed in other CESEE countries.

As a positive, Serbian resolution of NPLs did not draw on utilizing public finances and government budget directly. However, as DIA manages the largest stock of NPLs and its funds were used for paying off insured deposits of closed banks, public funds have been engaged indirectly, which should be taken into consideration.

Indicators considered in analysis verify that Serbian banking sector as a whole, even with high level of NPL ratio, was robust and solvent throughout crisis, since provisions for loan losses and capital adequacy were significantly above critical zone. No systematically important bank was in a need for capital injection, though some banks were winded up.

Two external macroeconomic factors played an important role in relieving debtors of debt burden and reducing NPLs. First, loose monetary policy of cheap money and negative interest rates of ECB, and second, appreciation of RSD versus euro during implementation of NPLRS.

There exist some doubts whether a drop in NPL ratio is virtual or viable. In 2017, NBS issued a decision according to which banks were obliged to write-off all fully provisioned impaired receivables. Soon afterwards, stock of NPLs shrank considerably. Next time, NBS will not be able to surprise banks and force them to do write-offs. Secondly, Serbian economy is still fragile with below average economic growth rates compared to peer countries. Nevertheless, NBS in cooperation with other relevant institutions assembled a solid multilayer mechanism for dealing with banks` bad assets that has just passed a challenging test of resilience.

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PROBLEMATIČNI KREDITI I FINANSIJSKA STABILNOST – PRIMER SRBIJE

U radu se analizira otpornost i stabilnost bankarskog sektora Srbije suočenog sa pogoršanim kvalitetom ukupnog kreditnog portfolija od izbijanja svetske ekonomske krize. Na bazi seta odabranih indikatora procenjena je jačina uticaja problematičnih kredita na stabilnost bankarskog sektora. Indikatori su potvrdili da je srpski bankarski sektor očuvao solventnost tokom trajanja krize. Zaključak rada je da su preduzete mere značajno pomogle obaranju nivoa problematičnih kredita, uz ukazivanje na predostrožnost u krajnjoj oceni jer je smanjenje možda bilo prebrzo i preveliko pa se ne može isključiti efekat njihovog povratka u budućnosti. Finansijska stabilnost u Srbiji je očuvana i pored ozbiljnih pretnji i bez posezanja za državnom finansijskom pomoći.

Ključne reči: *bankarski sektor, problematični krediti, upravljanje krizom, finansijska stabilnost*

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Original Scientific Paper

THE INVESTIGATION OF THE INFLUENCE OF PSYCHOLOGICAL CONTRACT TYPES ON ORGANIZATIONAL CITIZENSHIP BEHAVIOUR

UDC 349.2:331.106]:005.32

Ivana Simić, Biljana Đorđević, Sandra Milanović*

University of Niš, Faculty of Economics, Serbia

Abstract. *Organizational citizenship behaviour represents the behaviour of the employees that goes beyond their duties. This type of behaviour from the perspective of employer is very desirable since it produces many positive consequences regarding individual and the overall organizational performances. However, readiness of the employees to exert this type of behaviour is influenced by many factors. One of the most important is fulfilment of employees' psychological contract. Since that there are two basic forms of contracts, relational and transactional, the aim of this paper is to investigate the relationship between these types of psychological contract and organizational citizenship behaviour. For the purpose of testing proposed hypothesis, t-test, Pearson correlation and multiple linear regression analysis were applied. The results showed that there is a positive relation and positive impact of relational psychological contract on the organizational citizenship behaviour, which was not the case when it was about the transactional contract.*

Key words: *relational psychological contract, transactional psychological contract, organizational citizenship behaviour, employees.*

JEL Classification: J28, J29

INTRODUCTION

The history of studying the psychological contract begins in 1960s (Argyris, 1960; Levinson et al., 1962; Schein, 1965), but the interest for this concept has grown significantly in the last few decades. The reason for that is that psychological contract

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Corresponding author: Sandra Milanović
* PhD Student, Junior Researcher
University of Niš, Faculty of Economics, Trg Kralja Aleksandra Ujedinitelja 11, 18000 Niš, Serbia
E-mail: sandramilanovic89@yahoo.com

appears to be very useful tool to resolve many important human resource related issues (Chahar, 2019). It appears that psychological contract is very useful concept for explanation of the issues of motivation (Pines, 2002; Parzefall & Hakanen, 2010), satisfaction of employees (Knights & Kennedy, 2005; Zhao et al., 2007; Suazo, 2009), turnover intentions (Hess & Jepsen, 2009), absenteeism (Griffeth et al., 2000), commitment, etc. (Robinson & Morrison, 1995; Anderson & Schalk, 1998; Cassar & Briner, 2011). Kishokumar (2018) also states that psychological contract is essential to understand the nature of employee-employer relationship and to maintain positive relationship between them.

In addition to the fact that psychological contract is a useful concept for the explanation of previously mentioned employees' work related attitudes and behaviour, it is also a very useful concept to explain why some employees engage in the activities that go beyond their job description. In other words, this concept is very useful for the explanation of *the organizational citizenship behaviour of employees.* In this regard, in many studies positive relationship was found between the fulfilment of employees' psychological contract and organizational citizenship behaviour (Marks, 2001; Karagonlar et al., 2016; Guest, 2016). On the other hand, it was found that violation of the psychological contact has negative impact on the readiness of employees to exert organizational citizenship behaviour (Cassar & Briner, 2009).

Although that there are plenty of studies of relationship between psychological contract (PC) and organizational citizenship behaviour (OCB) in the literature so far, it appears that in the most of them PC was seen as one-dimensional construct. However, in order to get better insight into the relationship between PC and OCB of employees, it is very useful to investigate the influence of *different types* of PC on OCB of employees. Namely, it is a very well-known fact that the basic types of PC are relational and transactional (MacNeil, 1980; Rousseau, 1990; Robinson et al., 1994). Therefore, it would be very useful to investigate the relation between relational PC and OCB of employees as well as the relationship between transactional PC and OCB of employees.

In order to find out the answers on what kind of relationship is between mentioned types of PC and OCB of employees', an empirical study was conducted on the sample of academic professors at state universities in Serbia. This country is interesting for the research in this area since due to socialism it has had a long tradition of paternalistic relation of organisations toward employees. Therefore, it is interesting firstly to find out whether employees dominantly form relational or transactional PC and, secondly, to investigate what is the relationship between different types of PC and OCB of employees.

The paper is structured as follows. In the first part of the paper the literature review on the concepts of organizational citizenship behaviour and psychological contract is given. In the second part, the methodology of the research, the research results and their discussion are presented. The final part of the paper refers to the practical implication of the paper and concluding remarks.

1. Literature Review and Hypothesis Development

1.1. Organizational citizenship behaviour

The concept of OCB has been established in the literature in the seventies of the twentieth century, but demonstrating of this type of behaviour in working place is much older. In some simplified form, this type of behaviour could be identified with the appearance of the first organizations.

In the literature, the form of OCB was identified for the first time by Daniel Katz in 1964, although he did not use that term. Such form of behaviour was denoted by Katz (1964) as „an extra-role behaviour". Katz (1964) explained it as a form of behaviour of organizational members which is not defined by their formal roles and tasks within the organization. More precisely, the mentioned author saw this type of behaviour as behaviour that implies willingness and readiness of organizational members to make additional efforts and to do more in relation to what is formally expected of them.

The creators of the very term Organizational Citizenship Behaviour are Denis W. Organ and his colleagues. It appeared in their paper "Organizational Citizenship Behaviour: Its nature and antecedents" published in 1983 (Smith et al., 1983). Since the concept of OCB has aroused interest of many authors, many definitions of this term appeared in the literature lately. First of all, Organ, as a creator of this term, defined OCB as individual behaviour that is discretionary, not directly or explicitly recognized by the formal reward system, and that in aggregate promotes effective functioning of the organization (Organ, 1988, p. 4). OCB is also defined as any positive organizationally relevant behaviour of organizational members including their in-role behaviour, organizationally pertinent extra-role behaviour, and political behaviour (Cummings et al. 1994, p. 766). It was also seen as a set of desirable organizational behaviour that exhibits multidimensional relationships with positive organizational consequences (Waltz & Niehoff, 2000).

In order to determine OCB more precisely, Denis Organ (1988) pointed five key dimensions of it. They are: altruism, conscientiousness, sportsmanship, courtesy and civic virtue (Organ, 1988). Their basic characteristics are explained in the following text.

Altruism reflects the willingness of organization's members to help their colleagues, or their readiness to spend their own time and energy on others. It is considered that this dimension of OCB has great potential to contribute to enhancing the performances of the employee to whom the altruistic behaviour is channelled.

Conscientiousness, according to Organ, reflects the willingness of members of the organization to use their own time and other available resources efficiently and rationally, as well as to provide an extra contribution to the organization by their complementary efforts.

Sportsmanship refers to the readiness of organizational members to spend their time and energy for constructive purposes within the organization, and not to complain about some trivial problems or uncomfortable working conditions they currently may face with, to sacrifice personal interests for the organizational ones, etc. The same opinion regarding this dimension of OCB is also shared by Podsakoff and his colleagues (2000), and many other authors.

Courtesy behaviour of members of the organization involves the efforts to share the available information with their colleagues, to remind them of some of their obligations, and so on. Such form of behaviour enables co-workers to use their resources and energy more efficiently, and to reduce the level of stress, anger, frustration and conflict. In some specific way, this type of behaviour maintains social order and raises the level of harmony within the organization (Organ, 1988; Wang et al, 2013).

Civic virtue refers to willingness or unwillingness of an organizational member to participate actively in the political life of the organization. This type of behaviour is based on the assumption that most of employees usually have the right to take part in some organizational meetings in which their participation is not required, to analyse some organizational issues on personal time, to express their own opinion and so on (Wang et al., 2013).

The mentioned list of OCB dimensions has been corrected by some theorists, whether they have narrowed or expanded it. Thus, for example, P. M. Podsakoff and his colleagues (2000) proposed seven dimensions of the OCB. They are: helping behaviour, sportsmanship, organizational loyalty, organizational compliance, individual initiative, civic virtue, self development (Podsakoff et al., 2000).

The degree to which employees will express the OCB form of behaviour is determined by a number of factors. Some studies have shown that among the most influential are: job satisfaction, organizational commitment, perceptions of organizational justice, leader support, trust in management, psychological contract etc. (Swaen & Maignan, 2003; Chahar, 2019; Kishokumar, 2018). Considering that the aim of this paper is to explain the influence of the PC (more precisely, some of its types) on OCB, the essence of this concept is presented in the following text.

1.2. Psychological contract

The concept of PC originated in 1960 (Argyris, 1960), but significant contribution to its development was given by many authors lately. However, probably the most significant contribution to the development of the theory of PC in recent period was given by Denise Rousseau. She was the first one who defined PC from an individual's perspective, stating that it represents "an individual's belief regarding the terms and conditions of a reciprocal exchange agreement between that focal person and another party (usually between an employer and an employee)" (Rousseau, 1989, p.123). Employees usually expect to be treated fairly as human beings, to be provided with the work that uses their abilities, to be rewarded equitably in accordance with their contribution, to be able to display competence, to have opportunity for further growth and to know what is required from them.

The PC has several basic characteristics that distinguish it from the legal employment contract. The first basic characteristic is that PC is not documented and has very intangible nature (Chahar, 2019). Other important characteristics of PC are that it has perceptual nature, it is based on promises, the elements which the PC consists of have reciprocal nature, it has a dynamic nature, expectations which PC consists of are conditioned by previous experience, etc. (Rousseau, 1995; Anderson, 1998; Davidson, 2002).

Speaking of the types of PC, there are several classifications that could be found in the literature. Firstly, PC could be seen as the "old" one and the "new" one. The basic characteristic of the "old" PC is that employees who form this type of PC believe that if they work hard, adequately fulfil their obligations to the employer and contribute to the achievement of company's goals, can count on job security (Dunahee & Wangler, 1974; Rousseau 1989; Sims, 1994; Makin et al. 1996; Singh, 1998). However, after 80s of the 20th century, when many companies went through mergers, acquisitions and downsizing processes (and consequently many employees were laid off), employees started to form the "new" form of PC (Milanović et al., 2018). Its fundamental characteristic is that employees cannot count on job security any more. They realized that the best that they can get from the employers are fair salary and opportunities for personal growth (Sims, 1994; Robinson et al., 1994; Kissler, 1994; Sparrow, 1996; Hiltrop, 1996; Schalk & Roe 2007).

Beside the mentioned classification of PC, the classification of the elements of which PC dominantly consists of is also very well-known in the literature. Accordingly, there are two additional types of PC: transactional and relational (MacNeil, 1980; Rousseau, 1990; Robinson et al., 1994). Relational contact reflects employees' affective involvement and beliefs in organizations that they will provide guarantees for employees' career

development, respect, support, etc. In turn, the employees offer loyalty and commitment to the organization's needs and interests. Based on this, when it is about the OCB, which also assumes positive attitudes regarding organization, it is reasonable to expect that the employees who develop relational PC demonstrate OCB as well. Therefore, the hypotheses that are going to be tested in our research are as follows:

H1: There is a positive relationship between relational PC and OCB of employees.
H2: There is the positive impact of PC on OCB of employees.

In contrast to relational PC, transactional contract is based on the material benefits. The employees who form this type of PC do not become the organizational members really but they are only concerned about the short-term material rewards and personal benefits (Kiskohumar, 2019). Closed-ended time frame, exchange of economic resources, unambiguous performance standards and limited mutual investment between employer and employees are also the basic characteristics of transactional contract (Robinson & Morrison, 1995). Since the employee who forms transactional PC has no obligation to remain within the organization and perform only a limited or fixed set of duties, it is reasonable to expect that they do not demonstrate OCB. Therefore, additional hypothesis that are going to be tested in the research are as follows:

H3: There is negative relationship between transactional PC and OCB of employees.
H4: There is the negative impact of transactional PC on OCB of employees.

Since Serbia had a long tradition of socialism, which assumes paternalistic relationship toward employees, it is reasonable to expect that in most cases employees (in our research academic professors) form relational PC. Therefore, our next hypothesis is:

H5: Academic professors rank relational PC higher than transactional PC.

2. Methodology of Research

Context of the research. The research has been conducted on the sample of academic professors at state universities and higher schools on the territory of the Republic of Serbia. In Serbia there are eight state universities. The participants of the study were the professors of two universities (University of Novi Sad, which is at the north of Serbia, and University of Niš, which is at the south of Serbia) and one higher school.

Research variables and instruments. Regarding the PC, we used the questionnaire Psychological Contract Scale developed by Millward and Hopkins (1998) and later adapted by Raja et al. (2004). Raja et al. (2004) measured two components of PC, transactional and relational, with 9 items per each category. Furthermore, a sixteen-item measure (based on the work of Podsakoff et al. (1990), Podsakoff and MacKenzie (1994) and adapted by Shahzad (2011) was used to access OCB. Participants were asked to access all the items in the questionnaire on five-point Likert scale, ranging from 1 – strongly disagree, to 5 – strongly agree. In both questionnaires, reversed coding was applied with the aim of getting the same direction of items. Reliability test by comparing the value of the coefficient Cronbach Alpha with the criteria of a minimum value of 0.6, defined by Griethuijsen et al. (2014), showed the value of 0.85 for relational PC and 0.73 for OCB, all above the threshold. After excluding two items for transactional PC, acceptable level of Cronbach Alpha coefficient of 0.65 was achieved.

Data collection techniques and instruments. The authors distributed 120 questionnaires in paper form during the winter semester of school year 2018/2019. Four faculties (from two universities) and one higher school took part in the research. The response rate was 80.83% with no missing data and, thus, all returned questionnaires were used in the research.

The sample characteristics. The demographic characteristics of the respondents are presented in the Table 1.

Table 1 Respondent Characteristics

Variable	Frequency	Percent
Gender	97	100
Male	40	41.2
Female	57	58.8
Age	97	100
<30	15	15.5
31-40	36	37.1
41-50	26	26.8
51-60	13	13.4
>61	7	7.2
Work experience	97	100
<5 years	15	15.5
6-15 years	37	38.1
16-25 years	29	29.9
> 26 years	16	16.5
Position	97	100
Full Professor	19	19.6
Associate Professor	22	22.7
Assistant Professor	17	17.5
Assistant	36	37.1
Teaching Associate	3	3.1

Source: Authors' calculations

Analyses and procedures. The IBM program SPSS, version 23 was used in order to analyse obtained data. For the purpose of testing proposed hypothesis, t-test, Pearson correlation and multiple linear regression analysis were applied. According to Cohen (1992), Pearson correlation coefficient values of ± .10 represent a small effect, ± .30 is a medium effect and ± .50 is a large effect.

3. THE RESULTS AND DISCUSSION

This section provides the findings and discussion on relationship and influence of two types of PC (relational and transactional) on OCB of academic professors participated in the research.

Table 2 Descriptive statistics of the researched variables

Variable	N	Minimum	Maximum	Mean	SD	SE
Transactional PC	97	1.00	3.86	1.93	.53	.054
Relational PC	97	1.89	4.44	3.34	.53	.053
OCB	97	3.06	5.00	4.17	.39	.393

Source: Authors' calculations

Table 2 shows that the mean value for transactional PC was 1.93 (SD = 0.53) indicating relatively low level of reciprocal transactional obligations between an employee and his or her organization. On the other hand, the mean value of relational PC is 3.34 (SD = 0.53) showing relatively high level of relational PC. OCB has mean value of 4.17 (SD = 0.39) indicating relatively high level of OCB among academic professors. All standard deviations have values on acceptable level.

In order to test the first and the third hypothesis, the correlation between transactional PC, relational PC and OCB were calculated.

Table 3 Correlations between researched variables and reliabilities [a]

Variable	1	2	3
1. Transactional PC	(.65)		
2. Relational PC	-.267**	(.85)	
3. OCB	-.510**	.497**	(.73)

[a] n= 97; alpha reliabilities are given in parentheses
**. Correlation is significant at the 0.01 level (2-tailed).
Source: Authors' calculations

Table 3 shows that the Pearson correlation coefficient is $r = -0.510$ ($p < 0.01$, large practical effect) indicating that there is a negative correlation between transactional PC and OCB of academic professors. The same analysis revealed positive ($r = 0.497$) and statistically significant correlation ($p < 0.01$, medium practical effect) between relational PC and OCB of professors participated in the research.

Previous analysis indicates that the hypothesis H1, defined as that there is a positive relationship between relational PC and OCB of employees is confirmed. Also, the hypothesis H3, which proposed that there is a negative relationship between transactional PC and OCB of employees, is confirmed. More precisely, the previous analysis showed that when the level of relational PC increases, the level of OCB increases as well and when the level of transactional PC increases, the level of OCB decreases.

In order to test the second and the forth hypothesis, multiple linear regression analysis was applied to investigate if there is the effect of relational and transactional PC on OCB (Table 4).

Multiple linear regression analysis (Table 4) displays R value of 0.633. R Square = 0.401 indicating that components of PC are influencing 40.1% of change in OCB of academic professors. F statistics is 31.452, statistically significant at the level of 0.000 ($p < 0.05$) indicating that there is a model fit between independent variables and dependent variable. Regression coefficients for transactional PC ($B = -0.296$; $p < 0.05$) and for relational PC ($B = 0.286$; $p < 0.05$) imply that these variables significantly contribute to the OCB of respondents. Hence, the regression equation for OCB can be written as follows:

$$OCB = 3.783 - 0.296\ (\text{Transactional PC}) + 0.286\ (\text{Relational PC}) \quad (1)$$

Table 4 Regression analysis of studied variables

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.633[a]	.401	.388	.30325	.401	31.452	2	94	.000

a. Predictors: (Constant), Transactional PC, Relational PC

ANOVA [a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.785	2	2.892	31.452	.000[b]
	Residual	8.645	94	.092		
	Total	14.429	96			

a. Dependent Variable: OCB
b. Predictors: (Constant), Transactional PC, Relational PC

Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	3.783	.263		14.405	.000	3.262	4.305		
	Transactional PC	-.296	.060	-.406	-4.906	.000	-.416	-.176	.929	1.077
	Relational PC	.286	.061	.389	4.694	.000	.165	.408	.929	1.077

a. Dependent Variable: Organizational citizenship behaviour
Source: Authors' calculations

Due to significant correlation between independent variables (Table 3), Tolerance and VIF tests were applied. Their values are on the acceptable level, VIF<10 and Tolerance> 0.1, thus there is not a problem of multicollinearity among these variables (Field, 2009).

It can be concluded that hypotheses H2 stated as that there is the positive impact of relational PC on OCB, and H4 that there is the negative impact of transactional PC on OCB are also confirmed.

The results of our research are moderately in line with the results of other authors who investigated the relationship between different types of PC and OCB. Our research is similar to Mai et al. (2016). They found significant correlations between transactional PC ($r = -0.37$, $p < 0.01$) and relational PC ($r = 0.50$, $p < 0.01$) with OCB. Kishokumar (2018) identified that relational PC and OCB were positively correlated ($r = 0.825$, $p < 0.01$). Contrary to our findings, Kishokumar (2018) revelled that transactional PC is positively related with OCB ($r = 0.814$, $p < 0.01$). Similarly to this research, relationship between transactional PC and OCB was positive ($r = 0.158$, $p < 0.05$) and also between relational PC and OCB ($r = 0.198$, $p < 0.001$) in research of Byoung et al. (2014). Concerning the effects of transactional PC and relational PC, Byoung et al. (2014) proved that the positive relationship between organizational identification and OCB will be stronger when the transactional contract is low and when the relational contract is high. More extended research of Hui et al. (2004) has shown that transactional and relational PC were positively

related with all five components of OCB: altruism, conscientiousness, civic virtue, courtesy, sportsmanship. Furthermore, the transactional PC had a direct effect on OCB, but relational PC did not. It predicted instrumentality, which in turn predicted all OCB components. Findings of Lub et al. (2011) indicate that both transactional PC ($r = 0.235$, $p < 0.05$) and relational PC ($r = 0.363$, $p < 0.01$) are positively related with OCB. Regression analysis showed that 27% of variance in OCB was due to change in transactional and relational PC, but only regression coefficient for relational PC was statistically significant and positive ($B = 0.37$, $p < 0.01$).

In order to test the hypothesis H5 we conducted t-test to compare values of relational and transactional PC with defined test value of 3. The results have shown that academic professors rank relational PC ($t = 6.474$, $df = 96$ $p = 0.000$) higher than transactional PC ($t = -19.719$, $df = 96$, $p = 0.000$) indicating that hypothesis H5 is confirmed.

These findings indicate that academic professors vastly rate relational PC, which is positively related with their OCB. Since the transactional PC is negatively related with OCB, variations in OCB of academic professors are explained by positive effect of relational and negative effect of transactional PC.

CONCLUSION

Organizational citizenship behaviour is a form of employees' behaviour which is very beneficial for the employers. It could result in increasing of the individual performances and in enhancement of the overall organizational performances. Therefore, this form of behaviour is very desirable in working place. However, it is influenced by the set of factors among which the fulfilment of the psychological contract is one of the most important ones.

In this paper, the relationship between PC types and OCB was analysed. After presenting the theoretical background of these concepts, the results of the empirical study were presented and analysed. The study has been conducted on the sample of academic professors at state universities in Serbia. Since they work in relatively stable environment and certain percentage of professors had lived partly in socialism, the authors of the paper assumed that the dominant form of psychological contract that they develop is relational. The authors also assumed that there is positive relationship and positive impact of relational PC on OCB of respondents. On the other hand, when it is about the transactional contract, the assumption was that there is negative relationship and negative impact on organizational citizenship behaviour. The results of the study showed that all proposed hypothesis are confirmed.

However, there are some limitations of this study. Firstly, the research sample was dominated by academic professors. Research on a more diverse sample is required to gain more reliable results. Secondly, because of the small sample, generalizations of the relationship between PC type and OCB of employees in Serbia could not be made. But regardless of these limitations, the information gained from this research could be beneficial, first of all, for those universities participating in the study in order to improve some human resource management practices and communicational channels. As final consequences of that will be the fulfilment of PC of employees at higher level which will bring many positive consequences in working environment.

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ISTRAŽIVANJE UTICAJA VRSTA PSIHOLOŠKOG UGOVORA NA ORGANIZACIONO PONAŠANJE

Organizaciono građansko ponašanje predstavlja ponašanje zaposlenih koji prevazilazi njihove dužnosti. Ovakvo ponašanje iz perspektive poslodavca je veoma poželjno, jer donosi mnoge pozitivne posledice u pogledu individualnih i ukupnih organizacionih performansi. Međutim, na spremnost zaposlenih da ispoljavaju ovakvu vrstu ponašanja utiču mnogi faktori. Jedan od najvažnijih je ispunjenje psihološkog ugovora zaposlenih. Pošto postoje dva osnovna oblika psihološkog ugovora, relacioni i transakcioni, cilj ovog rada je da istraži odnos između ovih vrsta ugovornog organizacionog građanskog ponašanja. U svrhu testiranja predloženih hipoteza, primenjeni su t-test, Pirsonova korelacija i višestruka linearna regresiona analiza. Rezultati su pokazali da postoji pozitivan odnos i pozitivan uticaj relacionog psihološkog ugovora na organizaciono građansko ponašanje, što nije bio slučaj kada je reč o transakcionom ugovoru.

