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Transition in Serbia started more than a quarter of a century ago, too long from the perspective of the world we are living in today. Unfortunately, Serbia's transition achievements such as the enhancement of the private sector, encouragement of entrepreneurship, boost of competition, competitiveness increase, leading-edge technology implementation, efficient and ethical corporate governance and better integration in the global supply chain are in contradiction with the expectations that were set at the begging of the process and far below the achievements of other CEE countries. This edition of *Ekonomika preduzeća* is an odyssey toward a creation of a new economic policy framework in Serbia that would instigate a more dynamic growth and pave the way for development toward a modern and sustainable economy. Industrial policies are at the core of the proposed framework. However, understanding the key macroeconomic vulnerabilities and structural imbalances is a prerequisite for molding proper and effective industrial policy.

In the light of previous remarks, the *Introductory Paper* written by one of the most prominent authors in the field of econometric analysis of macroeconomic fundamentals in Serbia, *Z. Mladenović*, analyzes the empirical relevance of the unemployment hysteresis hypothesis in CEE countries over the 2004–2015 period. The results obtained could be very useful in solving the key structural imbalance in Serbia.

The first paper in the *Organization and Management* section written by *J. Žarković, D. Mijačić, and B. Paunović*, presents the key findings of a research on Roma entrepreneurship in the context of the overall entrepreneurial population in Serbia and the general characteristics of ethnic minority entrepreneurship in the world. The authors provide analysis of the key obstacles, as well as well-structured suggestions for developing Roma entrepreneurship in Serbia.

In the second paper in this section, *J. Filipović* analyzes the entrepreneurial, as well as R&D appetite among the population of educated youngsters in Serbia. AIDA model for connecting the entrepreneurs, students and professors, serving as an online marketplace for research projects, attracted significant attention and interest regarding its use. The author discusses possible measures for achieving greater results and provides recommendations accordingly.

In the *Finance* section, a trio *D. Malinić, V. Milićević* and *M. Glišić* deals with the quality of financial reporting in Serbia. The authors call attention to the importance of high-quality financial reporting, not only in the accounting profession, but primarily for ensuring greater certainty for investors, efficient functioning of capital markets and the prosperity of national economies. They identify key pillars of financial reporting infrastructure which are essential for achieving the required level of quality. They also point to the roles and responsibilities that different participants in the chain of financial reporting assume in the development of high-quality legal and professional regulations. Finally, they demonstrate the inefficiency of certain legal solutions based on the results of empirical research on the attitudes of professional accountants toward the quality of legal and professional regulations.

In the *Tax and Law* section, *J. Perović* presents an overview of the most important steps for providing efficiency in resolving business disputes. The author examines the advantages of arbitration over state courts, provides readers with drafting considerations for arbitration agreement, analyzes the procedure for selection and appointment of arbitrators, suggests tools and techniques for effective case management and explores the advantages and potential risks of fast track arbitration.

The first paper in the *Transition and Restructuring* section, written by *G. Kokeza* and *D. Radosavljević*, examines the influence of technological development on the enhancement of the innovativeness in domestic industrial enterprises. The authors analyze the significance and complexity of the influence of technological development, as one of the key levers of economic growth, on contemporary business conditions and innovativeness in domestic industrial enterprises. Finally, they propose certain actions that should be taken so as to improve the existing unfavorable situation in this field.

The second paper in this section, by *Ž. Kleut* and *J. Birovljev*, defines a model of sustainable agriculture, observed through different dimensions of sustainability, with the support of multivariate analyses. The authors also determine the level of development of agriculture in Serbia in comparison to the EU countries in the light of necessary alignment of agrarian policies of Serbia and the EU.

In the last paper, *K. Radosavljević* analyzes the efficiency of resource utilization in small family farms. The author demonstrates that business activities are highly dependent on natural factors, the production process is mainly labor-intensive, while investments in fixed assets are frequently hindered by difficulties in securing finance. She also provides financial analysis of the effectiveness of investments made in agriculture in Serbia, based on the raspberry case.

Prof. Dragan Đuričin, Editor in Chief

A handwritten signature in black ink, appearing to read 'Dragan Đuričin', written in a cursive style.

Zorica Mladenović

University of Belgrade
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ECONOMETRIC TESTING OF UNEMPLOYMENT HYSTERESIS IN SELECTED CEE COUNTRIES: LESSONS FOR THE SERBIAN ECONOMY

Ekonometrijsko testiranje hipoteze o efektu
histerezisa u stopi nezaposlenosti izabranih zemalja
Centralne i Istočne Evrope – pouke za privredu Srbije

Abstract

The paper investigates the empirical relevance of the unemployment hysteresis hypothesis in the following CEE countries: Bulgaria, Croatia, Romania, Hungary and Slovenia. Monthly time series are considered over the 2004-2015 period.