Ključne reči: *relacioni psihološki ugovor, transakcioni psihološki ugovor, organizaciono građansko ponašanje, zaposleni.*

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CREATIVE ACTIVITIES VALUATION USING A TOPSIS – BASED DECISION SUPPORT ALGORITHM

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Emilia Madudova[1], Zuzana Palencikova[2]

[1]University of Žilina, Faculty of Operation and Economics of Transport and Communications, Department of Communications, Slovak Republic
[2]Constantine the Philosopher University in Nitra, Faculty of Central European Studies, Department of Tourism, Slovak Republic

Abstract. *The main goal of the paper is the creative activities valuation using a TOPSIS based decision support algorithm. As defined by Cutler & Carmichael (2010) tourist experience remains in memory, preceded by motivations and expectations and result in satisfaction or dissatisfaction. The creative tourism is not well developed in the Slovak Republic yet, and there is no theoretical evidence what kind of creative tourism activities the tourists are most interested in. As the results show, tourists very strongly prefer creative tourism activities connected to education. The results also show that tourists do not connect creative activities with tourist destinations, which should result in a more involved supply side in the future, with the support of the local economy and sustainability, including the crafts, art and local culture.*

Key words: *creative tourism, tourism, tourism development, competitiveness TOPSIS*

JEL Classification: L83, Z32, Z19

1. INTRODUCTION

Products and services are no longer enough to generate economic prosperity. Therefore, "organizations use the experience as a management tool for differentiation" (Pine & Gilmore, 1998). Experiences are "subjective, highly personal and intangible phenomena" (Billing & O'Dell, 2010), hence, difficult to define and to grasp their essence. The tourist

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Corresponding author: Emilia Madudova
University of Žilina, Faculty of Operation and Economics of Transport and Communications, Department of Communications, Univerzitná 8215/1 010 26 Žilina, Slovak Republic
E-mail: emilia.madudova@fpedas.uniza.sk

experience "remains in the memory, preceded by motivations and expectations, and results in satisfaction or dissatisfaction" (Cutler & Carmichael, 2010).

The research of Coelho et al. (2018) shows, that "the experiences seem to arouse a set of emotions and not just an isolated one. Furthermore, memorable experiences have resulted primarily in positive emotions, to the inward (reward, freedom) or outward (joy, happiness, enthusiasm, liveliness)". Figure 1 illustrates the kind of emotions arising from memorable tourism experiences.

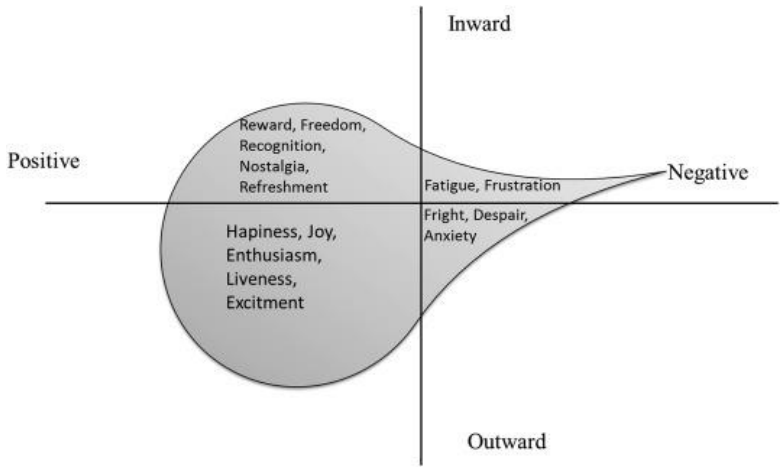

Fig. 1 Representation of the types of emotions of Memorable Travel Experiences
Source: Coelho et al. 2018

Tan et al (2013) consider experience as "a process that tourists need to go through to achieve creativity". They integrate six categories of experiences into four themes: 'consciousness/awareness', 'creativity', 'needs', and 'learning and interacting', as shown in Figure 2. "The first three are named 'inner reflection's as the reflexive process happens to the inner-self; and the final theme is named 'outer interactions, because tourists are interacting with outside factors, such as the environment, people, and product/service/ experience. In addition, 'consciousness/awareness' is a prerequisite of creative experience, and the tourists must have a sense of this (whether individual, social, cultural or environmental)" in order to have a creative experience, as this differentiates these from other experiences. The findings show that 'outer interactions' and 'inner reflections' together construct the model of 'creative experience'.

This is consistent with the view that 'self-actualization, learning, creativity, and needs operate in a synergistic cycle' (Burleson, 2005), as well as Hanifl's idea that people are creating, designing, selecting and reflecting upon their creative experiences (2015).

In order to understand the origins of creative tourism, one needs "first to look at the rise of culture as a form of tourism consumption" (Richards, 2013; Carvalho et al., 2019; Csapó 2012). The characteristics of tourism's current consumption demonstrate that it has increasingly acquired a diverse, multidimensional and (micro) segmented character,

corresponding to broader use of culture (Jelincic, 2009). "Understanding the role of creativity in the tourism industry, and how it contributes to creative experiences, is both challenging and complex. Creativity can be seen in multiple dimensions: everyday creativity, artistic creativity, and intellectual creativity" (Ivcevic & Mayer, 2009).

Tourists stand to benefit from stretching their capabilities and learning new skills, possibilities which work pressures in the home environment often leave little time for. People increasingly feel a need to distinguish themselves in a homogenized world and are becoming more curious about the relative process (Richards & Raymond 2000).

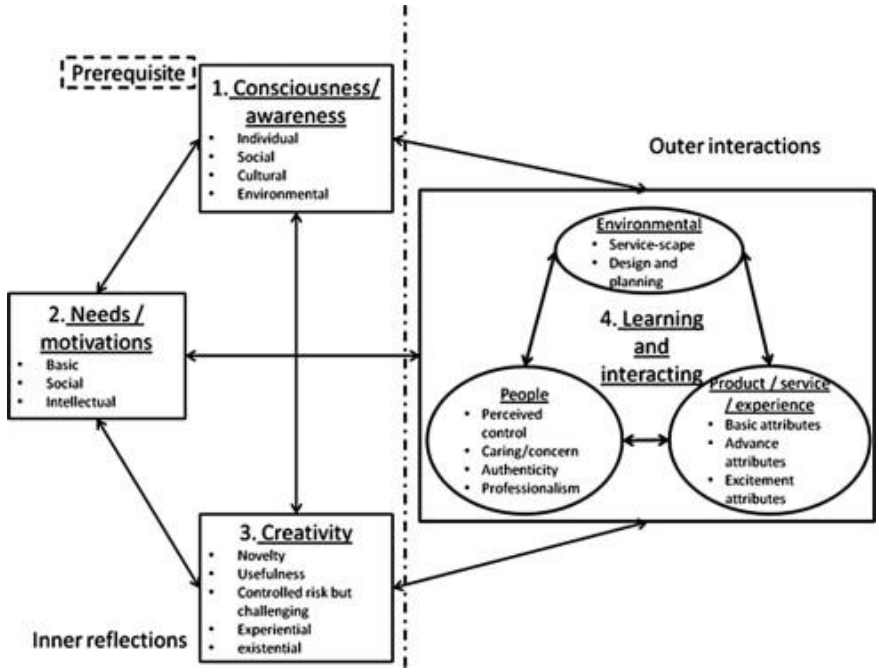

Fig. 2 A model of creative experience
Source: Tan et al. 2013

Creative tourism stands for the acquisition of certain skills during holidays, which becomes a part of the culture and community of a target country. UNESCO´s Creative Cities Network (2006) understands "creative tourism as travel directed toward an engaged and authentic experience, with participative learning in the arts, heritage, or special character of a place" in connection with residents. "Tourists develop their creative potential and become closer to the local community through informal participation in interactive seminars and acquisition of experience" (Raymond, 2007). "Creative tourism is a trip directly oriented towards participation and acquisition of authentic experience, gaining certain knowledge in the field of arts, heritage and particular kind of locations where immediate communication with the local community is possible, which would allow creating a 'live' culture" (Maisel, 2009).

"Creative tourism can be seen in numerous situations where visitors, service providers, and the local community exchange ideas and skills and influence each other in a synergetic way. In this sense, creative tourism can be (Richards & Marques 2012):

- a means of involving tourists in the creative life of the destination,
- a creative means of using existing resources,
- a means of strengthening identity and distinctiveness,
- a form of self-expression/discovery,
- a form of edutainment –self-realization and education,
- a source of „atmosphere" for places,
- a source of recreating and reviving places."

Even though creativity is seen as the base of creative tourism, the creative factors of creative tourism systems remain unexplored. Furthermore, the current definitions of creative tourism are all supply-led, such as by tourism boards, service providers, and various industry practitioners, without considering the tourists' viewpoint although tourists are seen as co-creators of the experiences.

As Kaufman & Baer (2012) ask, who decides what is creative? However, according to Tan et al. (2013) all creativity assessments are "expert-based, and may not be applicable for ordinary people, especially the research studies often examine artistic creative dimensions that are unreachable by lay people, such as tourists, who just want to enjoy something that is original or authentic in common life settings and related interactions."

Nature of creative supply is synergetic and it lies in the offer of creative activities by "locals" (service providers, creative communities) through which visitors can develop their creative potential and locals can improve their position on the market place (Hrubalova & Palencikova, 2017).

"Although tourists are playing active roles in co-creating their experiences while on vacation, industry practitioners still take the lead when it comes to designing and providing such activities" (Raymond, 2007), with few studies considering what tourists actually want in this context. For example, Maitland (2008) studies the roles of tourists and residents in creative cities, while Maisel (2009) acknowledges that many tourists desire experiences that are small, intimate and on a human scale.

The original concept of Richards & Raymonds creative tourism (2000) with an emphasis on creative learning through attending courses and workshops while on holiday has shifted to the current concept of co-creation as co-makers between the visitors and the locals, to "living like local" experience integrating all aspects of tourist consumption at creative places/destinations (Palencikova, 2018).

There is a need for more analysis of creative tourism in the Slovak Republic, which draws on the tourists perspective, especially with regard to what kind of activities do tourists prefer and consequently, which of the activities will they go for. The paper also explores the assumption of Maisel (2009) that creative activity should be directly oriented towards authentic experience, knowledge connected with the location/region and the local community.

2. METHODOLOGY

The scope of the research was to evaluate the interest of Slovak tourists for creative tourism activities, to identify their selection criteria, using a TOPSIS based algorithm. A

questionnaire has been applied as the data collection instrument. Data from respondents were collected during the spring season 2019 (from January to May) in various tourist regions in Slovakia. The direct inquiry was carried out on a sample of 315 respondents from all the regions of the Slovak Republic, aged 15-75. The respondents were to mark the category (specification) connected with creative tourism activity related to importance. (Table 3).

TOPSIS is a bipolar comparison of each alternative under consideration with both the positive ideal (PIS) and the negative ideal (NIS) solutions. The distances to these two solutions are calculated for each alternative and then the aggregated criterion is built that combines these two factors and describes the quality of each alternative, assuming that the chosen alternative should have the shortest distance to the ideal solution and the farthest distance to the negative ideal one (Wachowicz, 2011).

In order to calculate the weights for the different criteria, the AHP (Analytic Hierarchy Process), introduced by Thomas Saaty (1996) has been applied. In this AHP, the pairwise comparison matrix A is built. The matrix A is an $m^x m$ real matrix, where m is the number of evaluation criteria considered. Relative importance between two criteria are measured according to a numerical scale from 1to 9. (Table 1)

The pairwise comparison was evaluated according to our survey (inquiry) results. The direct inquiry was carried out on a sample of 315 respondents from the Slovak Republic, aged 15-75 from all the regions of the Slovak Republic. The respondents were to mark the category (specification) connected with creative tourism activity related to importance. (Table 3).

Table 1 AHP criteria evaluation

Value _S_{ij}	Interpretation
1	i and j are equally important
3	i is slightly more important than j
5	i is more important than j
7	i is strongly more important than j
9	i is absolutely more important than j

Source: Authors

Each entry S_{ij} of the matrix A represents the importance of the *i*-th criterion relative to the *j*-th criterion. If $S_{ij} > 1$, then the *i*-th criterion is more important than the *j*-th, where $S_{ii} = 1$, $i = 1, 2, 3 \ldots, k$ and $S_{ji} = 1/ S_{ij}$.

Finally, the criteria weight vector v_i *(*that is an m-dimensional column vector*)* is built in three partial steps. (1) – (3),

$$S_i = \prod_{j=1}^{k} S_{ij} \tag{1}$$

where *k* in number of criteria, S_{ij} – is criteria,

$$R_i = (S_i)^{1/k} \tag{2}$$

$$v_i = \frac{R_i}{\sum_{i=1}^{k} R_i} \tag{3}$$

where, $j = 1, 2, \ldots, k$.

The TOPSIS algorithm consists of six subsequent steps:

1. Building the normalized decision matrix $R=(r_{ij})$,

$$r_{i,j} = \frac{y_{ij}}{\sqrt{\sum_{i=1}^{k} y_{ij}^{\ 2}}} \tag{4}$$

where $i = 1,2,3...k$, $j = 1,2,3...k$.

2. Computing the weighted normalized decision matrix. Each *j-th* column of R matrix multiply by v_j weight and calculate weighted normalized decision matrix W.
3. Determinig the positive ideal H_j and negative ideal D_j solutions, where $H_j = \max w_{ij}$, $j = 1,2,3...$, k and $D_j = \min w_{ij}$, $j = 1,2,3...$, k.
4. Calculating the separation measures (distance) for each alternative i and the best condition d_j^+ and distance from the target alternative i to the worst condition. d_j^-, the Euclidean distance is used:

$$d_i^+ = \sqrt{\sum_{j=1}^{k} | w_{ij} - H_j |^2} \text{ , for } i = 1, 2, ..., k \tag{5}$$

$$d_i^- = \sqrt{\sum_{j=1}^{k} | w_{ij} - D_j |^2} \text{ , for } i = 1, 2, ..., k \tag{6}$$

5. Determining the relative closeness of each alternative to the ideal solution:

$$c_i = \frac{d_i^-}{d_i^+ - d_i^-} \text{ , for } i = 1, 2, ..., k \tag{7}$$

6. Ranking the alternatives in descending order using c_i.

3. RESULTS

This section presents a numerical case study of creative tourism activities classification in the Slovak Republic to demonstrate the proposed creative activity selection algorithm.

Activities related to creative tourism in the Slovak Republic were divided into several categories. The main categories are events, courses, and workshops. The more detailed specification of activities is described in Table 2.

Table 2 Creative tourism activities

Category	Activity
Events with the theme of traditional crafts and folk art	a_1
Courses of traditional crafts and folk art	a_2
Gastronomic events with the theme of cooking local dishes and meals	a_3
Cooking courses of cooking local dishes and meals	a_4
Events associated with demonstrations of authentic folklore	a_5
Scenic Art Courses	a_6
Visual Art Courses	a_7
Workshops designed for children	a_8
Courses of recycling and production of organic products (Eco-friendly products)	a_9

Source: Authors

In order to compare selected activities, it is necessary to identify the criteria (Table 3), most characterizing the creative tourism activities. As described in the methodology, in contemplation of calculating the weights for the different criteria, the analytic hierarchy process with pairwise comparison was applied. In criteria evaluating, the results of the survey (more described in the methodology) were taken into account. Conforming to research (inquiry) results, respondents strongly favored creative tourism activity connected to education. Based on the results, the creative tourism activity should be funny and relaxing, authentic, unique and challenging. Destination, respectively linking to a particular location is not a key factor in the choice of creative tourism activity for respondents.

Table 3 Creative tourism activity selection criteria

Criterion description	Criterion name	Category	Survey
▪ Educate, ▪ learn to unfold skills and techniques, ▪ acquire or develop new skills.	EDUCATION	K_1	Very strongly preferred
▪ Be funny	FUN AND RELAXATION	K_2	Strongly preferred
▪ Referring to the location, ▪ a better understanding of the local culture, ▪ become closer to the local community.	LINKED TO DESTINATION	K_3	Weakly preferred
▪ Be unique and extraordinary, ▪ enable to get an authentic experience.	AUTHENTIC AND UNIQUE	K_4	Strongly preferred
▪ Challenging and unusual.	CHALLENGE	K_5	Strongly preferred

Source: Authors

In the next step, the pairwise comparison matrix was built (Table 4). Relative importance between two criteria was measured according to a numerical scale from 1 to 9 and according to survey results. Each criterion was evaluated according to survey results (methodology).

Table 4 Pairwise comparison of creative tourism activities

Criterion	K_1	K_2	K_3	K_4	K_5	S_i	R_i	v_i
K_1	1	9	9	9	9	6.561	5.78	0.60
K_2	0.111	1	3	5	3	4.995	1.38	0.15
K_3	0.111	1	1	7	1	0.777	0.95	0.10
K_4	0.111	1	1	1	3	0.333	0.80	0.08
K_5	0.111	1	1	1	1	0.111	0.64	0.07
$\sum$							**9.55**	**1**

Source: Authors

Results of a pairwise comparison evaluated according to survey results present value v_i in a column of Table 4. Conforming to (Table 3) and the v_i weights, the greatest weight is the education creative tourism activity, resp. creative tourism activity is linked with education (in survey very strongly preferred as well), subsequently the funny and relaxation activities, authentic and unique activities and challenging activities (in survey results strongly preferred). These activities are approximately of the same weight v_i (Table 4).

Weighted normalized decision matrix W is presented in Table 5. Table 5 presents the ideal H_j solutions, which present the highest values of each criterion and D_j solutions, which present the lowest values of each criterion. The resulting values c_i are shown in Table 6.

Table 5 Weighted normalized decision matrix W

Activity	K_1	K_2	K_3	K_4	K_5
a_1	0	0.061	0	0.046	0
a_2	0.245	0.061	0.05	0	0.029
a_3	0	0	0	0.046	0
a_4	0.245	0.061	0	0	0.029
a_5	0	0.061	0.05	0.046	0
a_6	0.245	0	0	0	0.029
a_7	0.245	0.061	0.05	0	0.029
a_8	0.245	0.061	0	0	0.029
a_9	0.245	0	0.05	0	0.029
v_i	0.60	0.15	0.10	0.08	0.07
Hj	0.245	0.061	0.05	0.08	0.029
Dj	0	0	0	0	0

Source: Authors

Table 6 Relative closeness of each alternative to the ideal solution

Activity	d_{i+}	d_{i-}	c_i
a_1	0.795	0.077	0.088
a_2	0.077	0.259	0.771
a_3	0.797	0.045	0.053
a_4	0.089	0.257	0.743
a_5	0.793	0.089	0.101
a_6	0.114	0.247	0.684
a_7	0.077	0.259	0.771
a_8	0.095	0.253	0.727
a_9	0.100	0.251	0.715

Source: Authors

Multi-criterion analysis using the TOPSIS method, evaluate five criteria. These criteria were ranked according to the TOPSIS method (Table 7). The best ranked creative tourism activities are courses, then events and least attractive events.

Table 7 Tourism creative activities results

Ranking	Activity	Activity description	c_i
1.	a_2, a_7	Courses of traditional crafts and folk art Visual Art Courses	0.771
2.	a_4	Cooking courses of cooking local dishes and meals	0.743
3.	a_8	Workshops designed for children	0.727
4.	a_9	Courses of recycling and production of organic products (Eco-friendly products)	0.715
5.	a_6	Scenic Art Courses	0.684
6.	a_5	Events associated with demonstrations of authentic folklore	0.101
7.	a_1	Events with the theme of traditional crafts and folk art	0.088
8.	a_3	Gastronomic events with the theme of cooking local dishes and meals	0.053

Source: Authors

4. Conclusion and Discussion

The paper evaluates selected creative tourism activities in the Slovak Republic using TOPSIS methodology considering evaluation criteria. These creative tourism activities were evaluated according to the realized survey, where respondents figured out the most important criteria, which met the requirement of creative tourism activity.

The research results show that creative tourism activities should be primarily educational. Strongly important for respondents are activities that are funny, relaxing, authentic and unique and challenging. Respondents did not confirm the need to link creative tourism activities to a destination.

These results confirm the importance of support to creative tourism activities that are linked to education, for example courses of traditional crafts and folk art, unconventional cooking courses, scenic art courses and visual art courses (Table 7) in the Slovak Republic. To the contrary, creative tourism activities should "allow tourists to learn more about the local skills, expertise, traditions and unique qualities of the places they visit" (Richards & Wilson, 2006), so it is a challenge for the supply side (in Slovak destinations) to provide courses connected with local culture, heritage and local people and improve local development through creative tourism´s development opportunities.

Table 8 evaluates the creative tourism activities in relation to the theoretical background more described in the introduction. Activities targeting different kinds of courses also meet the conditions (Tan et al. 2013) of creative experiences as consciousness, motivation, creativity, and learning.

Table 8 Creative tourism activities evaluation in relation to the theory

Activity	Tourism Experience	Influence
▪ Cooking courses of cooking local dishes and meals ▪ Workshops designed for children ▪ Courses of recycling and production of organic products (Eco-friendly products)	▪ Reward ▪ Refreshment ▪ Happiness ▪ Liveness ▪ Enthusiasm ▪ Liveness	▪ Involving tourists in the creative life ▪ Means of strengthening identity and distinctiveness ▪ Form of edutainment ▪ Source of recreating and reviving the domestic culture
▪ Scenic Art Courses ▪ Visual Art Courses	▪ Freedom ▪ Nostalgia ▪ Enthusiasm ▪ Excitement	▪ Involving tourists in the creative life ▪ Form of self-expression/discovery ▪ Form of edutainment
▪ Events associated with demonstrations of authentic folklore (folk art) ▪ Gastronomic events with the theme of cooking local dishes and meals	▪ Recognition ▪ Refreshment	▪ Creative means of using existing resources ▪ Means of strengthening identity and distinctiveness ▪ A source of „atmosphere for the place" ▪ Source of recreating and reviving the domestic culture

Source: Authors

The global tourism market has been experiencing immense changes in the last decade, mainly due to the globalization and technological advances both in terms of demand and supply. Changes are creating a lot of new opportunities as well as challenges for all tourism stakeholders (Palencikova, 2018).

By knowing which activities attract tourists the most, tourists can maximize their creative experience by searching for what they want from the range of creative tourism experiences on offer. The paper also describes the key elements that can increase the level of creativity in the creative experience process, and the most important criteria for the demand side that creative activities should fulfill. Since there are relatively few studies examining these issues in the Slovak Republic, the current research aims to address these gaps in the current literature.

In order to understand the origins of creative tourism demand, in the Slovak Republic we looked at the tourism consumption. Creative tourism is not largely expanded in the Slovak Republic. There is a good tourism development in the Slovak Republic, but edification, resp. propagation of creative tourism must be improved; both in terms of demand (information dissemination) and supply (information dissemination, activities that attract tourists) as well. As research shows, to ensure the competitiveness of the Slovak Republic in the creative tourism market on the supply side, the Slovak creative tourism industry needs to focus mainly on courses and workshops (courses of traditional crafts and folk art, visual art courses, cooking courses of cooking local dishes and meals) and not focus only on events. Tourists tend to benefit from learning new skills; the activities of the creative tourism should be directly oriented towards authentic experience, knowledge dissemination, connected with the local community, but not necessarily connected with location or destination.

In the future research, authors will focus on concrete courses, workshops, and activities that attract and interest tourists in concrete tourist regions. Future research on creative tourism development should also involve opinions of destination management organizations, that represent the "orgware" of creative tourism supply and in-depth interviews with their managers. Furthermore, understanding the preferences of creative tourists and specifics of creative supply in various tourist regions within Slovakia may serve to achieve greater acceptance of creative tourism as a new form of tourism development in Slovakia and include creative tourism in tourism development strategies in the near future.

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EVALUACIJA KREATIVNIH AKTIVNOSTI NA OSNOVU TOPSIS- ZASNOVANOG ALGORITMA ZA PODRŠKU ODLUKAMA

Glavni cilj ovog rada je evaluacija kreativnih aktivnosti uz pomoć algoritma za podršku odlukama zasnovanom na TOPIS metodi. Kao što su Cutler & Carmichael (2010) definisali, turistička iskustva ostaju u sećanjima, prethode im motivacija i očekivanja a rezultiraju u zadovoljstvu ili nezadovoljstvu. Kreativni turizam još uvek nije dovoljno razvijen u Republici Slovačkoj, i nema teoretskih dokaza za vrstu aktivnosti u kreativnom turizmu za koje bi turisti bili najzainteresovaniji. Kako rezultati pokazuju, turisti preferiraju one aktivnosti kreativnog turizmna koje su povezane sa obrazovanjem. Rezultati takođe pokazuju da turisti ne povezuju kreativne aktivnosti sa turističkim destinacijama, što bi trebalo da rezultira u boljoj ponudi u budućnosti, uz podršku lokqalne ekomonije i održivosti, uključujući zanatstvo, umetnost i lokalanu kulturu.

Ključne reči: *kreativni turizam, turistički razvoj, konkurentnost, TOPSIS*

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SIGNIFICANCE OF INNOVATION FOR SUSTAINABLE ECONOMIC AND AGRICULTURAL DEVELOPMENT IN THE REPUBLIC OF SERBIA

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Danijela Despotović, Lela Ristić, Miloš Dimitrijević

University of Kragujevac, Faculty of Economics, Kragujevac, Republic of Serbia

Abstract. *Since it is not enough just to achieve economic development, we should strive for sustainable development over a longer period and base it on innovation. It is an extremely important factor of economic and sustainable development. It is particularly important to innovate those economic activities that are crucial for sustainable development and where there are comparative advantages. Because of that, the aim of this paper is to prove that innovation is the key to success and achieving sustainable development. The cluster analysis has highlighted innovative leaders and learners. The Republic of Serbia is a country where agriculture is one of the most important economic activities. In terms of agricultural productivity, it not only lags behind innovative leaders, but also behind other countries of Southeast Europe, distinguished as innovative learners. In addition, in terms of innovation in agriculture, it significantly lags behind other economic activities at the national level, so that special attention should be paid to this issue.*

Key words: *innovation, productivity, sustainable development, economic development, agriculture.*

JEL Classification: 011, 013, 031, Q01

1. INTRODUCTION

In the modern world, it is very difficult to find a unique pattern of progress and the survival of a certain acceptable state for a longer period. That is why this is the time of new ideas, innovations and constant changes.

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Corresponding author: Miloš Dimitrijević
University of Kragujevac, Faculty of Economics, Liceja Kneževnine Srbije 3, 34000 Kragujevac, Serbia
E-mail: mdimitrijevic@kg.ac.rs

Innovation, together with the knowledge that enables it, is an important factor in increasing competitiveness (Dajić, 2017). Innovation is the key for economic development and increasing employment, which means that this is a very important determinant of sustainable economic development (Despotović et al., 2014).

It is not enough to achieve only economic development, but it is necessary for this development to be sustainable over a longer period, with respect to the ecological and social component. Because sustainable development is a multidimensional concept that relies on all three pillars (Giddings et al., 2002): economic, environmental and social.

Historically, the concept of sustainable development has emerged in the context of environmental problems. Interaction of investments in industrialization and agricultural production, exhaustion of natural resources, increase in the population are just some of the elements that are analyzed and based on which proposals are given for mitigation and solving of environmental problems (Miltojević, 2011, p. 641).

In accordance with the previously mentioned concept of sustainable development, the subject of research in this paper is the relationship between innovation and sustainable development in more economically developed and innovative countries (Germany, USA, Switzerland, Taiwan, Sweden, Japan, UK, Korea, Netherlands, Finland) and countries of Southeast Europe (Slovenia, Croatia, Greece, Romania, Bulgaria, Montenegro, Albania, Bosnia and Herzegovina, Serbia, North Macedonia), with a special accent on Serbia.

The aim of the paper is to prove that new ideas and innovations are necessary for a sustainable development of the economy and agriculture, which can be born only with greater investment and dedication to science, research and development.

Based on the subject and aim of the research, a hypothetical framework is defined:

X_1: Innovative countries are developing more rapidly.

X_2: Innovation is a very important factor for the future development of agriculture in the Republic of Serbia.

2. LITERATURE REVIEW

In addition to research and development (R&D), the growth and innovation capacity of the economy depends on the ability to absorb technology and the demand for its production and use (Radošević, 2004, p. 646). Innovative activities include internal and external R&D, capital expenditure, human resources development, market design and development, etc. (Gault, 2018, p. 618).

The most innovative countries are considered innovative leaders, while the least innovative are innovative learners. Despotović et al. (2016) indicate that the most innovative economies are mainly economically developed countries.

In the innovation segment, the Republic of Serbia should further encourage the development of patents, improve the quality of scientific and research institutions, and at the same time eliminate weaknesses in the connection between science and the economy (Savić et al., 2015, p. 74).

The competitiveness of a nation depends on the ability of its economy to innovate and improve (Porter, 2008, p. 159). This is particularly important if it positively reflects the dimensions of sustainable development, which could best be seen if sustainable development indicators are considered, such as Human Development Index (HDI) and Ecological Footprint vs Biocapacity per person (Moran et al., 2008). The ecological footprint should be less than

bioaccumulation. Since this has not been the case in Serbia for years, then there is an ecological deficit (Global Footprint Network, 2018). It is important to point out that HDI (UNDP, 2005) is used as an indicator of sustainable development, and Ecological footprint (Wackernagel et al., 2002; Wackernagel et al., 2005) as an indicator of sustainable consumption. As a minimum, sustainability requires the avoidance of a global overdraft, or the relationship of the Ecological relationship to bioaccumulation greater than 1, thus ≤ 1 is a necessary condition for sustainability (Ceballos et al., 2005).

Although the significance of GDP is inseparable in economic publications, composite indexes that integrate multiple indicators, such as HDI, the Global Competitiveness Index and others, are increasingly used (Gligorić et al., 2018, p. 1254). Legatum Institute Prosperity Index (LPI) is a relatively newer and more comprehensive indicator that uniquely describes the level and dynamics of prosperity in countries around the world (Gligorić et al., 2018), according to which Serbia is 56th (Legatum Institute, 2018).

Serbia needs to adapt the development strategy to the new development and technological paradigm in order to establish an innovative environment (Bošnjak, 2005a, p. 33). A key element for establishing a more functional interaction between the R&D institutions and the economy is the establishment of a balanced program of long-term technological development that will be complementary to strategic development priorities, especially in the context of integration processes in the European Union (Jakopin, 2011, p. 85). In addition, the acceptance of the new concept of creating and maintaining competitive advantages based on scientific knowledge and technological development is necessary (Bošnjak, 2005b, p. 131).

As the most important analytical framework for expressing the achieved level of economy innovation is using the Global Innovation Index (GII) and the 12th pillar of the Global Competitiveness Index (GCI) (Despotović et al., 2014). In the research of innovation activities, the elements of the 12th Pillar of the GCI are used (Innovation as an innovation indicator): Capacity for innovation, Quality of scientific-research institutions, R&D costs of the company, University-industry cooperation in R&D, Government procurement of advanced technology products, Availability of scientists and engineers per million population (World Economic Forum, 2013, p. 51; Krstić et al., 2019, p. 20).

Innovation is considered the main driver of growth. The global median of the pillar Innovative Capabilities is 36 (out of 100), which is by far the lowest score in 12th pillars of GCI. In 77 countries of 140 Innovation is the weakest pillar. The results show that there are only a few innovation forces in the world, i.e. super innovators whose score is above 80: Germany, USA, Switzerland and Taiwan (China) (Schwab, 2018, p. 7). According to an innovative system based on business sophistication and innovative capability, Europe and North America are predominant (Schwab, 2018, p. 25).

Of the 140 analyzed countries according to the latest Report of the World Economic Forum in 2018, and to the 12th pillar of the GCI, innovation leading countries are: Germany (87.5), USA (86.5), Switzerland (82.1), Taiwan (China) (80.8), Sweden (79.8), Japan (79.3), UK (79.2), Korea (78.2), Netherlands (77.5) 76.3), France (76.1), Denmark (75.4), Canada (75), Singapore (75), Austria (74.3); while at the bottom of the rankings are: Angola (16.8), Congo (18.8), Haiti (20.3) Cape Verde (21.4), Chad (21.6), Liberia (22), Eswatini (22.7), Yemen (22.8), Lesotho (23.7), Burkina Faso (24.9), Zimbabwe (25.5), Mauritania (25.5), Ethiopia (26.5), Benin (26.7), Kyrgyz Republic (26.7). The change in relation to the previous report came for Serbia. It recorded growth in terms of innovation and is now 56th (39.7) (Schwab, 2018).

According to the latest Report GII 2018, Switzerland ranks first, followed by the Netherlands, Sweden, UK, Singapore, USA, Finland, Denmark, Germany, Ireland (WIPO, 2018a, p. 17). The economies which realize at least 10% above the average GDP of other countries are called innovators - achieve innovation (WIPO, 2018a, p. 34). In 2018, among the innovators according to this criterion, Serbia was included (WIPO, 2018a, p. 35). Serbia occupies 57th position according to the global Innovation Efficiency Ratio (which is a progress from the 67th position in 2017 and from 70th place in 2016), which is 11th place among 34 countries with upper-middle income. Serbia is in the ranking of 39 countries in Europe on the 35th place. Compared with the countries of Europe, Serbia is below the average according to the GII (WIPO, 2018b). Therefore, Serbia is a moderate innovator (European Commision, 2018).

From the point of view of innovation, it is important to point out that one country's economic policy should be based on the comparative advantages of the country. It is visible that agriculture and food industry in Serbia are very important in that context (Ančić et al., 2014, p. 306). Accordingly, a strategic commitment is needed to make agriculture one of the important economic sectors based on knowledge and innovation (Ristić, 2016), in order to transform the comparative advantages of agriculture into competitive ones. Creativity and innovation are considered new approaches in the field of rural and agribusiness development (Kvrgić & Ristić, 2018, p. 35).

Modern agriculture becomes the area of information technology use (Praća et al., 2017, p. 43). At the same time, sustainable agriculture is based on the use of technologies that maximize productivity and minimize negative effects on natural resources (land, water and biodiversity) and human resources (rural population and consumers) (Praća et al, 2017, p. 44). The key questions in the field of innovation are why and when it appears, as well as by whom it is initiated. The need for change is an essential component, as well as population growth and environmental change (Van der Veen, 2010, p. 5), which makes innovation in agriculture different from other sectors, with the fact that the production of sufficient quantity of quality of food appears as an extremely important global issue.

3. EMPIRICAL RESEARCH

3.1. Research Methodology

The Statistical program SPSS was used for processing and analysis of collected data. The collected data were analyzed in two levels.

The first level of analysis is the cluster of analyzes of selected countries for the period 2007-2017. For the selection of the innovation indicators, the GCI is used which is divided into 12 pillars, arranged in three subindices. For the innovation of the economy, the most significant are the 11th and 12th pillar (innovation and business sophistication) as the pillars of the third subindex (innovation and sophistication) that is crucial for country innovation (Schwab, 2017, p. 12) (Fig. 1).

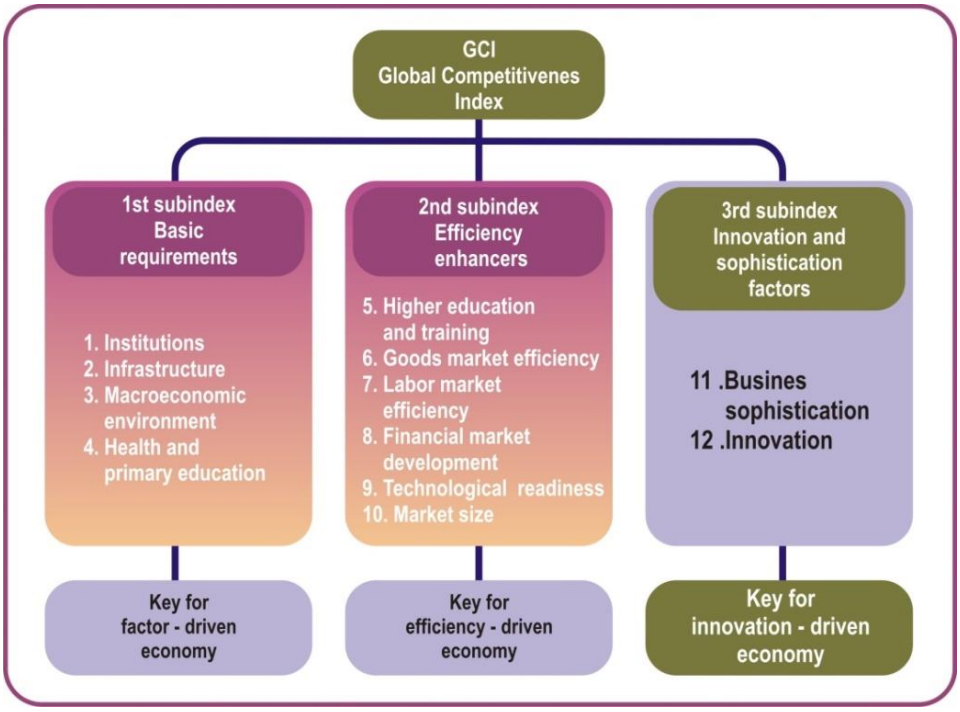

Fig. 1 GCI framework structure
Source: Schwab, 2017, p. 12.

The aim of this analysis is to indicate the differences between innovative leaders and innovative learners (Despotović et al., 2016). The innovative leaders have been selected based on the latest Report of the World Economic Forum 2018, according to the 12th pillar of the GCI (Schwab, 2018). The innovative learners are countries of Southeastern Europe. There are 10 countries in both categories. By multivariate linear regression, the influence of innovation parameters on economic development (measured by GDP per capita as a still significant indicator in economic publications) has been explored (Gligorić et al., 2018, p. 1254). Many authors, such as Savić et al. (2015) use the GII, GCI and GDPpc PPP to explore innovation as a potential for growth. Despotović et al. (2016) analyzed innovation using the 12th pillar of GCI and their impact on GDP per capita, which was also useful for this research. In this paper, comparison was made with innovative leaders and learners. The analysis also includes the HDI, which is a wider measure and a better indicator of sustainable development, as Stiglic points out (2013). Secondary data for this level of analysis were collected from: World Economic Forum, UNCTADstat and United Nations Development Programme (UNDP) (Fig. 2).

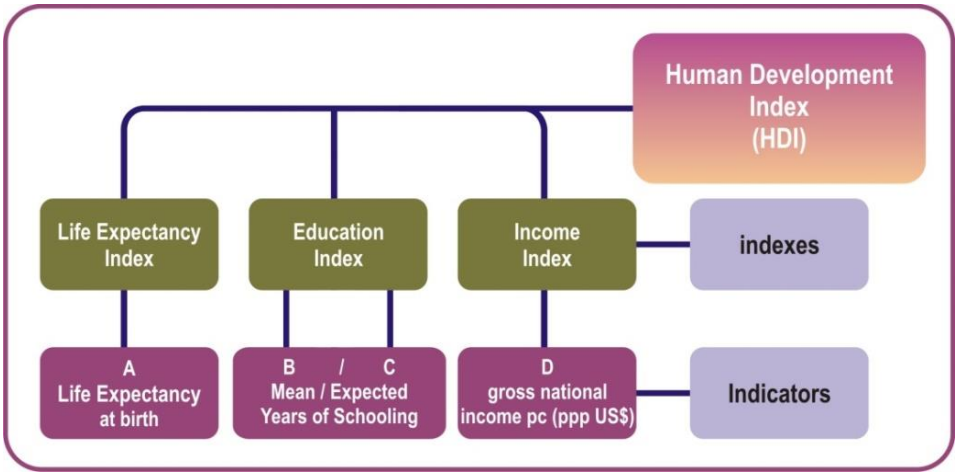

Fig. 2 HDI framework structure
Source: UNDP, 2017

The second level of analysis in this paper was used to examine statistically significant differences between the observed variables, using appropriate statistical tests. Firstly, the Gross Value Added (GVA) generated by agriculture (measured as percent of GDP) is compared with the other economic activities by using data of the Statistical Office of the Republic of Serbia (National Accounts), for the period 2007-2017. Subsequently, a comparison of productivity in the agriculture of the Republic of Serbia was made in relation to other countries of Southeast Europe and the innovative leaders. The GVA of agriculture per worker was used as a measure of agricultural productivity because information technology (IT) has a direct impact on productivity in agriculture, as pointed out by Jurjević et al. (2019). This further leads to the ultimate goal, which is an increase in the profits of agricultural producers and the sustainable development of the agrarian sector.

Serbian agriculture significantly lags behind the developed European countries (Jurjević et al., 2019, p. 45), so it is very important to pay attention to the innovations of Serbian agriculture. Analysis of technological development, production and use of new technologies, efficiency of R&D systems and realization of scientific-technological policies have traditionally focused on input indicators (R&D costs, human resources, etc.) and outcome indicators - results (patents, etc.), whose measureability is standardized and widely used, over the last decades (OECD, 2005). Despite constraints, input and output indicators (because of statistical monitoring) continue to be a significant source of information about the content and trends of technological development. The measuring of general innovation of a particular economy is limited by using only quantitative data (Kutlača&Semenčenko, 2015). Bearing all this in mind, in this paper gross domestic expenditures for R&D in the field of science were used as an indicator of input. For the output indicator, the inventions and patents used for the first time in practice (according to the scientific field), were used, in order to pay special attention on agricultural science. In addition, gross domestic expenditures (for R&D by activity) were observed. Secondary data for this level of analysis were collected from Statistical Office of the Republic of Serbia - Science, Technology and Innovation - Research and Development.

3.2. Research Results

3.2.1. Cluster and Regression Analysis

Cluster analysis[1] in this paper is based on the parameters of innovation for the 20 selected countries in the period 2007-2017. In the process of grouping the hierarchical clustering method, the countries were grouped according to similarities, based on the selected parameters. The Dendogram showed that the first two clusters included 10 countries that were singled out as innovative leaders (UK, Netherlands, Germany, Taiwan, Korea, USA, Finland, Switzerland, Japan, Sweden), and in the other two were countries of Southeast Europe - SEE (Slovenia, Croatia, Greece, Romania, Bulgaria, Montenegro, Albania, Bosnia and Herzegovina, Serbia, North Macedonia). Slovenia is the only one of the SEE countries that has been completely isolated within a single cluster, which means it is the leader in innovation in SEE. Nevertheless, the differences between countries in each of the four clusters are not large. Observed by the level of separation between clusters of less than five, there is a connection between the first two clusters and the other two clusters. At the level of the difference of more than five, first two clusters of innovative leaders are merged into one and the other two clusters of countries of Southeast Europe also in one. Therefore, we get two clusters, innovative leaders and innovative learners. There is a big difference between them. That is why in the further analysis they are separately examined i.e. the impact of innovation on their economic development using multiple regression.

The assumption about the size of the sample (N>50+8*m) was fulfilled (Palant, 2009), where m is the number of independent variables (110>50+8*2).

Table 1 Importance of Innovation for Economic Development

	Observed Countries of Southeast Europe			Observed Innovative Leaders Countries		
	B	T	Sig (p)	B	t	Sig (p)
Innovation (12th GCI)	-21.119	-.010	.992	11004.339	2.542	.012**
Business Sophistication (11th GCI)	17479.17	7.238	.000*	28089.287	5.694	.000*

Note: The value is significant at 1% (*), 5% (*), and 10% (***) confidence level
Source: Authors' research

In both cases (Table 1) is the appropriate model (p=.000). In addition, the assumption of multicollinearity is satisfied, so the model is suitable for application. In the case of Southeast Europe, there is no impact of innovation on economic development, but only business sophistication as one part of the subindex of innovation and sophistication. In the case of innovative leaders, innovation and business sophistication have an impact on economic development, which suggests that innovation has a major impact on economic development. It means that more innovative countries are economically developed. On the other hand, the countries of Southeast Europe need to increase their innovation to reach higher levels of economic development. On this basis, the first hypothesis is proven.

[1] This research results are not tabulated for reasons of space.

Table 2 Importance of Innovation for Sustainable Development

	Observed Countries of Southeast Europe			Observed Innovative Leaders Countries		
	B	t	Sig (p)	B	t	Sig (p)
Innovation (12th GCI)	.051	3.864	.000*	.012	2.260	.026**
Business Sophistication (11th GCI)	.072	5.033	.000*	.015	2.220	.029**

Note: The value is significant at 1% (*), 5% (*), and 10% (***) confidence level
Source: Authors' research

In both cases (Table 2) is the appropriate model (p=.000). In addition, the assumption of multicollinearity is satisfied. Innovation has a full impact on sustainable development, both in the case of the countries of Southeast Europe, as well as in the countries of innovative leaders (here Taiwan is omitted from the sample, because of the undisclosed HDI data from China). This means that the importance of innovation is even greater for sustainable development, where sustainable development is a broader concept than economic development (Stiglic, 2013, p. 316).

Innovation and business sophistication can be combined into one factor, and by simple linear regression their impact on economic and sustainable development can be examined.

Table 3 Factor of Innovation and Sophistication (3rd subindex of GCI)

	Economic Growth (GDP per capita)			Sustainable Development (HDI)		
	B	T	Sig (p)	B	T	Sig (p)
Observed Countries of Southeast Europe	16613.160	10.635	.000*	.122	13.896	.000*
Observed Innovative Leaders Countries	37703.582	9.017	.000*	.027	4.935	.000*

Note: The value is significant at 1% (*), 5% (*), and 10% (***) confidence level
Source: Authors' research

In both cases in the Table 3 is the appropriate model (p=.000). The factor of innovation and sophistication has an impact on the economic and sustainable development of the observed countries.

3.2.2. Statistical Tests

For the second level of analysis, Kolmogorov-Smirnov and Shapiro-Wilk tests for the distribution normality found that no indicators have a normal distribution, so nonparametric techniques are needed.

Kruskal-Wallis test was used to determine the contribution of agriculture to the economic development of the Republic of Serbia in relation to other economic activities, as well as the state of Serbian agriculture in relation to the countries of Southeast Europe and the economically developed countries.

Table 4 Importance of Agriculture for Economic Development and Agricultural Productivity

GVA		Agriculture Value Added per worker	
Chi-Square	222.042		201.099
Asymp. Sig. (p)	p=.000*		p=.000*
Economic Activities	Mean rank	Country	Mean rank
Agriculture	194.45	Serbia	32.45
Mining	62.86	Montenegro	125.55
Manufacturing Industry	226.00	North Macedonia	50.91
Electricity, Gas and Steam Supply	111.68	Albania	15.82
Water Supply	50.86	B&H	32.91
Construction	155.14	Croatia	75.64
Trade	210.95	Bulgaria	66.09
Traffic	164.27	Romania	9.36
Accommodation Services and Meals	43.00	Slovenia	77.36
Information and Communication	158.23	Greece	100.18
Financial Activities	99.59	Germany	147.09
Real Estate Business	206.59	USA	196.80
Professional, Scientific, Innovation and Technical Activities	124.23	Switzerland	130.27
Administrative and Support Service Activities	78.82	Sweden	188.82
State Administration	123.14	Japan	123.30
Education	131.09	UK	160.36
Health and Social Protection	174.64	Korea	95.55
Art, Entertainment and Recreation	40.05	Netherlands	185.00
Other Service Activities	57.41	Finland	172.73
Activity of the Household as an employer	17.00		
The Activity of Extraterritorial Organizations and Bodies	6.00		

Note: The value is significant at 1% (*), 5% (*), and 10% (***) confidence level
(The analysis excluded Taiwan because of the lack of separate data from China)
Source: Authors' research

In the observed period 2007-2017, it is visible that agriculture has a significant impact on the economic development in the Republic of Serbia (Table 4). From the economic activities classified in the 21 group, agriculture is on the 4th place, behind the manufacturing industry, trade and real estate business. On the other hand, productivity in the agriculture of the Republic of Serbia not only lags behind the more developed countries, but also behind many countries of Southeast Europe. Behind Serbia are only Albania and Romania. Because of the fact that agriculture contributes significantly to the economic development of Serbia, productivity should be increased primarily in agriculture by introducing new technologies and innovations, because they have direct impact on productivity in agriculture (Jurjević et al., 2019). This proves the second hypothesis of this paper.

Simple linear regression has determined that gross domestic expenditure on R&D has an impact on inventions and patents that were firstly used in practice (Table 5), according to the scientific field (p = .000), which means that more should be invested in agricultural science. Kruskal-Wallis test was used to determine the ratio of investments in agricultural science in relation to other sciences in the Republic of Serbia, in terms of an indicator distribution that is not normal.

In the observed period (2007-2017) investing in R&D in Agricultural Sciences (Table 5) was behind the Natural, Engineering and Social Sciences, and in front of Medical and Humanistic Sciences. Agricultural Sciences according to inventions and patents have

surpassed Social Sciences, from which it is concluded that Agricultural Science has achieved better results than the level investment for R&D.

Table 5 Research and Development Vs Inventions and Patents (according to the Scientific Fields in the Republic of Serbia)

	Research & Development	Inventions and Patents
Chi-Square	46.520	36.012
Asymp. Sig. (p)	.000*	.000*
Scientific Fields	Mean rank	Mean rank
Natural Sciences	51.64	37.59
Engineering Technology	53.95	58.50
Medical Sciences and Health Sciences	18.91	31.09
Agricultural Science	20.68	35.64
Social Science	37.73	24.18
Humanities	13.30	14.00

Note: The value is significant at 1% (*), 5% (*), and 10% (***) confidence level
Source: Authors' research

The Kruskal-Wallis test found that the gross domestic R&D expenditures by activities, ranging from 71 business activities, places agriculture on the 34th place (p = .000)[2]. This is also insufficient because agriculture is of great importance for the economic development of the Republic of Serbia. Namely, more resources should be invested for R&D in agriculture, as well as in Agricultural Science, especially for the launch of innovations.