The econometric analysis is based on several techniques. Apart from employing conventional unit root tests, the Fourier ADF test is computed to capture non-linear pattern of the deterministic component, and the Lee-Strazicich test to control for up to two endogenously determined structural breaks. These two tests are also used in the two-step approach to increase testing efficiency. Finally, to allow for more flexible treatment of the unemployment rate dynamics, the ARFIMA models are estimated.

The unit root presence was clearly detected in Hungary and Slovenia, supporting the empirical validity of the unemployment hysteresis hypothesis and suggesting that random shocks have permanent impact on the evolution of unemployment rates. The unit root is rejected in the unemployment rates of Bulgaria, Croatia and Romania, but their trend components were under the long-lasting influence of great shocks. Impulse responses of these variables are more persistent than in purely stationary cases.

Results for the analyzed CEE countries which have been part of the EU for a longer time indicate the necessity of implementing demand-side policies in order to reduce unemployment. New EU members in the same region may achieve satisfactory results in lowering their unemployment rates by combining supply-side and demand-side measures. Given the similar institutional background of the Serbian economy, we would expect that our results might be useful in considering the issue of reducing the unemployment rate in Serbia.

Keywords: *unemployment rate, unit root, non-linear trend, structural break, ARFIMA.*

Sažetak

U radu su izloženi rezultati testiranja empirijske relevantnosti hipoteze o efektu histerezisa u nezaposlenosti za sledeće zemlje Centralne i Istočne Evrope: Bugarska, Hrvatska, Rumunija, Mađarska i Slovenija. Mesečne vremenske serije su korišćene u periodu: 2004-2015.

Ekonometrijsku analizu čini nekoliko procedura. Pored primene standardnih testova jediničnog korena, određene su i vrednosti Furijeovog ADF testa, kojim se obuhvataju nelinearne promene determinističkog trenda, kao i vrednosti Li-Stražičićevog testa, kojim se na endogeni način inkorporira postojanje do dva strukturna loma. Ova dva testa smo obuhvatili i dvofaznom procedurom u cilju povećanja efikasnosti testiranja. Na kraju, dinamiku stope nezaposlenosti modelirali smo na osnovu ARFIMA specifikacije, koja pruža veći stepen fleksibilnosti od testova jediničnog korena.

Utvrđeno je postojanje jediničnog korena u stopama nezaposlenosti mađarske i slovenačke ekonomije. Time se sugerše trajan uticaj slučajnih šokova na kretanje stopa nezaposlenosti, odnosno empirijska valjanost hipoteze o histerezi u Mađarskoj i Sloveniji. Nismo ustanovili prisustvo jediničnog korena u stopama nezaposlenosti Bugarske, Hrvatske i Rumunije. Međutim, sistemska komponenta trenda je pod trajnim uticajem snažnih šokova. Ove vremenske serije ipak ispoljavaju veći stepen perzistentnosti od čisto stacionarnih veličina.

Dobijeni rezultati ukazuju na neophodnost primene mera ekonomske politike na strani tražnje kako bi se redukovala nezaposlenost u razmatranim zemljama Centralne i Istočne Evrope koje su ranije ušle u EU. Kombinacija mera na strani ponude i tražnje može biti uspešna u snižavanju stope nezaposlenosti u ekonomijama novih članica EU iz istog regiona. Imajući u vidu sličan institucionalni okvir srpske ekonomije, izloženi rezultati mogu biti od koristi u sagledavanju mera za smanjenje stope nezaposlenosti u Srbiji.

Ključne reči: *stopa nezaposlenosti, jedinični koren, nelinearni trend, strukturni lom, ARFIMA.*

Introduction

Dynamics of the unemployment rate has been an extensively discussed topic in macroeconomics due to its crucial influence on key macroeconomic variables. Additionally, in economic theory, there is no unique opinion on the path and evolution of the unemployment rate. Two fundamental theories of unemployment are: the theory of unemployment hysteresis and the natural rate of unemployment theory.