The analysis of business subjects according to innovations and business sectors is also very important for the Republic of Serbia.

Table 6 Business subjects towards innovation and sectors of activity in the Republic of Serbia

Business subjects	
Chi-Square	28.427
Asymp. Sig. (p)	.019**
Business Sectors	Mean rank
Agriculture, Forestry and Fisheries	24.25
Mining	18.63
Manufacturing Industry	49.38
Supply of Electricity, Gas and Steam	48.88
Water Supply and Wastewater Management	19.75
Construction	25.88
Wholesale and Retail Trade and Repair of Motor Vehicles	32.63
Traffic and Storage	21.25
Accommodation Services and Meals	30.50
Information and Communication	48.38
Financial Activities and Insurance	42.50
Real Estate Business	10.25
Professional, Scientific, Innovation and Technical Activities	43.88
Administrative and Support Service Activities	38.88
Health and Social Protection	22.17
Art, Entertainment and Recreation	22.17

Note: The value is significant at 1% (*), 5% (*), and 10% (***) confidence level
Source: Authors' research

[2] This research results are not tabulated for reasons of space.

Businesses subjects according to innovation in agriculture are on the 10th place in comparation with the other sectors (total 16), and it is again insufficient because agriculture is at the top in terms of contribution to economic development.

4. CONCLUSION

In addition to the impact on economic development, innovation has an even more pronounced impact on sustainable development. The influence of innovation on economic development in the innovator countries is visible, and it makes them economically developed countries, unlike the countries of Southeast Europe. This proves the first hypothesis that more innovative countries are the economically developed ones.

Given that the influence of innovation on the economic development in the countries of Southeast Europe is missing, where only Slovenia is distinguished as an innovative leader, the economic lagging of these countries behind more innovative and at the same time economically developed countries is visible. It is necessary to approach this problem carefully, to stop in the long term even greater lag and negative reflection on sustainable development.

For the future research, it is important to analyze how to increase the innovation of Southeast Europe, and analyze all elements of the 12th Pillar of GCI as well as GII, and their impact on economic and the sustainable development of different countries. The analysis should include the relationship between R&D costs, the inventions and patents of the chosen countries, as well as their comparison with economically developed countries.

Agriculture in the Republic of Serbia has many natural resources and significant contributon to GDP, employment and exports. Namely, agriculture is one of the key economic activities for the Serbian economy, but it is lagging behind in terms of productivity. In addition, there is insufficient investment in agriculture and R&D in agricultural sciences. Thereby, agricultural businesses lag far behind other sectors of the economy in terms of innovation. Considering that many authors emphasize the great importance of introducing modern technologies for increasing productivity in agriculture, it could be concluded that insufficient innovation is one of the important causes of the lagging of agricultural productivity in the Republic of Serbia, not only behind more developed countries, but also behind many countries in the region. Therefore, it is important to introduce innovations in agricultural production process. It could have a very positive impact on productivity growth and sustainable development of the agri-food sector, which is of great importance for economic development of the Republic of Serbia. Accordingly, innovations are very important factors for the future development of agriculture in the Republic of Serbia. This conclusion proves the second hypothesis of this paper and it requires higher investments in agricultural R&D, as well as other accompanying efforts at macro and micro levels.

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ZNAČAJ INOVATIVNOSTI ZA ODRŽIVI RAZVOJ PRIVREDE I POLJOPRIVREDE U REPUBLICI SRBIJI

S obzirom da nije dovoljno samo ostvariti ekonomski razvoj, već održivi razvoj u dužem vremenskom periodu, neophodno je težiti inovativnosti, koja je izuzetno važan faktor ekonomskog rasta i održivog razvoja. Pritom je posebno važno inovirati one privredne delatnosti koje su ključne za privredni razvoj i gde postoje komparativne prednosti. U skladu sa navedenim, cilj ovog rada jeste dokazati da su inovacije ključ uspeha i ostvarivanja održivog razvoja. Klaster analizom su izdvojeni tzv. inovativni lideri i učenici. Republika Srbija je prikazana kao zemlja gde je poljoprivreda jedna od značajnih privrednih delatnosti. I pored toga, po produktivnosti u poljoprivredi ne samo da zaostaje za inovativnim liderima, već i za drugim zemljama Jugoistične Evrope koje su se izdvojile kao inovativni učenici. Takođe, po inovativnosti u poljoprivredi značajno zaostaje i za drugim privrednim delatnostima na nacionalnom nivou, zbog čega bi posebnu pažnju trebalo posvetiti ovom pitanju.

Ključne reči: *inovativnost, produktivnost, održivi razvoj, privredni razvoj, poljoprivreda*.

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Original Scientific Paper

POVERTY AS A HETEROGENEITY FACTOR IN EU COUNTRIES

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Vesna Janković-Milić, Vinko Lepojević, Jelena J. Stanković

University of Niš, Faculty of Economics, Niš, Serbia

Abstract. *Measuring poverty is of utmost importance for any economy in order to look at the extent and causes of the vulnerability of the population, but also to formulate social and economic policy measures and measure their effects. The multidimensionality of poverty makes it difficult to quantify and measure it. The subject of research is the components of the AROPE (At risk of poverty and social exclusion) indicator in the countries of the European Union (EU). Using the cluster analysis, the EU countries were grouped into homogeneous units, after which the significance of the difference in the average values of the analyzed indicators was tested. Based on the obtained results, the hypothesis of pronounced heterogeneity of EU countries from the aspect of poverty was confirmed.*

Key words: *European Union, poverty, material deprivation, heterogeneity, cluster analysis.*

JEL Classification: I32, C38, C12

1. INTRODUCTION

Poverty is one of the critical problems in the modern world. Although the number of the poor has more than halved since 1990, the United Nations maintain that one fifth of people in developing countries remain poor. That is why, and the fact that poverty threatens achievement in all other areas, ending poverty is a primary goal of the entire agenda. The goals under this objective are to eradicate extreme poverty, reduce to less than half of any form of poverty defined according to national criteria, and strengthen social and financial support for the poor.

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Corresponding author: Vesna Janković-Milić
University of Niš, Faculty of Economics, Trg kralja Aleksandra Ujedinitelja 11, 18000 Niš, Serbia
E-mail: vesna.jankovic@eknfak.ni.ac.rs

UN member states' development policies will be guided by the 2030 Sustainable Development Goals defined by the UN Development Agenda for 2030 in the coming period. Poverty reduction is highlighted as the first goal of sustainable development, which points to the great importance attached to this aspect of development.

2. POVERTY IN EUROPEAN UNION

The rise in the number of people in Europe at risk of poverty has initiated one of the major innovations introduced in Europe 2020, adopted in 2010, a new common goal in the fight against poverty and social exclusion. The goal includes reducing the number of people living below the national poverty line by 25% and save more than 20 million people out of poverty (https://ec.europa.eu/social). To achieve this, the Commission launched the European Platform against Poverty and Social Exclusion in 2010 and presented a list of key initiatives such as the evaluation of active inclusion strategies at national level and the *White Paper on pensions* (COM:2012:0055:FIN:EN:PDF).

Until 2010, the main focus in measuring poverty at EU level was on relative poverty. Comparing relative poverty rates between countries does not sufficiently take into account differences in living standards (Blanchet et al, 2019). In reality, it is more a measure of inequality. For example, a person who is relatively poor in a rich country usually suffers less material deprivation than a person living in a country where the general standard of living is low. In these countries, poverty may be more extreme, people are more likely to lack the necessary things to live, so survival is more difficult, but the relative poverty rate is lower because the overall standard of living is low, i.e. the difference between the 'poor' and everyone else standard of living is smaller. This can lead to misunderstanding of the extent of poverty and even underestimation of the severity of poverty that some social groups are facing, especially in the new EU Member States. The most difficult situation is in those EU countries where the general standard of living is low and at the same time a high relative poverty rate. In order to take into account the different economic situations of different Member States, the values of the at-risk-of-poverty line should always be considered in parallel with the indicators of at-risk-of-poverty (Boarinni et al, 2006). In the European Union, relative poverty is measured using the line of relative income poverty. This indicator involves calculating the average or median national income.

Typically, poverty lines range between 40% and 70% of household income (Milosavljević, 2008). This generates a general at-risk-of-poverty rate, and these values can be further broken down by age, gender, household type and employment status to further clarify which social groups are at highest risk. In this way it is possible to explore the individual situations of specific groups such as children, the elderly, or the unemployed. Persons below 60% of the median income in the EU are considered to be at risk of poverty (Blanchet et al, 2019).

One of the drawbacks of the relative income poverty line is that determining a tipping point is a fairly arbitrary process. It tells us about the proportion of people who are poor, but does not sufficiently take into account other factors that affect their life situations, such as information about how far below the line they are or the duration of their poverty.

Measuring the at-risk-of-poverty gap can help determine the situation of people below the poverty line, or the extent of poverty. The poverty risk gap measures the distance between the median equivalent income of persons below the at-risk-of-poverty threshold and the value of the at-risk-of-poverty threshold in terms of purchasing power.

AROPE - *At risk of poverty or social exclusion* is an indicator that reflects the multidimensionality of poverty and exclusion within the enlarged EU (Martić, 2015). This indicator is defined as the proportion of the population in at least one of the following situations (European Comission):

- exposure to the risk of poverty (households whose incomes are below the poverty line, i.e. below 60% of the median average national income);
- severe material deprivation;
- in households with low work intensity.

The composite AROPE indicator only covers part of the picture and does not describe the complexity of poverty. It is important to look at its three components separately.

Severe material deprivation implies that a household cannot afford at least 4 of the following options (Eurostat, 2009):

- to bear the unexpected, sudden financial costs;
- one week of annual leave outside the place of residence;
- one meat meal (red / chicken or fish) or vegetarian equivalent every other day;
- adequate home heating;
- durable goods, such as washing machine, colour TV, telephone, car;
- rent, loan instalments, overhead, which cannot be paid.

Very low working-intensity households are characterized by households in which the working-age persons have worked less than 20% of their total potential over the previous 12 months. Household intensity is the ratio of the total number of months that all household members of working age spent working during the reference year and the total number of months that the same household members could theoretically spend in the same period. A working age person is a person between the ages of 18 and 59, with the exclusion of students in the age group between 18 and 24 years (Eurostat, 2009).

In addition to those listed, it is important to measure other elements that capture the multidimensional nature of poverty. They include elements such as levels of debt, the extent of ill-health or disadvantage, the number of people living in inappropriate housing or poor environments, and the extent of inability to access public services.

3. DATASET AND METHODOLOGY

The subject of analysis in this paper is components of AROPE indicator in EU countries and Serbia. The basis for the analysis is EUROSTAT data for 2018. A key hypothesis in the research is that EU countries are very heterogeneous in terms of poverty. In order to confirm this hypothesis, the EU Member States were firstly grouped into homogeneous groups by cluster analysis, and then the significance of the difference in the average values of the components of the AROPE indicators between the formed groups of countries was tested. In addition, for each of the components, the position of the Republic of Serbia in relation to the EU level was analysed.

The *At-risk-of-poverty* rate is the primary component of the umbrella AROPE indicator. It is expressed as a percentage of persons at risk of poverty in the total population and by

appropriate categories of sex and age at risk of poverty. The emphasis is placed on the number of persons at risk of poverty after social transfers, wherein the threshold is 60% of the median.

In the EU member states, the *At-risk-of-poverty rate* would be significantly higher than it would be if there were no social transfers. In the most generous and efficient systems, the relative income poverty rate decreases by 50% (in Denmark, Ireland, Luxembourg, Austria, Finland and Sweden) or more, while in the least efficient it decreases by only 20% or less (in Bulgaria, Greece and Italy). Poverty risk exposure indicators for the EU and Serbia in 2018 are shown in the following table:

Table 1 *At-risk-of-poverty rate* in EU countries and Serbia

Country	At risk of poverty rate	Rank within EU	Deviation from EU average
European Union	16.9	-	-
Belgium	16.4	14.5	-0.5
Bulgaria	22.0	4.0	5.1
Czechia	9.6	28.0	-7.3
Denmark	12.7	25.0	-4.2
Germany	16.1	16.0	-0.8
Estonia	21.9	5.0	5.0
Ireland	15.6	18.0	-1.3
Greece	18.5	10.0	1.6
Spain	21.5	6.0	4.6
France	13.3	22.5	-3.6
Croatia	19.4	8.0	2.5
Italy	20.3	7.0	3.4
Cyprus	15.7	17.0	-1.2
Latvia	23.3	2.0	6.4
Lithuania	22.9	3.0	6.0
Luxembourg	18.7	9.0	1.8
Hungary	12.8	24.0	-4.1
Malta	16.8	13.0	-0.1
Netherlands	13.4	21.0	-3.5
Austria	14.3	20.0	-2.6
Poland	14.8	19.0	-2.1
Portugal	17.3	11.0	0.4
Romania	23.5	1.0	6.6
Slovenia	13.3	22.5	-3.6
Slovakia	12.4	26.0	-4.5
Finland	12.0	27.0	-4.9
Sweden	16.4	14.5	-0.5
United Kingdom	17.0	12.0	0.1
Serbia	25.7	-	8.8

Source: http://ec.europa.eu/eurostat/data/database

According to the values of the indicator *At-risk-of-poverty rate*, presented in the Table 1, Romania has the highest rate within the EU (23.3), while the lowest is in the Czech Republic (9.6). In Serbia, the *At-risk-of-poverty rate* amounts to 25.7, which is higher compared to all EU countries. At EU level, the *At-risk-of-poverty rate* amounts to 16.9. Compared to this value, 16 member states have a poverty risk rate below this value, while in the remaining 12 countries, the *At-risk-of-poverty* rate is higher. A graphical representation of deviations from the EU level is shown on the Figure 1.

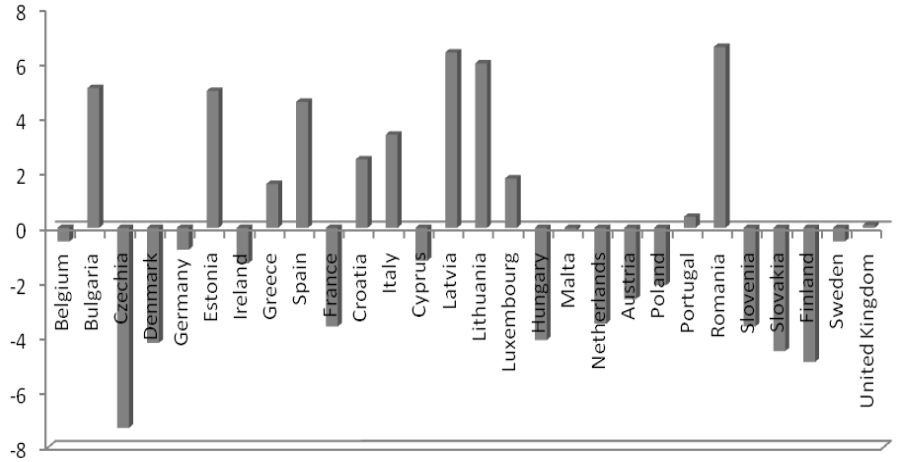

Fig. 1 At-risk-of-poverty rate - deviations from EU level
Source: Forth column from Table 1

According to the Table 1, and Figure 1 also, countries with the *At risk of poverty rate* below the EU level are: Belgium, Czech Republic, Denmark, Germany, Ireland, France, Cyprus, Hungary, Malta, the Netherlands, Austria, Poland, Slovenia, Slovakia, Finland and Sweden. Other EU Member States, including: Bulgaria, Estonia, Greece, Spain, Croatia, Italy, Latvia, Lithuania, Luxembourg, Portugal, Romania and the UK, have *At-risk-of-poverty rate* above EU level.

The use of deprivation indicators is another significant approach in measuring relative poverty. They are an attempt to move away from mere monetary, income indicators that take better account of a person's real standard of living. The approach involves identifying goods or activities that are considered essential needs in a particular country. In some countries, the measurement of poverty is based on the combination of the relative income line with indicators of deprivation. At EU level, extreme poverty is estimated using indicator *Severe material deprivation*. This indicator has limitations in terms of the small number of items it includes, as well as the lack of relevance of some of them, so its improvement is constantly being worked on.

Table 2 Indicator *Severe material deprivation* in EU countries and Serbia

Country	Severe material deprivation (% of total population)	Rank within EU	Deviation from EU level
European Union	14.5	-	-
Belgium	10.5	16.5	-4.0
Bulgaria	32.9	2.0	18.4
Czechia	7.8	23.0	-6.7
Denmark	7.2	24.0	-7.3
Germany	9.1	20.0	-5.4
Estonia	9.9	19.0	-4.6
Ireland	14.8	12.0	0.3
Greece	33.6	1.0	19.1
Spain	13.9	13.0	-0.6
France	11.1	15.0	-3.4
Croatia	23.3	5.0	8.8
Italy	16.8	9.0	2.3
Cyprus	28.6	4.0	14.1
Latvia	21.0	7.0	6.5
Lithuania	23.1	6.0	8.6
Luxembourg	4.4	28.0	-10.1
Hungary	19.6	8.0	5.1
Malta	8.7	21.0	-5.8
Netherlands	6.5	25.0	-8.0
Austria	6.3	26.0	-8.2
Poland	10.5	16.5	-4.0
Portugal	16.6	10.0	2.1
Romania	32.2	3.0	17.7
Slovenia	10.4	18.0	-4.1
Slovakia	16.4	11.0	1.9
Finland	8.0	22.0	-6.5
Sweden	4.5	27.0	-10.0
United Kingdom	12.3	14.0	-2.2
Serbia	30.7	-	16.2

Source: http://ec.europa.eu/eurostat/data/database

According to the values of the indicators, severe material deprivation, within the EU, the most difficult situation is in Greece, where participation is 33.6%, followed by Bulgaria (32.9%), while the best situation is in Luxembourg (4.4%). Analyzing the data for Serbia, it can be seen that the participation of the population in the state of severe material deprivation is lower than in Greece, Bulgaria and Romania, as it amounts to 30.7%. Graphical representation of the EU countries rankings according to the indicator *Severe material deprivation* for one person is shown in Figure 2.

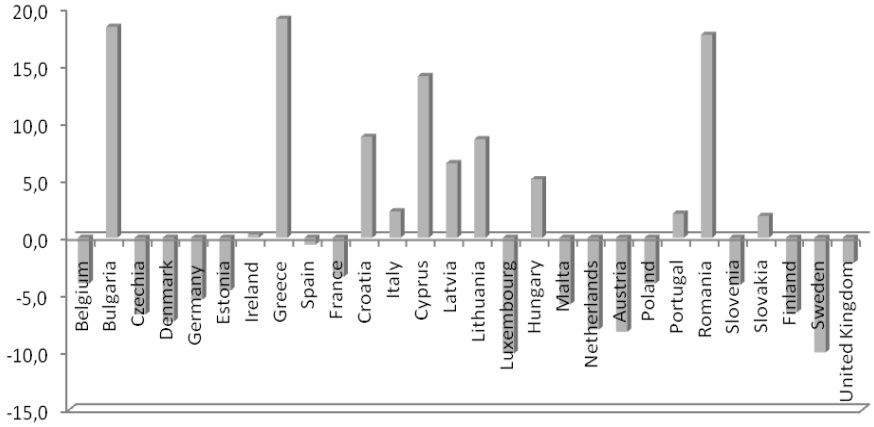

Fig. 2 Deviation from EU level according to indicator *Severe material deprivation*
Source: The fourth column from the Table 2.

As with the *At risk of poverty rate*, 16 countries are below the EU level in terms of household participation in a severe material deprivation state, while 12 countries are above this level. It is necessary to emphasize that, although the number of countries is the same, their structure differs. Countries which have the higher values of this indicator, compared to the EU level, are: Bulgaria, Ireland, Greece, Croatia, Italy Cyprus, Latvia, Lithuania, Hungary, Poland, Romania and Slovakia.

According to the EU methodology, very low working-intensity households are households in which working age persons have worked less than 20% of their total potential over the previous 12 months. In the EUROSTAT database the values of this indicator are given for different categories of households (two-member, three-member, and four-member), as well as the total, i.e. average value by country. Further research will analyze in detail the average value by country.

As can be seen, the highest percentage of people living in very low working intensity households within EU countries is in Ireland (16.2) and Greece (14.6). The lowest percentage is characteristic of the Czech Republic, where it stands at 4.5, which is almost four times less than in Ireland. It can be concluded that this component of the AROPE indicator is characterized by a very large dispersion. According to this indicator, the Republic of Serbia is in a very unenviable position in relation to all EU countries, because the share of households with very low labour intensity is slightly above 20% (20.1%).

Table 3 Percentage of the population living in very low working intensity households in EU countries and Serbia

Country	Very low working intensity households	Rank within EU	Deviation from EU average
European Union	9.5	-	-
Belgium	12.1	3.0	2.6
Bulgaria	9	12.5	-0.5
Czechia	4.5	28.0	-5
Denmark	11.1	6.0	1.6
Germany	8.7	14.5	-0.8
Estonia	5.2	27.0	-4.3
Ireland	16.2	1.0	6.7
Greece	14.6	2.0	5.1
Spain	10.7	8.0	1.2
France	8.1	16.0	-1.4
Croatia	11.2	5.0	1.7
Italy	11.3	4.0	1.8
Cyprus	9.4	10.0	-0.1
Latvia	7.6	17.0	-1.9
Lithuania	9	12.5	-0.5
Luxembourg	6.9	21.0	-2.6
Hungary	5.7	22.0	-3.8
Malta	5.5	24.0	-4
Netherlands	8.7	14.5	-0.8
Austria	7.3	19.0	-2.2
Poland	5.6	23.0	-3.9
Portugal	7.2	20.0	-2.3
Romania	7.4	18.0	-2.1
Slovenia	5.4	25.5	-4.1
Slovakia	5.4	25.5	-4.1
Finland	10.8	7.0	1.3
Sweden	9.1	11.0	-0.4
United Kingdom	10.1	9.0	0.6
Serbia	20.1	-	10.6

Source: http://ec.europa.eu/eurostat/data/database

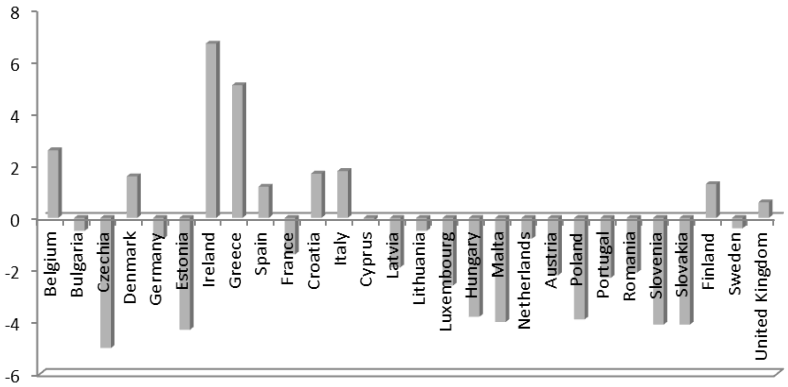

Fig. 3 People living in households with very low work intensity – deviation from EU level
Source: The fourth column from the Table 3.

Although this indicator is characterized by high dispersion, there is a small number of countries with share of households with very low working intensity higher than the EU level (9.5%). More precisely, it is only 9 countries, which can be considered as one third of total membership: Belgium, Denmark, Ireland, Greece, Spain, Croatia, Italy, Finland and the United Kingdom.

By observing deviations from the EU level it can be seen that certain EU countries are in a very bad position. Namely, the values of all three components of the AROPE indicator in Greece, Croatia and Italy are above the EU level. The reasons for this position of these countries are numerous. The longstanding crisis and austerity measures in Greece have deepened poverty. Croatia is characterized by a large heterogeneous spatial distribution of poverty. In Italy, the population living in absolute poverty is constantly increasing.

4. Results and Discussion

As part of the statistical analysis of the indicators presented, a correlation analysis was first performed, i.e. the correlation coefficients were calculated. With this measure, the direction and the degree of agreement of the indicators was assessed. As the assumptions for calculating the Pearson correlation coefficient are not fulfilled, the Spearman`s rho correlation coefficient, as a non-parametric measurement of the interdependence between indicators, has been calculated. All components of the AROPE indicator are directly correlated. According to this coefficient, the highest interdependence exists between the components *At-risk-of-poverty rate* and *Severe material deprivation* ($r = 0.491$, $p = 0.008$). Significantly lower and also insignificant correlation exists between *Severe material deprivation* and *Low working intensity households* ($r = 0.277$, $p = 0.153$), as well as between *At-risk-of-poverty rate* and *Low working intensity households* ($r = 0.189$, $p = 0.336$).

The analysis of the values of the components of the AROPE indicators indicates the great heterogeneity of EU countries. To group these into homogeneous entities, a hierarchical cluster analysis was applied (Everitt et al, 2011), with a predefined number of clusters (3). Ward's method was used as the clustering method and the Euclidean distance squared as a similarity measure. The number of countries in the clusters formed is different. There are 8 countries in the first cluster, 7 countries in the second cluster and 13 countries in the third cluster. The structure of the formed cluster is shown in the following table.

Table 4 Cluster membership

Cluster I	Cluster II	Cluster III
Belgium	Bulgaria	Czechia
Ireland	Greece	Denmark
Spain	Croatia	Germany
Italy	Cyprus	Estonia
Hungary	Latvia	France
Portugal	Lithuania	Luxemburg
Slovakia	Romania	Malta
United Kingdom		Netherlands
		Austria
		Poland
		Slovenia
		Finland
		Sweden

Source: Authors' calculation in SPSS

Based on the values of the descriptive measures (Table 5), it can be concluded that in the second cluster, average rate of exposure to poverty risk is the highest (20.75), percentage of the population in severe material deprivation is the highest (27.81), while the average percentage of households with very low labour intensity is slightly below the highest average percentage (9.74), which otherwise binds to the first cluster (9.84). The least-poor countries, according to selected indicators, are countries belonging to the third cluster. Countries which are classified in the first cluster characterize the highest percentage of households with very low working intensity, a much lower *At-risk-of-poverty rate* (16.66) and the participation of the population in severe material deprivation (15.11) compared to the countries from the second cluster. As the values of the analyzed indicators in Serbia are higher than in the EU countries, it can be assumed that Serbia would belong to second cluster.

The highest dispersion, according to the indicators *At-risk-of-poverty rate* and the participation of very low work-intensity households, characterizes the countries belonging to the first cluster. Countries belonging to the second cluster, which can be characterized as the "poorest", although there are few, show the highest dispersion according to the value of indicator *Severe material deprivation*.

Table 5 Descriptive statistics

Indicator	Cluster	Mean	Std. Deviation	95% Confidence Interval for Mean		Min.	Max.
				Lower Bound	Upper Bound		
At risk of poverty rate	1	16.66	3.19	13.99	19.33	12.4	21.5
	2	20.75	2.96	18.02	23.50	15.7	23.5
	3	14.87	3.16	12.96	16.78	9.6	21.9
	Total	16.85	3.86	15.36	18.35	9.6	23.5
Severe material deprivation	1	15.11	2.87	12.71	17.51	10.5	19.6
	2	27.81	5.30	22.92	32.71	21.0	33.6
	3	8.03	2.20	6.70	9.36	4.4	11.1
	Total	15.00	8.74	11.61	18.39	4.4	33.6
Low working intensity households	1	9.84	3.63	6.80	12.87	5.4	16.2
	2	9.74	2.48	7.45	12.04	7.4	14.6
	3	7.45	2.17	6.14	8.76	4.5	11.1
	Total	8.71	2.88	7.59	9.82	4.5	16.2

Source: Authors' calculation in SPSS

In order to determine the significance of the difference in the average values of the selected indicators, Kruskal-Wallis test has been applied. The Kruskal-Wallis test (also called the "one-way ANOVA on ranks") is a rank-based nonparametric test. It is considered the nonparametric alternative to the one-way ANOVA, and an extension of the Mann-Whitney U test to allow the comparison of more than two independent groups.

The characteristics of the clusters formed can also be observed based on the average rank values (Table 6). The lowest average rank values for all indicators refer to the third cluster, followed by the first and finally the second cluster. Since the testing was conducted at 0.05 significance level, the test results proved a statistically significant difference between the clusters according to the indicators *At-risk-of-poverty rate* ($p = 0.007$) and *Severe material deprivation* ($p < 0.0001$), while in the case of low work intensity this difference was not confirmed.

Table 6 Results of Kruskal-Wallis test

Indicator	Cluster	Mean Rank	Chi-Square	df	Sig.
At risk of poverty rate	1	14.19	10.071	2	0.007
	2	22.57			
	3	10.35			
Severe material deprivation	1	17.31	22.823	2	0.0001
	2	25.00			
	3	7.12			
Low working intensity households	1	17.44	4.911	2	0.086
	2	18.00			
	3	10.81			

Source: Authors' calculation in SPSS

5. CONCLUSION

Poverty is nowadays most commonly seen as a multidimensional concept, which is also reflected in the overarching official definitions adopted by the European Union and the United Nations. It is a problem faced by a large number of countries, regardless of their level of economic development. It can also be stated that poverty is a multidimensional phenomenon which, in addition to insufficient income to meet basic living needs, also includes aspects related to human rights, such as: inability to find employment, inadequate housing, inadequate access to social protection, health and utilities, etc. For the purpose of combating poverty and inequality in the EU, the aforementioned Europe 2020 Strategy has been defined, but numerous pilot projects and programs, various treaties and other acts have been adopted, the Directives adopted (Racial Equality 2000/43 / EC, Employment 2000/78 / EC, Equal Treatment of Women and Men 2006/54 / EC) and various incentive measures presented.

Adequate measuring is a very important factor in the process of combating poverty. For this purpose, the complex AROPE indicator, whose components are analyzed in this paper, has been created. But, this indicator covers only part of the picture and does not describe the complexity of poverty. A statistically significant difference in the average values of the selected indicators is in favour of confirming the key hypothesis in the survey, that is, EU Member States are very heterogeneous in terms of poverty. The observed and statistically confirmed differences in the poverty rate of the EU Member States suggest that it is very important to regulate this issue at the national, regional and local levels with policies, strategies and other guidelines.

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SIROMAŠTVO KAO FAKTOR HETEROGENOSTI ZEMALJA EVROPSKE UNIJE

Merenje siromaštva je od izuzetnog značaja za bilo koju ekonomiju radi sagledavanja razmera i uzroka ugroženosti stanovništva, ali i radi formulisanja mera socijalne i ekonomske politike i merenja njihovih efekata. Multidimenzionalnost siromaštva u velikoj meri otežava njegovu kvantifikaciju i merenje. Predment istraživanja u ovom radu su komponente AROPE (At risk of poverty and social exclusion) indikatora u zemljama Evropske Unije (EU). Primenom klaster analize zemlje Evropske Unije svrstane su u homogene celine, a nakon toga ispitana je značajnost razlike u prosečnim vrednostima analiziranih pokazatelja. Na osnovu dobijenih rezultata potvrđena je hipoteza o izraženoj heterogenosti zemalja EU sa aspekta siromaštva.

Ključne reči: *Evropska unija, siromaštvo, materijalna deprivacija, heterogenost, klaster analiza*.

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Original Scientific Paper

THE RELATION BETWEEN MULTINATIONAL COMPANIES AND THE REPUBLIC OF SERBIA: INCOME TAXATION CONTEXT

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Stefan Vržina, Nenad Janković

University of Kragujevac, Faculty of Economics, the Republic of Serbia

Abstract. *Host countries, especially developing countries, often grant tax incentives in order to attract foreign capital of multinational companies (MNCs), expecting positive effects of foreign direct investments on their economic development. Also, there is an opinion dominant in the literature that MNCs have enough power to achieve considerable tax incentives in negotiations with host country. Considering that one MNC was granted considerable tax incentives from the Republic of Serbia (RS), the paper examines whether subsidiaries of MNCs have more favorable tax treatment of recorded income than domestic companies in the RS. Statistical analysis outcomes show that subsidiaries of MNCs do not have significantly lower income tax burden than domestic companies suggesting that tax incentives granted to MNCs from the RS are an exception rather than a rule. In addition, research showed that subsidiaries of MNCs primarily use tax incentives that are equally available to domestic companies, such as tax incentives for investment in fixed assets. Research results are robust to changes of income tax burden measures.*

Key words: *multinational companies, domestic companies, host countries, income tax, tax incentives, the Republic of Serbia*

JEL Classification: F21, F23, H25, H26

INTRODUCTION

In order to attract foreign direct investments (FDIs), many countries offer substantial incentives. In particular, this relates to developing and less-developed countries. De Mello (1997) lists tax incentives (tax rebates and tax exemptions), financial incentives

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Corresponding author: Sefan Vržina
University of Kragujevac, Faculty of Economics, Liceja Kneževnine Srbije 3, 34000 Kragujevac, Serbia
E-mail: stefan.vrzina@kg.ac.rs

(subsidized loans and grants) and non-financial incentives (infrastructure provision) as most important types of incentives.

Although prior research in developing and less-developed countries (Beyer, 2002; Cleeve, 2008; Klemm & Van Parys, 2012) only partially finds positive impact of tax incentives on FDIs inflow, governments of these countries still offer important tax incentives to foreign investors. In this regard, Rajan (2004) points out at "fiscal war" between these countries in pursuit for FDIs.

Multinational companies (MNCs) providing important share of FDIs with their investments into developing countries rapidly grew in the last few decades (Buthe & Milner, 2008). The relation between MNCs and host countries (countries that attract FDIs) may vary from negative and confrontational to positive and cooperative. Prior research (Sanyal & Guvenli, 2000; Luo, 2001) finds that cooperative relation between MNC and host country is a significant determinant of MNC performance in host country.

Motivation for the research is found in special tax incentives granted to the largest subsidiary of MNCs in the Republic of Serbia (RS). It is worth noting that this subsidiary contributed a lot to recovery of Serbian automotive industry (Kocić et al., 2017). On the other hand, this subsidiary enjoys important tax incentives from the RS. In addition, prior research in this area is scarce since the aggregate data on tax incentives granted from the RS is not publicly available (Radenković, 2016, p. 74).

Research subject of this paper is the relation between MNCs and the RS with focus on income tax incentives granted by the RS. Income tax is chosen since foreign investors in Serbia value income tax incentives more than any other tax incentive (Domazet et al., 2018). Research objective is to examine whether MNCs are granted special income tax incentives by the RS, through comparison of income tax burden of subsidiaries of MNCs and domestic companies.

For the purposes of this paper, MNC is defined as a company incorporated in one country with subsidiaries in at least two foreign countries, while domestic company is defined as a company owned by individual residents of the RS. Income tax burden is measured by two effective income tax rates: Current and Cash effective income tax rates.

In line with defined research subject and objective, the following null and alternative research hypotheses are tested in the paper:

H_0: *MNC subsidiaries do not have lower effective income tax rates than domestic companies in the RS.*

H_1: *MNC subsidiaries have lower effective income tax rates than domestic companies in the RS.*

Research contributes to the existing, primarily foreign, research on the relation between MNCs and host countries. To authors' knowledge, this is the first research of this type in the RS. Research results can be of interest for owners and management of MNCs when deciding on investment in the RS, as well as for fiscal policymakers when assessing the fairness of income tax system of the RS.

Besides introduction and conclusion, the paper consists of three sections. The first section gives an overview on sources of power of MNCs that provide them a more powerful position compared to host countries. In the second section, the power of MNCs in the RS is analyzed, while research methodology and results are given in the third section.

1. Sources of Power of Multinational Companies

MNCs have one of the key roles in shaping modern economics. They influence the international trade and government policies worldwide, thus influencing economic development of countries (Macleod & Lewis, 2004). Rondinelli (2002) argues that directors and associations of MNCs have a substantial influence on social, economic and environmental policy of many countries.

Due to their size (as measured by total assets or revenue), MNCs are often more powerful than host countries, in particular small and less-developed countries. MNCs such as ExxonMobil, General Electric, General Motors, Ford, Toyota and Walmart record annual revenue higher than gross national product (Rondinelli, 2002) or public revenue (Global Justice Now, 2016) of most countries.[1]

Position of MNCs is often determined by relative power of MNC and host country. Tarzi (1991) lists three basic sources of power of MNCs:

- a large share of total stock of investment, production and sales in the host country;
- domination in key industries of the host country and
- monopoly or oligopoly power in highly concentrated industries (e.g. petroleum or chemicals) of the host country.

Position of MNCs is also influenced by relative bargaining power of MNC and host country. Ramamurti (2001) argues that both MNCs and host countries have many sources of bargaining power since they have many benefits to offer each other. Due to advanced technology, product differentiation and large capital, MNCs may foster competition and export of the host country. On the other hand, the power of host countries is based on granting access to home market, national resources, local labor and a variety of incentives.

Important source of MNCs power comes from support of the parent country. Boddewyn (2016) stresses that many MNCs headquartered in emerging countries are state-owned or subsidized. In addition, Alden & Davies (2006) argue that MNCs headquartered in China have a large parent country support (including tax incentives) in order to become key global market players.

The power of MNCs is larger as they contribute more to the economic development of host country. MNCs may be important source of export and export competitiveness of host country, particularly if they are engaged in production (rather than trade or financial) sector of economy (Estrin & Uvalić, 2016).

Since MNCs may strengthen macroeconomics of the (primarily developing and less-developed) host country, they can negotiate many benefits with the local government. Blomstrom et al. (2003) argue that many countries lowered barriers for FDIs inflow, expecting higher employment, export and technological development as a result. On the other hand, Jensen (2003) concludes that host country citizens often bear substantial costs of incentives granted to MNCs.

Bitzenis et al. (2009) treat taxes as important barrier for investment of MNCs into transition economies. In this regard, Vogiatzoglou (2018) finds that many Eastern European countries have lowered the tax rates to attract foreign investors. Due to their

[1] It is also possible to find opposite opinion. De Grauwe & Camerman (2003) use value added instead of total assets or revenue to measure MNCs size and compare it to the GDP (a macroeconomic value added measure). Measuring the value added as a sum of pre-tax income, labor and depreciation costs, they conclude that MNCs are indeed much smaller (i.e. less powerful) than previously argued.

power, MNCs can negotiate additional tax incentives, thus having a lower tax burden than other companies.

Countries with preferential tax system (tax havens) increase the power of MNCs (Ruggie, 2018). MNCs often invest in host countries through countries with preferential tax system in order to shift income recorded in host country to other countries (parent country or tax haven) with minimal tax paid.

On the other hand, MNCs may abuse dominant position in host country. MNCs often arrange aggressive transfer pricing system (related-party transactions valuation system) to minimize income tax expense. Most of the countries are not powerful enough to sanction such MNCs behavior – some of the rare examples are penalties paid by GlaxoSmithKline (Gujarathi, 2007) and Apple (Barrera & Bustamante, 2018) following the decisions of United States tax authorities and European Commission, respectively.

Siegfried (1972) developed a theory (known as political power hypothesis) of negative relation between company size and effective tax burden. The theory suggests that larger and more powerful companies are able to lobby national tax authorities to reduce tax expense. Larger companies also have more resources to invest in tax advising to avoid taxes. Abundant empirical research (Guha, 2007; Richardson & Lanis, 2007; Hsieh, 2012) confirmed political power hypothesis, at least partially.

2. POWER OF MULTINATIONAL COMPANIES IN THE REPUBLIC OF SERBIA

As a leading FDI provider, MNCs considerably influence economy of the RS. Kastratović (2016) argues that FDIs may positively influence economic growth and development of the RS, while Popov (2010) points out at necessity of FDIs to achieve economic stability of the RS.

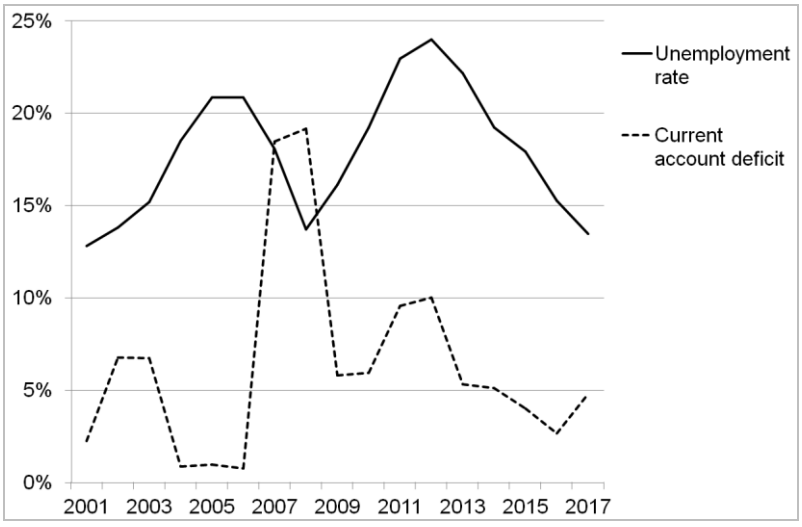

Fig. 1 Unemployment rate and current account deficit as a percent of GDP in the RS between 2001 and 2017
Source: *Authors; based on World Bank (data.worldbank.org/country/serbia) and UNCTAD (unctadstat.unctad.org) data.*

MNCs also have an important share in employment of the RS since significant portion of labor is employed in Serbian subsidiaries of MNCs. Boljanović & Hadžić (2017) emphasize the importance of FDIs for export, export competitiveness and productivity of the RS, while Đorđević (2015) argues that MNCs may be a solution for unemployment and balance-of-payments deficit problems.

However, the impact of FDIs on key macroeconomic indicators of the RS is still unclear, partially due to the global economic crisis. Figure 1 presents unemployment and current account deficit of the RS between 2001 and 2017, showing that these indicators have not changed considerably.

Year 2001 is chosen as a starting year since the foreign capital inflows in the RS intensified after 2000 when Serbia opened the economy to the world. Unemployment rate has been reduced in 2007 and 2008, partially as a result of high FDI inflows in 2006. In addition, unemployment rate continuously declines since 2012. Đorđević (2015) argues that FDIs did not significantly impact unemployment since they are dominantly realized as privatizations, not greenfield investments. On the other hand, current account deficit in balance-of-payments has been considerably increased in 2007 and 2008, primarily as a result of global economic crisis. It is also worth noting that the RS has surplus in services trade and high deficit in merchandise trade.

Observing period between 2008 and 2017, Business Info Group (2018) finds 13 subsidiaries of MNCs among the 15 largest exporters in the RS. Jeremić et al. (2015) find high concentration of Serbian export, dominated by a small number of foreign companies. On the other hand, among the 12 largest net exporters in the RS there are only seven MNC subsidiaries, indicating significant import activities of subsidiaries of MNCs in the RS. Therefore, it is necessary to be careful when assessing impact of MNCs on reduction of balance-of-payments deficit.

Ilić et al. (2018) find that MNCs have privatized many Serbian companies and increased their competitiveness, efficiency and profitability. MNCs had important role in privatization of both real and financial sector companies (Kekić, 2005) and also had important share in greenfield investments (Domanović & Stojadinović Jovanović, 2017).

Global Justice Now (2016) analyzed revenues of MNCs and countries and listed 199 companies with annual revenue higher than public revenue of the RS. In this regard, these companies might be considered as more powerful than the RS. However, it should be noted that many of these companies do not have a subsidiary in the RS.

In general, MNCs income in the RS has the same tax treatment as income of other companies. Statutory income tax rate in the RS is 15% and it can be considered as relatively low. Gravelle (2009) argues that MNCs management often treats countries with statutory income tax rate lower than 20% as countries with preferential tax system (though assessment of income tax burden should not include only statutory income tax rate, but also the rules for taxable income calculation, tax exemptions, incentives and credits). MNCs can also benefit from the investment in the RS through many double tax treaties that the RS signed with other countries.

An impact of MNCs on the RS can be perceived through example of the largest MNC subsidiary in the RS, operating in automotive industry. Two thirds of the subsidiary's capital is owned by MNC, while one third belongs to the RS. According to the Business Info Group (2018), it is the largest exporter and net exporter in the RS, thus considerably shaping the RS economy. Founded in 2008, the subsidiary negotiated important tax incentives from the RS, disclosed in their annual financial reports:

A company has a right on different incentives and tax exemptions. Some of them include: refund of social contributions paid for each employee, ten-year income tax exemption starting from the first year in which taxable income is recorded, exemption of local taxes (property tax, urban plan implementation tax, trademark presentation tax etc.)

Regarding income tax, this subsidiary makes significant tax savings. Table 1 presents income statement part related to income tax of this subsidiary, based on the Business Registers Agency of the RS (www.apr.gov.rs) data.

Table 1 Income statement part related to income tax of the studied subsidiary between 2010 and 2017

Position	Amount (in 000 Serbian dinars)			
	2010	2011	2012	2013
Pre-tax income	548,137	-5,698,875	-1,863,164	1,166,176
Current income tax expense	0	0	0	0
Deferred income tax expense (revenue)	(7,428)	(14,451)	(1,640,802)	34,875
Net income	555,565	-5,684,424	-222,362	1,131,301
Position	Amount (in 000 Serbian dinars)			
	2014	2015	2016	2017
Pre-tax income	2,346,403	2,352,261	2,105,405	2,295,657
Current income tax expense	0	0	0	0
Deferred income tax expense (revenue)	(118,955)	(31,379)	(17,297)	164,379
Net income	2,465,358	2,383,640	2,122,702	2,131,278

Source: Authors; based on the Business Registers Agency of the RS (www.apr.gov.rs) data.

Despite substantial tax incentives granted to studied subsidiary, it should be noted that the RS was not the only Balkan investment option for this MNC (Trifunović et al., 2009). As a result, Estrin & Uvalić (2016) argue that such incentives were necessary to motivate this investor to invest in the RS, indicating that the investment without incentives was not the most profitable option for foreign investor.

3. EMPIRICAL RESEARCH

3.1. Research methodology and sample development

Empirical research is conducted on the basis of financial data of 100 companies: 50 subsidiaries of MNCs and 50 domestic companies. Research captured the period between 2014 and 2017. In order to test sensitivity of the research results, two income tax burden measures are used – Current effective income tax rate (ETR1) and Cash effective income tax rate (ETR2).

According to Global Justice Now (2016) data, there are 20 sampled subsidiaries of MNCs whose annual revenue is higher than public revenue of the RS. Additional 11 subsidiaries are sampled from the Business Info Group (2018) lists: a hundred companies with the highest operating revenue and a hundred companies with the highest net income in the RS between 2008 and 2017. The remaining 19 companies are randomly selected. On the other hand, a sample comprises 31 domestic companies appearing in two mentioned Business Info Group (2018) lists. The remaining 19 companies are randomly selected. In

order to ensure reliability of the data, only companies with audited statutory financial reports for 2017 are sampled.

As of 1st January 2019, 14 sampled subsidiaries are directly owned by Dutch entities of MNCs. Since the Netherlands are considered as the largest conduit country in profit shifting to tax havens (Weyzig, 2013), the research supports Ruggie (2018) arguing that MNCs tend to organize their foreign investments through entities in such countries.

Sampling 100 companies across four-year period, an initial sample comprises 400 observations. However, there are 34 observations withdrawn due to pre-tax loss in order to avoid negative effective income tax rates. Therefore, final sample comprises 366 observations.

Financial data used in the research have been retrieved from statutory financial reports published on the website of the Business Registers Agency of the RS (www.apr.gov.rs). Statistical data processing has been conducted in SPSS (Statistical Package for Social Sciences) and EViews.

Regarding statistical methods, tests of equality of independent groups are conducted in the paper. In order to control the impact of other company-specific variables, multiple regression analysis is also conducted. Through regression analysis, the impact of ownership type (MNC ownership or domestic ownership, OWN) on effective income tax rates (ETR1 and ETR2) is examined. In line with prior research (Guha, 2007; Richardson & Lanis, 2007; Hsieh, 2012), the following control variables are used in the paper: size (SIZE), leverage (LEV), profitability (PROF) and capital intensity (CAPIT) of companies. Definitions of employed variables are given in Table 2.

Table 2 Variables definition

Variable label	Formula
ETR1	(Current income tax expense / Pre-tax income) x 100
ETR2	(Income tax paid / Pre-tax income) x 100
OWN	0 if MNC ownership; 1 if domestic ownership
SIZE	Natural logarithm of total assets (in 000 Serbian dinars)
LEV	Total liabilities / Total assets
PROF	(Pre-tax income / Total assets) x 100
CAPIT	Fixed assets / Total assets

In line with defined variables, it is possible to formulate the following regression model:

$$ETR_{i,t} = \alpha + \beta_1 OWN_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 PROF_{i,t} + \beta_5 CAPIT_{i,t} + \varepsilon_{i,t} \quad (1)$$

where ETR refers to ETR1 and ETR2.

3.2. Research results

3.2.1. Descriptive statistics

Table 3 shows descriptive statistics. On the average, effective income tax rates are lower than statutory income tax rate of 15%, though with some three-digit extreme values. LEV is in eight observations (each refers to subsidiaries of MNCs) higher than one, indicating losses above owners' capital. It is interesting to note that two observations with highest PROF regard the same company engaged in betting industry.

Table 3 Descriptive statistics

Variable	Mean	Minimum	Median	Maximum	Standard deviation
Panel A. Descriptive statistics at the whole sample level					
ETR1	12.183%	0.000%	11.786%	113.076%	12.278%
ETR2	14.874%	0.000%	9.628%	405.458%	29.623%
OWN	Value 0 – 171 observations; Value 1 – 195 observations				
SIZE	15.152	12.022	15.094	19.807	1.245
LEV	0.521	0.053	0.526	4.353	0.338
PROF	10.254%	0.024%	8.080%	83.330%	10.185%
CAPIT	0.394	0.004	0.399	0.823	0.227
Panel B. ETR1 by the ownership type					
MNC subsidiaries	12.970%	0.000%	11.628%	113.076%	15.656%
Domestic companies	11.493%	0.000%	11.839%	68.426%	8.235%
Panel C. ETR2 by the ownership type					
MNC subsidiaries	16.677%	0.000%	4.694%	405.458%	40.488%
Domestic companies	13.292%	0.000%	11.567%	103.647%	14.462%

Regarding ETR1 and ETR2, mean and median offer different conclusions. Mean results indicate that subsidiaries of MNCs have higher income tax burden, supporting the null hypothesis. However, median results indicate opposite results, supporting the alternative hypothesis.

It is interesting to note that there are three subsidiaries of MNCs and two domestic companies having a null current income tax expense despite recorded pre-tax income in each observed year. One of the subsidiaries, already mentioned in the second section of the paper, has special tax exemptions though it has a right to use investment tax incentive. Other two subsidiaries use foreign dividend tax credit and investment tax incentive. Two domestic companies also use investment tax incentive to lower their ETR1 to 0%.

3.2.2. Statistical tests

Table 4 shows the results of independent samples t-tests examining significance of difference between subsidiaries of MNCs and domestic companies in ETR1 and ETR2.

Table 4 Results of independent samples t-tests

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
ETR1	Equal variances assumed	23.864	0.000	1.149	364	0.251
	Equal variances not assumed			1.107	249.614	0.269
ETR2	Equal variances assumed	14.267	0.000	1.091	364	0.276
	Equal variances not assumed			1.037	207.888	0.301

Although subsidiaries of MNCs have higher mean ETR1 and ETR2, and lower median ETR1 and ETR2, independent samples t-tests suggest that these differences are not statistically significant. Since Levene's test p-value is 0.000, it is more appropriate to rely on "Equal variances not assumed" results.

It should be noted that independent samples t-tests examine only the impact of ownership type on effective income tax rates without accounting for potential impact of other variables that influence effective income tax rates. Therefore, multiple regression analysis is employed in order to control the impact of ownership type on effective income tax rates for variability in company size, leverage, profitability and capital intensity.

3.2.3. Correlation analysis

Table 5 shows correlation matrix with Pearson's coefficients reported. Results show that effective income tax rates are strongly positively correlated, while ownership type does not exhibit significant correlation with either ETR1 or ETR2.

Table 5 Pearson's correlation matrix

	ETR1	ETR2	OWN	SIZE	LEV	PROF	CAPIT
ETR1	1.000						
ETR2	***0.733	1.000					
OWN	-0.060	-0.057	1.000				
SIZE	***-0.331	***-0.176	0.054	1.000			
LEV	0.010	-0.041	**-0.126	**-0.107	1.000		
PROF	*-0.095	***-0.141	-0.036	*-0.101	***-0.147	1.000	
CAPIT	***-0.397	***-0.208	***0.210	***-0.382	***-0.143	-0.066	1.000

Note: statistically significant at 10% (*), 5% (**) and 1% (***) level.

Capital intensity is a variable that has the strongest correlation with both ETR1 and ETR2, though this correlation is only of medium magnitude. On the other hand, there is no strong correlation among independent variables, so multicollinearity problems are not expected.

3.2.4. Regression analysis

Table 6 shows multiple regression estimates. Since two effective income tax rate measures are used, there are two regression models to be reported. Table reports Ordinary

Table 6 Regression analysis estimates

	Dependent: ETR1		Dependent: ETR2	
	OLS	Random-effects	OLS	Random-effects
Intercept	***56.743	***58.245	***85.181	***86.250
	(7.527)	(5.556)	(4.342)	(4.086)
OWN	0.155	0.530	-1.977	-1.828
	(0.132)	(0.315)	(-0.646)	(-0.553)
SIZE	***-2.249	***-2.241	**-3.265	**-3.280
	(-4.502)	(-3.229)	(-2.511)	(-2.344)
LEV	*-3.031	**-4.084	**-9.901	**-9.992
	(-1.737)	(-2.016)	(-2.180)	(-2.146)
PROF	***-0.183	***-0.297	***-0.538	***-0.614
	(-3.195)	(-4.564)	(-3.611)	(-3.973)
CAPIT	***-18.023	***-18.721	***-23.104	***-23.529
	(-6.449)	(-4.893)	(-3.177)	(-3.014)
Adjusted R^2	0.210	0.140	0.081	0.075
F-value	***20.431	***12.849	***7.450	***6.930

Note: Beta coefficients in front of the parentheses, t-statistics in the parentheses; statistically significant at 10% (*), 5% (**) and 1% (***) level.

Least Squares (OLS) and random-effects panel regression estimates. Breusch-Pagan Lagrange multiplier tests suggest that random-effects (OLS) analysis is more appropriate in first (second) reported model. Results of these tests are reported in Table 7.

It should also be noted that fixed-effects regression method cannot be employed in this research due to the near singular matrix problem since each company has the same OWN value (0 or 1) in each observed year. Therefore, Hausman test is not conducted.

Table 7 Breusch-Pagan Lagrange Multiplier tests

Dependent variable	Cross-section	Test Hypothesis Time	Both
ETR1	65.583	1.431	67.014
	(0.000)	(0.232)	(0.000)
ETR2	2.137	0.966	3.104
	(0.144)	(0.326)	(0.078)

Note: p-values in parentheses.

According to the adjusted R^2 values, presented models poorly explain variations of ETR1 and ETR2. OLS and random-effects regression estimates are highly consistent. They support the independent samples t-tests findings indicating that there is no significant difference between subsidiaries of MNCs and domestic companies in either ETR1 or ETR2. OWN is the only variable insignificant in any regression model. Regression results are robust to change of effective income tax rate measure.

It is necessary to point out that effective income tax rates of MNC subsidiaries may be lowered due to different tax incentives, not only the special tax incentives granted to them. For example, income tax burden can be considerably reduced using tax losses carryforward as tax losses can be carried forward in five-year period. In addition, the RS offers tax incentive for investment in fixed assets in ten-year period. Transfer pricing and tax consolidation rules enable further reduction of effective income tax rates.

Among other independent variables, larger companies have both ETR1 and ETR2 lower, supporting political power hypothesis. More leveraged companies also have lower effective income tax rates. In addition, more profitable companies have lower income tax burden as they have more resources to invest in tax avoidance activities. Companies with higher share of fixed assets in total assets have lower income tax burden that can be partially explained with investment tax incentives.

On the one hand, it is known that one MNC was granted important tax incentives from the RS but, on the other hand, there is no significant difference in either ETR1 or ETR2 between subsidiaries of MNCs and domestic companies. Therefore, the research suggests that special income tax incentives granted to MNCs from the Serbian government are rarity, rather than a rule. It is indicative that such incentives are given only to foreign investors of strategic importance for economic development of the RS.

Developing countries often treat automotive industry as a key factor of economic and technological development (Jan & Hsiao, 2004). In addition, automotive industry significantly contributes to the gross domestic product and employment, particularly in industrial countries (Irandoust, 1999). Therefore, it is not surprising that an automotive industry MNC has been given special tax incentives in the RS.

Absence of special tax incentives does not mean that MNCs do not enjoy other types of incentives in the RS. For example, the RS made considerable financial incentives (i.e.

grants) available to attract foreign capital. These financial incentives are regulated by special legal act – Regulation on Determining the Criteria for Granting the Incentives with a View to Attract Foreign Direct Investment (The Official Gazette of the RS, no. 1/2019).

4. CONCLUSION

Research in this paper captured 50 subsidiaries of MNCs and 50 domestic companies to examine whether MNCs enjoy special tax incentives granted from the RS, i.e. whether MNCs have more favorable income tax treatment than other companies in the RS. In this regard, two effective income tax rate measures are used: ETR1 (Current effective income tax rate) and ETR2 (Cash effective income tax rate).

In general, research results indicate that subsidiaries of MNCs do not have preferential income tax treatment. Results are robust to change in effective income tax rate measure. ETR1 and ETR2 mean results indicate that subsidiaries have higher income tax burden, while ETR1 and ETR2 median results suggest the opposite. However, these differences are not statistically significant.

It can be concluded that special tax incentives given to MNCs are rarity, rather than a rule. They are granted only to foreign investors of strategic importance for the RS economy, such as an automotive MNC analyzed in the second section of the paper. In addition, it is noticeable that subsidiaries of MNCs in the RS lower their income tax burden with mechanisms that are also available to domestic companies, such as investment tax incentive. Therefore, there is not enough evidence to reject null research hypothesis.

Research results have certain limitations. It is possible that results would be different if sample size or sampling period were changed. As there are important cross-country differences in tax systems and attitudes on FDIs importance, research results might be different in other countries. It is also necessary to point out that MNCs can avoid taxes through related-party transactions, not only through the host country support. Employed effective income tax rates do not capture effects of tax avoidance through such transactions.

Future research should include more companies and more host countries, primarily in South Eastern Europe, in order to compare results. Also, future research should tend to find additional determinants of effective income tax rates since employed independent variables poorly explain variations of effective income tax rates. Future research should also include other incentives granted to MNCs, not only income tax incentives.

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ODNOS MULTINACIONALNIH KOMPANIJA I REPUBLIKE SRBIJE: KONTEKST POREZA NA DOBITAK

Zemlje domaćini, posebno zemlje u razvoju, neretko obezbeđuju poreske podsticaje kako bi privukle strani kapital multinacionalnih kompanija (MNK), očekujući pozitivne efekte stranih direktnih investicija na ekonomski razvoj zemlje. Takođe, u literaturi je dominirajuće mišljenje da MNK imaju dovoljno moći da, u pregovorima sa zemljom domaćinom, ostvare značajne poreske podsticaje. S obzirom na to da je jedna MNK dobila značajne poreske podsticaje od Republike Srbije (RS), u radu je ispitano da li filijale MNK imaju povoljniji poreski tretman dobitka u odnosu na domaće kompanije u RS. Rezultati statističke analize pokazuju da filijale MNK nemaju značajno niže opterećenje porezom na dobitak u odnosu na domaće kompanije, sugerišući da su poreski podsticaji koje dobijaju MNK od RS pre izuzetak, nego pravilo. Istraživanje je, takođe, pokazalo da filijale MNK primarno koriste poreske podsticaje koji su podjednako dostupni i domaćim kompanijama, kao što su poreski podsticaji po osnovu ulaganja u osnovna sredstva. Rezultati istraživanja su robusni na promene merila opterećenja porezom na dobitak.

Ključne reči: *multinacionalne kompanije, domaće kompanije, zemlje domaćini, porez na dobitak, poreski podsticaji, Srbija.*

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Preliminary Communication

JOB SATISFACTION OF ACADEMIC STAFF IN THE HIGHER EDUCATION SYSTEM OF SERBIA: A PILOT STUDY

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Agneš Slavić[1], Julija Avakumović[2], Nemanja Berber[1]

[1]University of Novi Sad, Faculty of Economics in Subotica
[2]PhD student - University of Novi Sad, Faculty of Economics in Subotica

Abstract. *In the turbulent business environment of today, the competitiveness of all organizations is primarily based on intangible resources. Due to global competition, the permanent actualization of employee competencies is imperative for the long-term survival of organizations. The higher education system bears a special responsibility in this process, as it provides an upgrade for the development of the previously obtained competencies of future employees. Higher education is the system focused on dual core functions of knowledge creation and knowledge transmission through the processes of research and teaching (Houston et al, 2006, 17). To ensure high-level competences in future employees, it is crucial for the higher education system (teaching staff) to provide students with the latest knowledge in their field. The job satisfaction of academic staff is reflected in the quality of teaching and communicating with students (Runhaar, 2017, 646-647). The aim of this paper is to determine the level of general and partial satisfaction of teaching staff at the institutions of higher education in the Republic of Serbia. The method implemented for determining the level of satisfaction, was Spector's Job Satisfaction Survey – JSS (Spector, 1985), in the form of an on-line questionnaire. The pilot research was conducted in December 2018 and January 2019. The sample consists of 58 respondents - teachers from higher educational institutions in the Republic of Serbia. The results of general job satisfaction survey indicate that teachers are generally ambivalently satisfied with their job, they are neither satisfied, nor dissatisfied. The results of partial satisfaction show that teaching staff is most satisfied with the nature of their job.*

Key words: *higher education, job satisfaction, job satisfaction of academic staff, general job satisfaction, partial job satisfaction*

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Corresponding author: Nemanja Berber
University of Novi Sad, Faculty of Economics in Subotica, Segedinski put 9-11, 24000 Subotica, Serbia
E-mail: berber@ef.uns.ac.rs

1. INTRODUCTION

Knowledge and human resources are the basis of every society. Employee development is directly related to the performance of the employees and also to the performance of the organization (Szabó et al., 2019). Bogićević Milikić (2019) points out that learning and development is directed towards improving individual and organizational performance through the development of an employee's capacity to contribute to the organization's efficiency. Stronger human resource development requires stronger links between the education and research systems and all other sectors, in order to make better use of existing and created resources through higher education (RS Scientific and Technological Development Strategy, 2016, 5). Education system of a society is a key determinant of its development (Jovanović-Kranjec & Despotović, 2018), while investments in education, research and development, and innovation result in knowledge-driven and sustainable development (Jednak et al., 2018; Krstić et al., 2018), and higher competitiveness of a country (Jovanović, 2018).

The situation in Serbia's education system has been influenced by social, political and economic changes in the past two decades. There is an expressed need for reforms in education in order to rebuild the school system, as well as improve and develop education, as a part of the complex reforms of the whole society (Hebib & Spasenovic, 2011, p. 376).

In Serbia, the modern reforms of higher education system started with the implementation of the Bologna Declaration and the establishment of the Commission for Accreditation and Quality Assurance (The Law on Higher Education of the Republic of Serbia, 2005), which was revised in 2018 into the National Accreditation Body (The Law on Higher Education of the Republic of Serbia, 2017). The goal of the reforms in the education system was to modulate the existing curriculum and study plans with those similar in the European Higher Education Area, thereby enabling the identification and recognition of a previously acquired education level. The generated "European model" in higher education system in Serbia, has normative (cooperation, dialog, variation, mobility) and structural dimensions (Bologna process). Given the teaching staff's international orientation, it has become easier to participate in international networks of higher education.

To achieve the established mission and vision, the Strategy of education determines specific objectives: stimulating excellence and relevance of scientific research in Serbia; strengthening the integration of science, economy and society to stimulate innovations; establishing efficient management system in science and innovation in Serbia; assuring excellence and availability of human resources in science, economy and social affairs; promoting international cooperation of science and innovation; increasing investment in research and development through public funding and through stimulating the funding from the business sector (Strategy on Scientific and Technological development of the Republic of Serbia for the period 2016-2020, 2016, p. 8).

The current Law on higher education in Serbia defines these job positions at faculties: full professor, associate professor, assistant professor and assistant, while at colleges and at colleges of applied studies these are: professor of applied studies, higher college teacher, college teacher and assistant at college. Less than 10% of Serbia's population has a degree in higher education, in fact only 6.5% (Statistical Pocketbook of Serbia, 2018, p. 122-130).

Academic staff at higher educational institutions has to be equipped with the latest knowledge in their field when teaching their students. The motivation and ability of

academic staff to develop students' competences are influenced by many factors, but among them the satisfaction with their own working environment is one of the most crucial ones (Runhaar & Sanders, 2016, p. 806-808). A positive and healthy working environment will result in a satisfied and motivated member of academic staff (Stankovska et al., 2017, p. 159). This is especially true since higher education working environment is the key to organization success and competitive advantage (Pham-Thai, 2018, p. 951). The results of an organization are the sum of their employees' results; actually, the organization's results mirror their results of the employees' job satisfaction or dissatisfaction (Spector, 1997, p. 55).

The aim of this paper is to determine the level of job satisfaction of academic staff at higher educational institution in Serbia, through the level of general job satisfaction, as well as to determine the level of partial satisfaction concerning the nature of work, co-workers, pay, promotion, fringe benefits, contingent rewards, communication, supervision, and working conditions.

2. THEORETICAL BACKGROUND

2.1. Job Satisfaction

Job satisfaction is a vital factor in the field of human resource management, based on employee`s perception – to what extent does the job offer exactly what the employee expects from it (Amaresena et al, 2015, p. 541; Stankovska et al, 2017, p. 160). Job satisfaction can be considered as a general attitude towards work, or satisfaction according to various dimensions of work, such as: pay, job promotion possibility, superiors and colleagues (Zimanji, Šušnjar, 2007, p. 135). It is an enjoyable or positive emotional state resulting from the appraisal of one`s job or job experiences (Locke, 1976; Đorđević et al., 2017, p. 265). Paul E. Spector highlighted three reasons concerning the importance of job satisfaction: humanitarian perspective of work, positive emotional attitude of job and totality positive effect on organization performance (Spector, 1997, p. 2).

Job satisfaction can be defined as a cognitive, affective and evaluative individual reaction to a job. The cognitive component contains what a person believes to know about the subject of attitude; the evaluative component refers to how much the given person likes or dislikes the goods (or person); and behavioristic component contains certain predisposition to acting in a certain direction (Zimanji, Šušnjar, 2007, p. 135). Job satisfaction is an attitude – a feeling of relative like or dislike towards something. Employees' attitudes consist of feelings, thoughts, and intentions to act. An employee as an individual often adjusts their own attitude in accordance with the attitude of the group (team) he/she belongs to. Generally, attitudes are acquired for a long time, so that job satisfaction or dissatisfaction occurs when an employee receives more and more information about his/her work place. If the causes of job satisfaction are determined, they cannot be ignored later, because those causes may vary and lead to job dissatisfaction. Permanent monitoring of job satisfaction is a need based on the fact that job satisfaction is a dynamical attitude. Job satisfaction is a part of life satisfaction and has interactive influence. Apart from job satisfaction, life satisfaction is affected by family, religion, policy and vacation, too (Newstrom, 2007, p. 204-205).

The antecedents of job satisfaction can be classified into two major categories. First, the job environment itself and factors associated with the job. This includes how people

are treated, the nature of the task, relations with other people in the workplace, and rewards. Second, there are individual factors such as personality and prior experiences. The two categories of antecedents often work together in order to influence employee satisfaction. The basic assumption of job characteristics theory is that people can be motivated by the satisfaction they experience through performing their tasks. When they find their work to be enjoyable and meaningful, people will like their jobs and will be motivated to perform their jobs well (Spector, 1997, p. 30-31).

If there is harmony between the personality of the employee and the job requirements, the employees will better use their knowledge and ability, which is beneficial and allows them to fulfill their needs for achievement, as well as achieve greater job satisfaction. Finding harmony of personality and job requirements is important for the organization, especially in relation to work quality (Hadžić & Nedeljković, 2010, p. 171).

Job satisfaction has a direct impact on professional (Shamina, 2014, p. 1-3) and organizational commitment (Trivellas & Santouridis, 2016, p. 171) and also motivates employees to increase their productivity (Khan et al, 2014, p. 54). Job satisfaction, as an attitude, has significant relations with organizational performances, job performances of employees, organizational citizenship behavior (Ivanović-Đukić et al., 2018, p. 13), organizational justice (Đorđević et al., 2018, p. 148), turnover intentions and absenteeism (Došenović, 2018, p. 365).

Research on job satisfaction should include demographic factors such as gender, age, years of working experience, number of years spent on the work position and level of work position (Castillo & Cano, 2004, p. 68; Hadžić & Nedeljković, 2010, p. 187).

The measuring of job satisfaction is important, because the results may indicate differences between employee expectations of the job and what the job truly offers (Amaresena et al, 2015, p. 544; Hadžić & Nedeljković, 2010, p. 42-52). Today, there are different models of measuring job satisfaction, where the dependent variable is job satisfaction, and the independent variables can be compensation, work environment, characteristics of the job, organizational decisions, leadership, interpersonal relationships, self-respect, workload, autonomy, social recognition and supervision (Azumah et al, 2017, p. 3).

2.1.1. Job satisfaction of academic staff in higher education

Job satisfaction is important to perform any job adequately. While satisfaction with the job is an important phenomenon in any sector, it is especially vital in the education sector (Nigama et al, 2018, p. 2645). Job satisfaction of academic staff is crucial to retain teachers and a significant determinant of the commitment of academic staff, which acts as feedback regarding efficiency of work in a school as organization (Munir & Khatoon, 2015, p. 454).

Job satisfaction of the staff employed in educational institutions refers to the effective relation of teachers to their role as lecturers and to the function of the observed relation between what employees expect from the teaching and what the educational institution really offers them (Jošanov-Vrgović, 2012, p. 16).

Satisfaction of academic staff brings benefits to teachers, students and educational institution. Teachers play an important role in creating better environment and working atmosphere at universities, therefore, teachers who are satisfied with their job can significantly contribute to how successful the educational institution as an organization is (Ahmad et al., 2018).

Job satisfaction of employees in higher education is reflected through a better chance for promotion and professional development (Al-Rubaish et al., 2011, p. 1), status within the society (Saiti & Papadopoulos, 2014, p. 74), research funding (Ali, 2009, p. 291), flexible working time (Popović et al., 2015, p. 34), good work environment (Stankovska et al., 2017, p. 160), elements of organizational culture (Andreassi et al., 2014, p. 56; Ali, 2009, p. 290), good working experience (Qazi & Jeet, 2017, p. 179) and adequate compensation (Khalid et al., 2012, p. 128; Nandan & Krishna, 2013, p. 134; Bodla et al., 2014, p. 23).

Research about job satisfaction can help management and teachers to further develop the quality of education (Toker, 2011, p. 156).

In a study at the state university in Skopje (North Macedonia), the authors used the JSS questionnaire (Job Satisfaction Survey: Spector, 1985) to measure general job satisfaction. JSS contains 36 items, grouped in 9 partial indicators related to employees' attitude about the job: payment, promotion, supervision, benefits, rewards, procedures, colleagues, nature of job, and communication at workplace. The results of general job satisfaction indicated that academic staff are satisfied with their job, while the analysis of partial indicators show that academic staff are satisfied with supervision but dissatisfied with benefits and rewards (Stankovska et al., 2017, p. 163).

To determine the relation between HRM practice and job satisfaction, authors Bodla et al. (2014) used correlation and regression analysis in their study. The authors proved that the increase of working performance results in the increase of job satisfaction level, and there is a positive relation between performance appraisal and job satisfaction. The regression coefficient shows that carrier planning and pay increase has a positive and significant impact on the increase of job satisfaction of academic staff.

A study at a state university in Sri Lanka on the assessment of job satisfaction among academic staff used 5-point Likert`s scale. The result concerning general job satisfaction is 3.95, which is higher than 3 (the neutral value in this example) and it means that academic staff are satisfied (Amaraesena et al., 2015, p. 547). Another study (Khalid, 2012, p. 130-131) obtained at universities in Pakistan (both state universities and private ones) indicated differences in compensation between state and private universities. Teachers as employees in the private sector are satisfied with their payment and promotion, while employees at state universities are satisfied with the nature of work and job security. One more study, conducted by authors Machado et al. (2011) indicated that general job satisfaction is higher at private universities than at state universities. Among the analyzed partial indicators, satisfaction with the nature of job is the highest and satisfaction with compensation is the least. The results of this study indicate that teachers are more satisfied than assistants. The level of general job satisfaction measured on a 10-point Likert`s scale is 6.7 (Machado et al, 2011, p. 1720).

The results of job satisfaction research conducted at the Faculty of Agriculture in Belgrade (Serbia) indicated that employees are satisfied with flexible working hours, but dissatisfied with payment, which is highly important since it has been found that pay satisfaction is related positively to commitment (Adeoye, 2019). The level of general job satisfaction measured by a 6-point Likert`s scale is 3.85 (Popović et al., 2015, p. 38). It is important to highlight that the standard of living in Serbia is lower than in the European Union.

Based on previous research, in the context of research, the authors formulated the present research goals. The first goal is to determine the level of general job satisfaction

of academic staff at higher educational institution in Serbia. The second goal is to determine the partial job satisfaction of academic staff in Serbia based on partial indicators of job satisfaction: nature of job, co-workers, pay, promotion, contingent rewards, flexible benefits, communication, supervision and job procedures (Spector, 1997, p. 4).

3. METHODOLOGY

To determine the level of job satisfaction of academic staff, the authors performed a pilot research and used Spector Job Satisfaction Survey (JSS) (Spector, 1997) officially translated into Serbian language (Branko Mladenović, 2013), using a 6-point Likert`s scale. The first part of the questionnaire contains 36 questions. The second part of the questionnaire contains 19 questions on demographic and organization data. For data process and data analysis IBM SPSS version 23 was used.

The value of general job satisfaction on the sample of 58 employees is determined by a JSS questionnaire (Spector, 1985; Spector 1997), items 1-36. The questionnaire implements Likert's 6-point scale, where 1 refers to 'I highly disagree' and 6 refers to 'I highly agree'. The results can range from 36-216, so the results from 36 to 108 represent dissatisfaction with the job, the results between 108-144 represent ambivalence, while results ranging from 144 to 216 represent satisfaction with the job.

The JSS questionnaire measures partial job satisfaction, too: satisfaction with the nature of the job (items 8,17,27,35), coworkers (items 7,16,25,34), pay (items 1,10,19,28), promotion (items 2,11,20,33), contingent rewards (items 5,14,23,32), flexible benefits (items 4,13,22,29), communication (items 9,18,26,36), supervision (items 3,12,21,30) and job procedures (items 6,15,24,31). The sum of the 4 items for each partial indicator may indicate dissatisfaction (if it is less than 4), ambivalence (between 3 and 4) and satisfaction (above 4).

The Cronbach's Alpha coefficient, which measures the internal consistency (reliability) of the scale, was 0.713 for 36 items. This is an acceptable level of internal consistency of the scale (Streiner, 2003).

Table 1 Sample structure according to the type of higher educational institutions

Type of institution	Number of respondents	Percent (%)
Faculty	28	48.3
College	2	3.4
College of applied studies	28	48.3
∑	58	100.0

Source: Authors' research

As stated previously, the sample included 58 respondents (Table 1), employed as academic staff at a higher educational institution in the Republic of Serbia (28 employed at faculties, 2 at colleges and 28 at colleges of applied studies).

Analyzing the gender of 58 respondents, 44 (76%) were women, while 14 (24%) were men. The observed sample included all working positions at the higher education system in Serbia: at colleges or universities - full professor, associate professor, assistant professor and assistant and employed at college or college of applied studies - professor of applied studies, higher college teacher, college teacher and assistant at college (Table 2).

Table 2 Sample structure according to the work position of employees at HE institution

Work Position at HE institution	Number of respondents	Percent (%)
Full professor	4	6.9
Associate professor	4	6.9
Assistant professor	11	19
Professor of applied studies	24	41.4
Higher college teacher	1	1.7
College teacher	4	6.9
Assistant	9	15.5
College Assistant	1	1.7
∑	58	100.0

Source: Authors' research

Based on the working position, the sample included 4 full professors (6.9%), 4 associate professors (6.9%), 11 assistant professors (19%), 9 assistants (15.5%), 24 professors of applied studies (41.4%), 1 higher college teacher (1.7%), 4 college teacher (6.9%) and 1 assistant at college (1.7%). According to the years of work experience, interviewees are grouped as follows: less than 5 years of experience, between 5 and 15 years of experience, between 16 and 20 years of experience, between 21 and 25 years of experience and more than 25 years of experience (Table 3).

Table 3 Sample structure according to the years of working experience

Years of experience	Number of respondents	Percent (%)
< 5	7	12.1
5-15	25	43.1
16-20	11	19
21-25	7	12.1
>25	8	13.8
∑	58	100.0

Source: Authors' research

The sample included 7 employees with less than 5 years of experience (12.1%), 25 employees with experience between 5-15 years (43.1%), 11 employees with experience between 16-20 years (19%), 7 employees with experience between 21-25 years (12.1%) and 8 employees with more than 25 years of experience (13.8%). According to the age of respondents, they were grouped as follows: aged between 20-29, aged between 30-39, aged between 40-49, aged between 50-59 and more than 60 years old (Table 4).

Table 4 Sample structure according to the age of respondents

Age of employees	Number of respondents	Percent (%)
20-29	2	3.4
30-39	20	34.5
40-49	13	22.4
50-59	22	37.9
>60	1	1.7
∑	58	100.0

Source: Authors' research

The sample included 2 employees aged between 20-29, 20 employees aged between 30-39 (34.5%), 13 employees aged between 40-49 (22.4%), 22 employees aged between 50-59 (37.9%) and 1 employee older than 60.

4. RESEARCH RESULTS

The obtained result of 129.86 for general job satisfaction indicates ambivalence. Based on the sample of 58 employees at higher educational institutions in Serbia, the authors found that the employees are neither satisfied with the job, nor are they dissatisfied. Table 5 presents results of general job satisfaction, depending on the type of higher educational institution where employees are employed.

Table 5 General job satisfaction depending on the type of institution

Type of institution	Number of respondents	General job satisfaction - average
Faculty	28	132.32
College	2	118.00
College of applied studies	28	128.25
∑	58	129.86

Source: Authors' research

Employees are most satisfied at faculties (132.32), and least satisfied at colleges (118) and colleges of applied studies (128.25). The average values of general job satisfaction depending on the type of higher educational institution belong to the category of ambivalent general satisfaction.

Table 6 presents the results of general job satisfaction, depending on the work position at the higher educational institution. Assistants (139.22) are the most satisfied ones. The average values of general job satisfaction depending on the work position at higher educational institution belong to category of ambivalent general satisfaction. Based on the obtained values, academic staff is not satisfied, but neither are they dissatisfied with their job.

Table 6 General job satisfaction depending on the work position

Work position at HE institution	Number of respondents	General job satisfaction - average
Full professor	4	128.50
Associate professor	4	130.75
Assistant professor	11	126.91
Professor of applied studies	24	127.92
Higher teacher at college	1	114.00
College teacher	4	133.00
Assistant	9	139.22
College Assistant	1	130.00
∑	58	129.86

Source: Authors' research

Table 7 presents the results of general job satisfaction, depending on the years of work experience of employees at the higher educational institution. According to the years of experience, the most satisfied ones are employees with less than 5 years of experience (135), while the least satisfied employees are those who have more than 25 years of experience (119.37). The average values of general job satisfaction depending on the years of work experience at a higher educational institution belong to category of ambivalent general satisfaction. Academic staff is neither satisfied, but nor dissatisfied with the job.

Table 7 General job satisfaction depending on the years of work experience

Age of employees	Number of respondents	General job satisfaction - average
<5	7	135.00
5-15	25	132.12
16-20	11	129.82
21-25	7	128.71
<25	8	119.37
∑	58	129.86

Source: Authors' research

Table 8 presents results of general job satisfaction depending on the age of employees at a higher educational institution. The most satisfied are employees between 20-29 years of age (155.50) and the least satisfied are employees with more than 60 years (125). According to the measurement system of Spector's JSS questionnaire (Spector 1985, Spector 1997), only one category of respondents (those between 20 and 29 years of age) is generally satisfied with the job (155.50), since this result falls into the category of job satisfaction (between 144-216). Other employee groups based on their age belong to the ambivalent category.

Table 8 General job satisfaction depending on the age of employees

Age of employees	Number of respondents	General job satisfaction - average
20-29	2	155.50
30-39	20	132.40
40-49	13	123.15
50-59	22	129.41
>60	1	125.00
∑	58	129.86

Source: Authors' research

Table 9 presents the results of partial indicators of job satisfaction at higher educational institutions in Serbia.

Looking at the results of partial job satisfaction calculated with the items entering the individual subscales, the following values have been obtained: satisfaction with the nature of the job (17.34); co-workers (14.81); pay (14.43); promotion (14.16); contingent rewards (13.12); flexible benefits (14.45); communication (13.78); superiors (13.55) and working conditions (14.22). The partial satisfaction scores indicate that teachers in the higher

education system of Serbia are only satisfied with the nature of the job (grade 17.34 higher than 16), while with other causes of satisfaction, teachers are ambivalent, i.e., neither satisfied nor dissatisfied.

Table 9 Partial job satisfaction at higher educational institutions in Serbia

	Range	Min	Max	Mean	SD
Nature of job	12.00	10.00	22.00	17.3448	3.08677
Co-workers	9.00	10.00	19.00	14.8103	2.06438
Pay	12.00	7.00	19.00	14.4310	3.22334
Promotion	20.00	4.00	24.00	14.1552	4.81154
Contingent rewards	15.00	6.00	21.00	13.1207	2.81024
Flexible benefits	10.00	9.00	19.00	14.4483	1.93012
Communication	16.00	5.00	21.00	13.7759	3.16806
Supervision	15.00	4.00	19.00	13.5517	3.39335
Job procedures	12.00	9.00	21.00	14.2241	2.54119

Source: Authors' research

5. Discussion and Practical Implications

Based on the results of the survey conducted on a sample of 58 respondents employed in higher educational institutions in Serbia, on the level of general and partial job satisfaction it can be concluded that the employees are not satisfied with their work, but they are not dissatisfied, either, therefore there is an ambivalent level of general job satisfaction. Analyzing the general job satisfaction of the special subgroups of respondents, it can be stated that employees at faculties are more satisfied than employees in colleges and colleges of applied studies. At faculties, assistants are the most satisfied, while at colleges and colleges of applied studies the most satisfied group are college teachers. Taking into consideration the years of work experience, the most satisfied employees are those who have less than 5 years of service, while based on age, the most satisfied employees are those between 20 and 29 years of age.

Similar research conducted by authors Nandan & Krishna (2013) indicated that the more satisfied employees tend to be the younger population at junior positions, because they have a motive to prove themselves in research work, while their older colleagues spend more time with family (Slavić & Avakumović, 2018, p. 1219).

Analyzing indicators of partial job satisfaction (nature of job, co-workers, pay, promotion, fringe benefits, contingent rewards, communication, supervision and working conditions), the authors conclude that employees are most satisfied with nature of job, and least satisfied with supervision, communication and pay. Similar results can be found in the research of Popović et al. (2015) and Saiti & Papadopoulos (2014) which indicated that academic staff is most satisfied with nature of job, and least satisfied with compensation (pay, fringe benefits and contingent rewards) (Slavić & Avakumović, 2018, p. 1218-1219).

During the analysis of the research results on job satisfaction it is important to factor in the country's situation where the research is conducted, because there are significant differences between national income in different socio-economic systems. Sometimes in less-developed countries it is not possible to increase the salary and give rewards, and because of that it is impossible to react to indicators of partial satisfaction with compensation (Popović et al., 2015, p. 38).

In this paper two research goals were formulated. The results of the general job satisfaction indicate that teachers are generally ambivalently satisfied with their job, they are not satisfied, but neither are they dissatisfied. The research results on partial job satisfaction confirmed that respondents are satisfied with the nature of job. Among the analyzed nine indicators of partial job satisfaction, satisfaction with the nature of job ranks highest.

6. CONCLUSIONS

Job satisfaction is an important factor in the field of human resource management, based on employee`s perception. The factors influencing job satisfaction can be classified as factors associated with the job (working environment, the nature of the task, relations with other people at the workplace) and individual factors (personality and prior experiences). The adequate measurement of job satisfaction is of key importance, because results may indicate significant differences between employees' expectations of the job and what the job truly offers.

Job satisfaction of staff employed at higher educational institutions refers to the effective relation of teachers to their role as lecturers and function of observed relation between what employees expect from teaching and what the educational institution really offers. Satisfaction of academic staff brings benefits to teachers, students, as well as to the educational institutions themselves.

The aim of this paper was to determine the level of general and partial satisfaction of teaching staff at the institutions of higher education in the Republic of Serbia.

The results of the general job satisfaction indicated that teachers are generally ambivalently satisfied with their job, they are not satisfied, but neither dissatisfied, except for the respondents between 20 and 29 years of age.

The limitation of this research is the small and non-representative sample. Present authors plan to conduct the same research on a larger sample, which will represent the type and ownership of higher education system of Serbia, and will include the influence of different HRM activities on job satisfaction.

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ZADOVOLJSTVO POSLOM NASTAVNOG KADRA U VISOKOM OBRAZOVANJU SRBIJE: PILOT ISTRAŽIVANJE

U današnjem turbulentnom poslovnom okruženju konkurentnost organizacija prevashodno je bazirana na nematerijalnim resursima. Kako je konkurencija sve snažnija, stalna aktualizacija kompetencija zaposlenih nameće se kao imperativ dugoročnog opstanka organizacije. Posebnu odgovornost u tom procesu zauzima visokoškolsko obrazovanje, koje obezbeđuje nadogradnju i pruža dalji razvoj prethodno stečenih kompetencija budućih zaposlenih. Visoko obrazovanje je sistem u kojem se stvaraju i prenose znanja kroz proces istraživanja i odvijanja nastave. (Houston et al, 2006, 17) Predavači imaju ključnu ulogu u razvoju kompetencija polaznika. Sadržaj i metode obuke određuju rezultate procesa obuke, odnosno novostečeno znanje, sposobnosti i osećanja polaznika. Kvalitet nastave u velikoj meri zavisi i od zadovoljstva nastavnog kadra. (Runhaar, 2017, 646-647) Cilj rada je utvrditi nivo opšteg i parcijalnog zadovoljstva nastavnog kadra u visokoškolskim ustanovama u Republici Srbiji. Kao metod utvrđivanja nivoa zadovoljstva korišćen je Spektorov Job Satisfaction Survey upitnik (Spector, 1985), koji je postavljen kao on-line upitnik. Istraživanje je sprovedeno tokom decembra 2018-te i januara 2019-te godine. Uzorak predstavlja 58 ispitanika, zaposlenih u nastavi na visokoškolskim ustanovama u Republici Srbiji. Rezultati opšteg nivoa zadovoljstva ukazuju na ambivalentnost zadovoljstva poslom nastavnog osoblja. Posmatrajući parcijalne nivoe zadovoljstva, nastavno osoblje je najzadovoljnije prirodom posla.

Ključne reči: *visoko obrazovanje, zadovoljstvo poslom, zadovoljstvo nastavnog kadra, opšte zadovoljstvo poslom, parcijalni pokazatelji zadovoljstva*

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Preliminary Communication

CAUSALITY BETWEEN EXCHANGE RATES AND FOREIGN EXCHANGE RESERVES: SERBIAN CASE

UDC 339.743(497.11)

Ivana Marjanović[1], Milan Marković[2]

[1]University of Niš, Faculty of Economics, Niš, Serbia
[2]University of Niš, Innovation Center, Niš, Serbia

Abstract. *The aim of this paper is to determine the relationship between the exchange rate (nominal and real) and foreign exchange reserves based on monthly data for the period from September 2006 to April 2019, using unit root tests and cointegration tests that take into account the possibility of structural break existence. The results of the causality test indicate that there is a long-term relationship between the nominal exchange rate and foreign exchange reserves. On the other hand, the existence of a long-term relationship between the real exchange rate and the foreign exchange reserves has not been confirmed, but there is a short-term causality, that is, the real exchange rate Granger-causes foreign exchange reserves.*

Key words: *exchange rate, foreign exchange reserves, unit root tests, cointegration tests, Granger causality, Vector Error Correction Model*

JEL Classification: C22, E44, F31

1. INTRODUCTION

Exchange rate is one of the most important determinants of the economic policy of each country. Although in the literature the most frequent is the fixed and floating exchange rate, there are several regimes of exchange rates between them. The Republic of Serbia has opted for such a regime, which implies free formation of the exchange rate on the foreign exchange market, but with certain interventions of the National Bank of Serbia. It is a regime of managed floating exchange rate. In this regime there is monetary independence, so that the central bank can influence external shocks by spending foreign

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Corresponding author: Ivana Marjanović
University of Niš, Faculty of Economics, Trg kralja Aleksandra Ujedinitelja 11, 18000 Niš, Serbia
E-mail: ivana.veselinovic@eknfak.ni.ac.rs

currency reserves. The National Bank of Serbia has the task of intervening in the foreign exchange market mainly to prevent excessive daily oscillations of the nominal exchange rate. This is to prevent possible speculative attacks since there is a higher degree of uncertainty due to a change in the exchange rate. If there is pressure on the foreign exchange market, which conditioned on the excessive growth of the exchange rate on a daily basis, the central bank will initiate the sale of foreign exchange, while, if the appreciation pressures are expected, the central bank will in that case buy foreign currency on the foreign exchange market. Such a policy allows for a certain degree of flexibility for the central bank and does not imply directing or holding a foreign exchange rate in certain oscillation zones. In addition to maintaining the stability of the foreign exchange rate of the dinar against the euro, the National Bank of Serbia (National Bank of Serbia, 2019) is used for: the settlement of the obligations of the Republic of Serbia towards foreign creditors, maintaining the stability of the banking system and financing deficit in foreign trade.

For forecasting the future movements in the exchange rates and foreign exchange reserves, and timely undertaking of corrective actions, it is desirable to determine the type and direction of their interdependence. Therefore, the objective of this paper is to investigate the relationship between the exchange rates (real and nominal) and foreign exchange reserves in the Republic of Serbia. However, when analysing economic time series, stationarity issues should be taken into consideration. Analysis of time series that do not meet the requirement of stationarity can lead to biased results and wrong conclusions about the results of statistical testing. Therefore, with the intention of proper establishment of the dependency among the time series, they should first be reduced to stationary ones. However, if the structural break is present, traditional test may be biased, therefore, it is necessary to account for the possible structural break while conducting unit root tests and cointegration tests. For that reason, in order to assess interdependence between foreign exchange reserves and exchange rate unit root tests and cointegration tests that allow for a structural break will be applied.

The paper is structured as follows: the second section discusses the theoretical background and provides a brief review of previous research regarding the relation of foreign exchange reserves and exchange rates. The third section describes the econometric methodology used for the analysis. The data set and empirical results are presented in the fourth section. Lastly, concluding remarks are provided.

2. THEORETICAL BACKGROUND

In the first decade of the 21st century, there was a significant increase in the amount of foreign exchange reserves held by central banks (Gantt, 2010). The stockpiling of reserves is the practice of many countries and the question is whether such policy is justified. On the one hand, holding high volume of reserves is costly, while on the other hand, the cost of holding reserves is insignificant relative to the economic consequences of a crisis (Aizenman & Marion, 2003). Nowak et al. (2004) state two main benefits rising from a high level of reserves: i) reduction of the likelihood of currency crises or a "sudden stop" (an unexpected reluctance by international creditors to renew their credit lines at times of market uncertainty); ii) lower external borrowing costs.

The motivation for the enhanced increase in the level of foreign exchange reserves in emerging economies in recent years was twofold. On the one hand, increasing security in the event of a currency crisis, while on the other hand it reflects the tendency of policy makers to prevent the appreciation of the exchange rate and maintain the competitiveness of their economies (Krusković & Maričić, 2015). However, central banks do not have the ability to mount up reserves indeterminately. Disproportionate reserve stockpiling involves substantial sterilization costs, due to the negative spread between the interest earned on reserves and the interest paid on the country's public debt, which enlarges with reserve accumulation (Gosselin & Parent, 2005). Regarding the optimal level of foreign exchange reserves Heller (1966) claims that it should be determined in the way that will make a balance between the costs of macroeconomic adjustment that may arise in the situation of a deficiency of reserves with the opportunity cost of holding reserves.

There is a universal view that the reserve requirements must be kept at an optimum level. However, this level can be determined in several ways. It is mostly a level that does not exceed the value of six-month imports of goods and services, or not lower than the value of the quarterly import. A surplus or shortfall in these resources can cause some repercussions on the national economy and make it more difficult for economic policy makers. Firstly, the low level of foreign exchange reserves is a serious problem. They are limited, and the transition below their minimum can lead to a reduction in the credit rating and the ability to borrow in the foreign market, and in the event of a serious shortfall, currency crises can occur. However, even a higher level is not a problem to be underestimated, especially when the country is burdened with price instability problems. In the absence of reserves, balance of payment deficits would have to be rectified through (Aizenman et al., 2012): a reduction in aggregate expenditures, imposition of macroeconomic adjustment costs, and a change in relative prices or "expenditure switching".

Edwards (1983) claims, based on the examination of previous studies, that demand for international reserves is a function of the scale of the country (measured by its total imports or total income), the variability of its payments, its degree of openness and the opportunity cost of holding reserves. The reserves are kept to finance international transactions, and also as a buffer stock to deal with unanticipated payment difficulties. If the aspect of international transaction financing is considered, the level of optimal reserves depends on the variability of international transactions. As reserves serve as buffered, whose role is to offset fluctuations in international transactions, it is expected that the optimal reserve stock is positively dependent on the magnitude of these fluctuations (Frenkel & Jovanovic, 1981). Flood and Marion (2002) state that are three trends in the international economy that may possibly have a significant influence on reserve holdings: 1) increasing capital mobility; 2) increasing frequency and intensity of currency and financial crises; and 3) increasing number of countries reporting a switch to flexible exchange rates.

A vast number of research has addressed the role of reserves and their relation to the exchange rate. Aizenman and Riera-Crichton (2008) indicated that international reserves soften the influence of terms of trade shocks on the exchange rate, and that this effect is important for developing but not for industrial countries. Nowak et al. (2004) investigated whether higher volume of reserves may decrease the volatility of the real exchange rate independently of the impact of the selected exchange rate regime or of the role of foreign exchange intervention, and provided the evidence of a negative non-linear effect of reserves on the short-term volatility of the real effective exchange rate, for a sample of

emerging market countries. Adler et al. (2019) examined the effect of foreign exchange intervention on the level of the exchange rate using an instrumental-variable panel approach and discovered that intervention affects the exchange rate in a meaningful way from a macroeconomic perspective. Viola et al. (2019) state that countries that adopt inflation targeting and a floating exchange rate typically intervene in the foreign exchange market through various mechanisms, both sterilized and non-sterilized, wherein one of the most common that lead a central bank to intervene in the foreign exchange market is recomposing reserves and smoothing out long-term exchange rate movements. Volatility of exchange rate may cause difficulties in international trade and investment decisions. Engel and Hakkio (1993) identified changes in expectations due to new information, the volatility of market fundamentals and speculative movements as main determinants of exchange rate volatility. Frömmel et al. (2011) state that with the intention to influence on the exchange rate changes the central bank can essentially use two instruments: foreign exchange interventions and interest rate changes. Several authors have examined the usefulness of foreign exchange interventions (Dominguez, & Frankel, 1990; Ito, 2002; Fatum, & Hutchison, 2003; Neely, 2005; Basu, 2012). Additionally, there is evidence of reduction of volatility due to foreign exchange interventions (Abenoja, 2003; Viola et al., 2019).

Serbia has been applying a managed-float exchange rate regime, and the inflation targeting regime has been in place since 2009. Under the inflation-targeting and managed-float framework, market forces are allowed to determine the value of the currency which reflect demand and supply for that currency in the foreign exchange markets (Bouraoui & Phisuthtiwatcharavong, 2015). The joint movements in EUR/RSD exchange rate and foreign exchange interventions of the National Bank of Serbia are presented in figure 1.

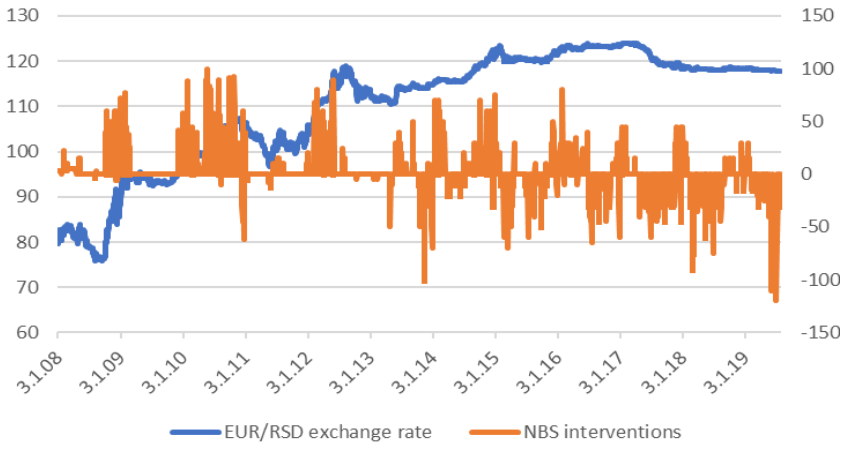

Fig. 1 Movements in EUR/RSD exchange rate and NBS foreign exchange interventions (on a daily basis)
Source: Authors presentation based on the data of the National bank of Serbia, 2019b.

Regarding factors that determine the level of foreign exchange reserves, in addition to the balance of payments, an important determinant of foreign exchange reserves is the applied exchange rate regime. It depends on the movement of a set of macroeconomic

variables over time (inflation, certain transmission channels, euroization of the economy, labour flexibility). Economies with internal problems and high inflation rates are generally opting for the fixed exchange rate regime, while countries that have a balance of payments problem choose a floating exchange rate. In a fixed exchange rate regime, the central bank is obliged to defend the established level of the exchange rate. The sustainability of this regime depends on the value of available foreign exchange reserves. With the floating exchange rate regime, there is no obligation on the central bank to maintain a certain level of the exchange rate, and the degree and number of foreign exchange interventions is lower. Foreign exchange reserves in this case fluctuate less, but since in this exchange rate regime it is possible for currency crises to emerge due to the formed negative expectations of market entities, their level will depend on the successful conduct of economic policy. The level and movement of foreign exchange reserves is shown in figure 2.

Fig. 2 Evolution of foreign exchange reserves of the National Bank of Serbia in the period from September 2005 to April 2019
Source: Authors' presentation based on the data of the National Bank of Serbia, 2019a.

The level of the exchange rate in the regime of floating exchange rate is formed on the basis of supply and demand in the foreign exchange market. Certainly, foreign trade flows (exports and imports of goods and services) are the most significant factors in exchange rate formation. Next, inflation is one of the important factors, as is the inflow and outflow of remittances from abroad. In addition, capital transactions (foreign direct investment, portfolio investment) have a strong impact, primarily in developing countries. Finally, one of the factors is the intervention of monetary authorities in order to mitigate smaller or larger fluctuations in the foreign exchange market, in regimes other than purely floating exchange rates. Other factors include interest rate, national income, investor expectations, and the state of the world economy.

On the other hand, the causal relationship between the exchange rate and the foreign exchange reserves is not a common topic of research, and there are only a few studies that have dealt with the examination of the short-term and long-term relationship between the stated variables.

Gokhale and Raju (2013) have investigated causality among exchange rate and foreign exchange reserves in India using a time series data during the period between 1980 and 2010. Their intention was to determine the influence of foreign exchange reserves on the exchange rate using the unit root test, Johansson cointegration test and Vector Auto Regression (VAR). The results of their study indicate that there is no long and short-term relation between exchange rate and foreign exchange reserves. Bearing in mind that India has managed floating exchange rate system they conclude that foreign exchange reserve accumulation in India could have been carried out with the aim of providing an adequate response to the possible currency crisis rather than a tool for regulating the exchange rate.

Kim (2003) has developed the structural VAR model to inspect together the effects of foreign exchange intervention and conventional monetary policy on the exchange rate. The results of the study specify that foreign exchange intervention has considerable influence on the exchange rate and responds to stabilize the exchange rate.

Bayat et al. (2014) have analysed exchange rates and foreign exchange reserves in Turkey using nonlinear and frequency domain causality approach during the period from January 2003 until January 2014. Their findings reveal that there is a nonlinear cointegration between analysed variable and that causality is running from nominal and real exchange rate to foreign exchange reserves. Kasman and Ayhan (2008) have examined the association between exchange rates and foreign exchange reserves in Turkey, on the basis of monthly data during the period from January 1982 until November 2005 using unit root and cointegration tests, which allow for structural breaks. Their results reveal the existence of a long-run relationship between foreign exchange reserves and exchange rates and that the both long and short-run causality is running from foreign exchange reserves to real effective exchange rate. Concerning the relationship between nominal exchange rate and foreign exchange reserves, the results indicate that in the long-run nominal exchange rate Granger cause foreign exchange reserves.

Regarding methodology used in the studies related to the exchange rate relation to some other variables, few studies took into account possible structural break during the period of the analysis (Dropsy, 1996; Baum et al., 1999; Granger et al. 2000; Kočenda, 2005; Akinboade & Makina, 2006; Rapach & Strauss, 2008; Byrne & Nagayasu, 2010; Chowdhury, 2012; You & Sarantis, 2012; Mensi et al., 2015; Ahmad & Aworinde, 2016; Ojede & Lam, 2017; Salisu et al., 2019). Failure to consider a possible structural break can lead to inadequate conclusions and, consequently, to the wrong recommendations. Therefore, in this paper the tests that take into account possible structural break will be applied to assess interdependence between foreign exchange reserves and exchange rate. We expect that the results will indicate that there is causality between the analysed variables, directed from the foreign exchange reserves towards the exchange rate.

For that purpose, the following hypotheses were developed:

H1: There is no long-run relationship between the real exchange rate and foreign exchange reserves;

H2: There is no long-run relationship between the nominal exchange rate and foreign exchange reserves;

H3: There is no short-run relationship between the real exchange rate and foreign exchange reserves;

H4: There is no short-run relationship between the nominal exchange rate and foreign exchange reserves.

3. METHODOLOGY

In order to examine the existence and nature of the relationship between the exchange rate and the foreign exchange reserves, a three-step methodology proposed by Kasman and Ayhan (2008) will be applied. In the first step, using the Zivot-Andrews unit root test the level of integration of time series in situations where there is an indefinite structural breakdown will be examined. The second step of the analysis is dedicated to examining the existence of cointegration in a situation where there is an unsteadiness in long-term relations using Gregory and Hansen cointegration test. In the final step, causality is tested using a Granger causality test.

3.1. Unit root test

The traditional unit root tests, such as ADF unit root test, may lead to invalid conclusions in situations where there is a structural break. Such assumptions are firstly stated by Perron (1989). He has created a unit root test which takes into the consideration possibility of a single external structural break (Umit, 2016). Yet, the flaw of the proposed test is that it requires the moment of structural break to be predefined and in situations where that moment is not accurately determined, the wrong results may occur. Bearing in mind the shortcomings of the Perron's test, Zivot and Andrews (1992) have developed a test that takes into account the existence of a single structural break which can be designated internally. The Zivot and Andrews test detects endogenously the moment of the particular most important structural break in each time series tested (Waheed et al. 2006). The critical values in Zivot and Andrews test diverge from the ones provided by Perron (Glynn et al. 2007). The null hypothesis of a unit root with a break is rejected if the computed *t* statistics exceed the critical values of Zivot and Andrews test in absolute terms. There are three models of Zivot and Andrews test (Waheed et al. 2006):

- model A: allows a one-time shift in the series level;
- model B: allows for a one-time shift in the slope of the trend function;
- model C: represents a combination of previous models.

3.2. Cointegration tests

Economic time series most often has a stochastic trend, that is, it moves unpredictably over time. The term of cointegration relates to non-stationary time series, among which there is such a linear combination that is stationary (Kovačić, 1995). In other words, the term cointegration indicates the stationarity of a linear combination of separately non-stationary time series. From an economic point of view, two time series will be cointegrated if there is a long-term equilibrium relationship between them. Cointegration was first investigated in works by Granger (1983), Granger and Weiss (1983) and Engle and Granger (1987). These works provide an adequate basis for analysing long-term and short-term economic relationships.

The conventional cointegration test examines the null hypothesis of no cointegration through examining the null of a unit root in the residuals, and if the null of a unit root is not accepted, the null of no cointegration is also not accepted (Phillips & Ouliaris, 1990). However, most of the conventional cointegration tests, such as Engle and Granger test and Johansen test, do not consider the possibility of structural breaks in the long-run relationship,

meaning that such test presumes that the cointegrating vectors do not fluctuate over time (Ndoricimpa, 2013). In order to address these shortcomings of conventional tests, Gregory and Hansen (1996) have developed cointegration test that takes into account the possibility of a single structural break that can be considered as an extension of the Engle and Granger two-step test (Liu & Wan, 2012). Gregory and Hansen (1996) propose four different models in order to account for the single endogenous break (Ndoricimpa, 2013):

- Model 1: Level shift – the structural break influences only on the intercept;
- Model 2: Level shift with trend – the structural break influences only the intercept but the model encompasses a trend.
- Model 3: Regime shift – the structural break influences the intercept and the slope coefficient, jointly.
- Model 4: Regime shift with trend – the structural break influences the intercept, the slope coefficient and the trend function.

3.3. Causality test

The presence of cointegration shows the existence of a long-run relationship between variables. On the other hand, the absence of the cointegration between two time series in the long run, does not mean that there is no short-run causal interrelationship (Lodha, 2017). Short-run interrelationship can be inspected by performing the Granger causality test.

In the literature, one can find the definition of Granger's causality stating that X causes Y in Granger's sense if the present value of the variable Y can be predicted with greater accuracy using the past values of the variable X, and not only the past values of the variable Y, with other conditions unchanged (Watson & Teelucksingh, 2002).

Granger causality test was originally developed to identify the impact of one time series on the other. Granger causality test is based on two basic principles (Granger, 1969):

- The cause occurs before the effect;
- Cause creates unique changes to the effect, that is, the causal series contains unique information about the time series which it affects, which are not available otherwise.

The causality test application is determined by the fact whether there is cointegration between variables or not (Kasman & Ayhan, 2008). If there is a cointegration then a Vector Error Correction model (VECM) should be applied to determine the long and the short-run relationship between variables, and if there is no cointegration, the Vector Autoregression model (VAR) should be used.

4. DATA AND ANALYSIS

The time series data for the nominal exchange rate and foreign exchange reserves for the period from September 2005 until April 2019 were collected from the National Bank of Serbia database in order to examine the existence and nature of the relationship between the exchange rate (nominal and real) and foreign exchange reserves. The real exchange rate is obtained using the equation:

$$RER = NER * \frac{P_{EU}}{P_{SER}}, \tag{1}$$

where NER signifies the nominal exchange rate, P_{EU} and P_{SER} symbolize consumer price indexes in the EU and Serbia, respectively.

The first step in the analysis is to test the stationary of time series and to determine the order of integration in the case of nonstationary series. For that purpose, the augmented Dickey–Fuller unit root test (ADF) has been applied and the results are presented in the Table 1. According to the obtained value of test statistics it can be determined that all analysed time series are not level stationary. On the other hand, their first differences are stationary.

Table 1 Calculated ADF statistics

	Nominal exchange rate		Real exchange rate		Foreign exchange reserves	
	no trend	trend	no trend	trend	no trend	trend
level	-1.538	-1.337	-3.104	-3.117	-2.864	-3.355
first difference	-13.496	-13.607	-12.908	-12.865	-11.330	-11.312

Source: Authors' calculation

Note: Optimal number of lags revealed based on AIC; Critical values are (MacKinnon, 1991): -3.493 (99%) and -4.023 (99%) with no trend and with trend, in that order

However, the existence of structural break reduces the power of the ADF test (Kasman & Ayhan, 2008). Therefore, to detect potential structural break the Zivot and Andrews test has been applied and the obtained results are presented in Table 2. The results endorse results obtained by ADF test. Hence, all time series are I (1).

One of the research assumptions is that the periods of the identified structural break will coincide with the periods of the financial and economic crises in the Republic of Serbia. Since the third model which includes both, the single shift in the intercept and the trend, is the most restrictive, this model is tested first, and if there the null is rejected, then other two models are tested. The results of the Zivot-Andrews unit root test indicate that nominal exchange rate, real exchange rate and foreign exchange reserves show that the estimated break occurred in the February 2012, December 2008 and May 2009, respectively, which is consistent with the stated assumption. This is also consistent with the assumption that the structural breaks occur due to political or economic factors related to the specific country.

Table 2 Zivot-Andrews unit root test

	Nominal exchange rate	Real exchange rate	Foreign exchange reserves
Break point	2012m2	2008m12	2009m5
Minimum t-statistic	-4.150	-4.639	-4.768
lags	3	3	3

Source: Authors' calculation

Note: Optimal number of lags obtained based on AIC;
Critical values are: 1%: -5.57, 5%: -5.08, 10%: -4.82

The structural breaks detected in the December 2008 and May 2009 were caused by instability due to the effects of the global economic and financial crisis. Firstly, the negative effects of the crisis were transferred from abroad which has resulted in the occurrence of deflation, leading to an increase in the real exchange rate. Secondly, after several months

the recovery started in terms of transferring positive effects from abroad, which improved the current account balance and suddenly increased foreign exchange reserves. The structural break in February 2012 had a different character and was caused by internal economic problems (first of all, inflation).

Since the unit root test have revealed that all analysed time series are *I* (1), it is necessary to perform further analysis in terms of cointegration testing. The cointegration testing will be conducted in two steps. In the first step conventional Engle-Granger cointegration test (Engle & Granger, 1987) will be applied which does not take into account structural break. The obtained results are presented in Table 3 and indicate that the null hypothesis of no cointegration cannot be rejected at the 1% level. Therefore, analysed time series in all models are not cointegrated.

Table 3 Engle–Granger cointegration test

Models	ADF	Lags
$FER=\alpha+\beta NER+\varepsilon$	-3.963	3
$NER=\alpha+\beta FER+\varepsilon$	-3.383	3
$FER=\alpha+\beta RER+\varepsilon$	-2.206	3
$RER=\alpha+\beta FER+\varepsilon$	-3.745	3

Source: Authors' calculation
Note: Critical values are: -3.970 (99%), -3.377 (95%), -3.073 (90%)

Kasman and Ayhan (2008) state that in the situation when conventional cointegration tests fail to reject the null hypothesis of no cointegration and Gregory-Hansen procedure rejects the null, it indicates the presence of the structural shift in the long-run co-movements between analysed time series. Therefore, in the second step, a Gregory-Hansen test was applied in order to consider possible structural shift during examination of the cointegration existence (Gregory & Hansen, 1996). The results are presented in the Table 4.

First panel examines the relationship between foreign exchange reserves and nominal exchange rate, where foreign exchange reserves represent dependent variable. The first and the second model detect the presence of cointegration, which is not discovered by the conventional cointegration test. Second panel investigates the relationship between nominal exchange rate and foreign exchange reserves, where the nominal exchange rate is the dependent variable. The test results of the model that allows for regime switch do not support the results obtained by conventional cointegration test of no cointegration. Therefore, there is a long-run relationship between nominal exchange rate and foreign exchange reserves. Third panel inspects the association between foreign exchange reserves and real exchange rate, where foreign exchange reserves represent dependent variable. The results indicate the existence of a long-run relationship between analysed variables. Fourth panel inspects the association between the real exchange rate and foreign exchange reserves, where the real exchange rate is the dependent variable. The results for all models support the results obtained by the conventional cointegration test of no cointegration.

Table 4 Gregory-Hansen cointegration test

Models	ADF	BP	Z_t	BP	Z_α	BP	Lags
Panel A: FER=α+βNER+ε							
level	-4.50***	2010m3	-4.89**	2009m9	-36.38***	2009m9	3
trend	-5.17**	2009m8	-5.56*	2009m9	-44.55***	2009m9	3
regime	-4.71***	2014m2	-4.95***	2009m8	-37.68	2009m8	3
regime trend	-4.95	2009m8	-5.25	2009m9	-44.13	2009m9	0
Panel B: NER=α+βFER+ε							
level	-4.24	2012m11	-3.32	2012m9	-17.65	2012m9	3
trend	-3.86	2009m8	-3.85	2009m8	-27.74	2009m8	0
regime	-4.82***	2014m1	-4.71***	2014m3	-23.64	2014m3	3
regime trend	-4.21	2017m1	-3.89	2009m9	-28.18	2009m9	3
Panel C: FER=α+βRER+ε							
level	-5.03**	2009m8	-5.36*	2009m9	-44.02**	2009m9	0
trend	-4.98***	2009m8	-5.34**	2009m9	-43.44***	2009m9	0
regime	-5.04**	2009m8	-5.31**	2009m9	-44.71***	2009m9	0
regime trend	-4.93	2009m8	-5.15	2009m8	42.99	2009m8	0
Panel D: RER=α+βFER+ε							
level	-4.43	2009m6	-3.93	2009m8	-28.23	2009m8	3
trend	-4.88	2009m6	-4.31	2009m8	-33.17	2009m8	3
regime	-4.30	2017m5	-3.89	2009m8	-28.03	2009m8	3
regime trend	-4.97	2009m2	-4.39	2008m12	-34.66	2008m12	3

Source: Authors' calculation

Note: *, ** and *** indicate significance at 1%, 5% and 10%, in that order

The Gregory-Hansen cointegration test results disclose that different model assumptions reveal different time points of structural break. Yet, most of the break points have been detected in the second half of 2009. In that period, the basic macroeconomic indicators specify the recovery of the Republic of Serbia from the global economic crisis and transition into a state of macroeconomic stability. Hence, it may be considered that the recovery from the global economic crisis made the long-term mechanism between Serbian foreign exchange reserves and exchange rates fundamentally change.

In order to determine the causality in the presence of cointegration, it is necessary to apply VECM, which encompasses an error correction term in order to describe the short-run deviancies of series from their long-run equilibrium path. On the other hand, when cointegration is not present a VAR model can be applied in order to determine Granger causality between variables.

Moreover, there is a need to identify the number of lags to be included in the model, with the aim of adjusting to the VECM model. Lütkepohl (2005) states that Hannan–Quinn information criterion (HQIC) and Schwarz's Bayesian information criterion (SBIC) give consistent estimations of the true lag length, compared to final prediction error (FPE) and Akaike's information criterion (AIC) which overestimate the true lag length in the infinite sample. However, there is no notation what can be considered as a finite sample, therefore, since most of the studies apply AIC in the optimal lag selection, the authors will utilize that information criterion in the further course of the analysis.

For the model that examines the relationship between foreign exchange reserves and nominal exchange rate, where foreign exchange reserves represent dependant variable, the results of VECM are presented in Table 5.

Table 5 Vector error-correction model: Long and short-run causality between foreign exchange reserves and nominal exchange rate

	Coef.	Std.Err.	z	P>|z|	95% Conf. Interval	
ECT_{t-1}	-.085	.037	-2.33	0.020	-.158	-.013
ΔFER_{t-1}	.076	.081	0.94	0.348	-.083	.235
ΔFER_{t-2}	-.052	.081	-0.64	0.522	-.212	.108
ΔNER_{t-1}	-.115	.122	-0.95	0.344	-.353	.123
ΔNER_{t-2}	-.442	.121	-3.65	0.000	-.680	-.205
Constant	.003	.002	1.12	0.265	-.002	.007

Source: Authors' calculation

Note: ECT_{t-1} – lagged error correction term, ΔFER_{t-1} first lagged difference of foreign exchange reserves value, ΔFER_{t-2} second lagged difference of foreign exchange reserves value, ΔNER_{t-1} first lagged difference of nominal exchange rate value, ΔNER_{t-2} second lagged difference of nominal exchange rate value

The validity of the model is confirmed by the lagged error correction term (ECT_{t-1}), since it meets two necessary conditions: it is significant and has a negative sign. Hence, in the long-run nominal exchange rate Granger-cause foreign exchange reserves. The error correction term suggests that the adjustment of foreign exchange reserves to changes in the nominal exchange rate is slow, since the value of ECT_{t-1} is relatively small (-0.085).

The short-run influence can be evaluated based on the coefficients of lagged differenced terms. It can be noticed that the value of the nominal exchange rate is significantly influenced only by the ΔNER_{t-2} variable, meaning that past values of nominal exchange rate (two month prior the estimation) have statistically significant influence on the current value of nominal exchange rate.

Regarding the model that examines the relationship between the nominal exchange rate and foreign exchange reserves, where nominal exchange rate represents dependant variable, the results of VECM are presented in Table 6. The lagged error correction term

Table 6 Vector error-correction model: Long and short-run causality between nominal exchange rate and foreign exchange reserves

	Coef.	Std.Err.	z	P>|z|	95% Conf. Interval	
ECT_{t-1}	-.0389	0.147	-2.64	0.008	-.0678	-.010
ΔNER_{t-1}	-.109	.082	-1.32	0.185	-.271	.052
ΔNER_{t-2}	.084	.082	1.02	0.308	-.077	.245
ΔFER_{t-1}	-.055	.055	-1.00	0.316	-.163	.053
ΔFER_{t-2}	.021	.055	0.38	0.703	-.087	.129
Constant	.004	.002	2.13	0.033	.0003	.007

Source: Authors' calculation

Note: ECT_{t-1} – lagged error correction term, ΔFER_{t-1} first lagged difference of foreign exchange reserves value, ΔFER_{t-2} second lagged difference of foreign exchange reserves value, ΔNER_{t-1} first lagged difference of nominal exchange rate value, ΔNER_{t-2} second lagged difference of nominal exchange rate value

in this model is significant at the 1% level with a negative sign, signifying that in the long-run, foreign exchange reserves Granger-cause the nominal exchange rate. However, since the value of the error correction term is rather small (−0.0389), the adjustment of nominal exchange rate to the changes in foreign exchange reserves is relatively slow.

Based on the values of the lagged differenced terms, it can be concluded that there is no statistically significant influence of past values of nominal exchange rate nor foreign exchange reserves on the current value of the nominal exchange rate.

Concerning the model which examines the long-run relationship between foreign exchange reserves (as dependant variable) and the real exchange rate, the error correction term is negative -0.0002634, but statistically insignificant (p value is 0.952), meaning that there is no long-run relationship between variables in this model. Therefore, their short-run relation will be examined using a Granger causality test. Also, since the cointegration tests have not discovered cointegration between the real exchange rate (as a dependant) and foreign exchange reserves, their short-run relation will also be tested using a Granger causality test.

Table 7 Granger causality test

Dependent variable	Independent variable	
	ΔFER	ΔRER
ΔRER	1.1523	
	(0.3188)	
ΔFER		4.5834
		(0.0118)

Source: Authors' calculation
Note: p-value in parenthesis

The F-statistics indicates that there is a short-run causality running from real exchange rate towards foreign exchange reserves. On the other hand, foreign exchange reserves do not Granger-cause real exchange rate.

Therefore, concerning the relationship between foreign exchange reserves and the real exchange rate, there is no long-run interdependence, and first hypothesis cannot be rejected. Regarding their short-run dynamics, the Granger-causality test has detected causality in one direction, from real exchange rate towards foreign exchange reserves. Hence, the third hypothesis is rejected.

Relating to the relationship between foreign exchange reserves and nominal exchange rate there is evidence of long-run interdependence, meaning that the second hypothesis is rejected. However, the values of the coefficients of lagged differenced terms indicate that there is no short-run causality between these variables. Hence, the fourth hypothesis cannot be rejected.

Despite expectations, based on the previous literature review, that exchange rate fluctuations are caused by the movement of foreign exchange reserves, the results indicate that, in the case of the Republic of Serbia, there is no causality in this direction, but rather there is a causality directed from the exchange rate (real exchange rate in short-term and nominal exchange rate in the long-term) to foreign exchange reserves. As there is a significant long-term relationship between foreign exchange reserves and the nominal exchange rate, the accumulation of foreign exchange reserves is more than

necessary to mitigate the negative effects of future crises on the exchange rate and for the sustainability of the managed exchange rate regime. The stockpiling of foreign exchange reserves may also reflect the aspirations to improve Serbia's credit rating in order to attract foreign direct investment and portfolio investments.

Low inflation, which is a long standing result of the implementation of the inflation targeting strategy, as well as the improvement of the economic and fiscal situation, are domestic factors that, on the other hand, will enable a stable exchange rate and preserve an adequate level of foreign exchange reserves in the event of potential external shocks, thereby increasing resilience to future currency crisis.

5. CONCLUSION

The aim of this paper was to provide a comprehensive analysis of the co-movement between the exchange rates (real and nominal) and foreign exchange reserves. Most of the conventional cointegration approaches disregard the possibility of structural break, which could result in mistaken conclusion. Therefore, the research methodology took into account the possible structural break, in order to avoid biased results.

The paper focused on the long and the short-run relationship between exchange rate and foreign exchange reserves. The results revealed that all analyzed variables were non-stationary at level, but stationary at first difference, and that there was a single structural break in the series, which coincides with the periods of financial and economic crises in the Republic of Serbia. Conventional cointegration test (Engle-Granger test) have not detected cointegration between analyzed variables. However, Gregory-Hansen test, which allows for a single shift in the series, has detected the existence of cointegration. The causality tests have proven the existence of a long-run interdependence between foreign exchange reserves and nominal exchange rate. Conversely, there was no evidence of long-run interdependence between foreign exchange reserves and the real exchange rate. Yet, the results of Granger-causality test indicated that there was unidirectional short-run causality, from real exchange rate towards foreign exchange reserves. This causality indicates that the prediction of the future values of foreign exchange reserves would be better if the past values of real exchange rate are also considered.

This paper contributes to the literature on the interdependence between exchange rates and foreign exchange reserves in the developing countries, on an example of the Republic of Serbia. However, the research faces some limitations. The first limitation concerns the methodology applied. The results of the analysis are affected by the applied lag length, and since there are various methods for determination of the lag length, it is possible that the application of different information criterion would indicate different lag length which could result in different conclusions. The second limitation concerns the scope of the study, since there may be some other macroeconomic variables whose influence was not taken into consideration.

In order to respond to these limitations, research can be extended in various directions. Firstly, some new macroeconomic variables can be introduced into the analysis. Secondly, it is possible to examine the impact of lag length determined by different information criteria on the obtained results.

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UZROČNOST IZMEĐU DEVIZNIH KURSEVA I DEVIZNIH REZERVI: PRIMER SRBIJE

Cilj ovog rada jeste utvrđivanje odnosa između deviznog kursa (nominalnog i realnog) i deviznih rezervi na osnovu mesečnih podataka za period od septembra 2006 do aprila 2019. godine, primenom testova jediničnog korena i testova kointegracije koji uzimaju u obzir mogućnost postojanja strukturnog loma. Rezultati testa uzročnosti ukazuju da postoji dugoročna veza između nominalnog deviznog kursa i deviznih rezervi. Sa druge strane, nije utvrđeno postojanje dugoročne veze između realnog deviznog kursa i deviznih rezervi, ali da postoji kratkoročna uzročnost, odnosno da realni devizni kurs Granger-uzrokuje devizne rezerve.

Ključne reči: *devizni kurs, devizne rezerve, testovi jediničnog korena, testovi kointegracije, Granger uzročnost, vektorski model sa korekcijom greške*

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