The Blanchard-Summers [2], [1] theory of unemployment hysteresis implies that, in the long run, the unemployment rate depends on the past trends of the actual unemployment rate. Therefore, influences of unexpected random shocks on unemployment produce long-lasting effects on its equilibrium level. The Friedman-Phelps [10], [21], [22] natural rate of unemployment theory is based on the assumption that, in the long run, the unemployment rate is determined by labor market institutions and is not affected by the actual level of unemployment. It is assumed that unexpected shocks in the labor market make the actual unemployment rate different from the equilibrium level. However, this deviation is only temporary, since changes in the inflation rate caused by these shocks will induce the return of the actual level to the equilibrium level of unemployment.

Alternative unemployment theories suggest a key difference in characteristics of the unemployment rate time series. Theory of unemployment hysteresis predicts high level of persistence in this variable, so that influences of unexpected random shocks on the unemployment rate have long-lasting effects. Within time series econometric analysis, such property is commonly described by the existence of at least one unit root. Therefore, the unemployment rate should behave like a unit root process for the theory of unemployment hysteresis to be accepted as empirically valid. On the other side, the natural rate of unemployment theory implies that the unemployment rate fluctuates within the expected range around an equilibrium level, because unexpected shocks have only short-lived impacts. Such a path in time series most likely describes a stationary time series. Hence, no evidence of unit root in unemployment

rate time series would support the relevance of the natural rate of unemployment theory.

The validity of the unemployment hysteresis hypothesis was investigated for a number of countries and regions over different time intervals. Some recent works include: Gali [14], Caporale, Gil-Alana & Lovcha [3], Furuoka [11], [13] and Ghoshray & Stamatogiannis [15]. The econometric framework has been frequently based on the application of unit root tests. However, the employment of conventional unit root tests may be biased and could lead to incorrect conclusions if additional important features of unemployment rate time series are neglected. Two properties that are often detected in empirical works are: 1. non-linear deterministic trend and/or 2. the presence of structural breaks. These characteristics are not covered by competing theories on the unemployment rate, although there are some discussions of hysteresis being a non-linear phenomenon [19].

There are several reasons that make testing for unemployment hysteresis hypothesis relevant for countries in Central and Eastern Europe (CEE). Firstly, these countries underwent substantial labor market reforms that would appear partially inefficient if the unemployment rate proves to be well-described by the hysteresis hypothesis. Secondly, different responses of unemployment rates across countries in the EU to the common negative structural shock may indicate migration activity toward Western Europe if the unemployment persistence is higher in the CEE region. Thirdly, in respect of the recent economic crisis in Europe, the validity of the hysteresis hypothesis would support the implementation of policies that are designed to increase aggregate demand in order to reduce unemployment at least for a short period of time.

Empirical studies on the hysteresis hypothesis were mainly performed for the developed economies. Unemployment rates in European emerging economies were not often considered. Existing results shall now be briefly summarized. Leon-Ledesma & McAdam [17] have quantified the degree of persistence in 12 countries in Central and Eastern Europe over the period of early transition: 1992-2001. For almost all the economies, the speed of adjustment was estimated to be greater than in the EU. Camarero, Carrion-i-Silvestre & Tamarit [4], [5]

investigated unemployment rates for the 1991-2003 period in nine European economies that joined the EU in 2004. Their results refuted the hysteresis hypothesis and indicated up to four structural breaks that could be explained by institutional changes due to the implementation of market-oriented reforms. Cuestas & Ordóñez [6] examined the unemployment rates of eight emerging European economies over the 1998-2007 period. In five countries, unemployment was found to be a stationary process with highly persistent structural changes. Identical data set is considered in Cuestas, Gil-Alana & Staehr [7], along with the unemployment rate for the EU15. The level of persistence is estimated to be high, although it differs substantially between countries in the sample. Furuoka [12] quantified the level of unemployment persistence in Estonia across five different regions during the 1993-2011 period. The hysteresis hypothesis was not empirically supported. Mladenović & Anić [18] evaluated the persistence of the unemployment rate in 10 countries that joined the EU in 2004 by employing data from the 2004-2015 period. The results were benchmarked against the EU15. The estimated persistence in three cases was of greater magnitude than in the EU15. The findings suggested that the dynamics of unemployment rates were characterized by different patterns, indicating that country-specific measures of economic and employment policies should be implemented.

Econometric investigation of all the reviewed papers includes the application of unit root tests. However, different versions of tests were employed. Ordinary univariate or/and panel unit root tests were regularly calculated. To control for one structural break or more than one structural change in time series, modified versions of unit root test were also frequently employed. Tests that account for smooth non-linearity or fractionally integrated alternatives were implemented once. Apart from unit root testing, explicit modelling of unemployment rate dynamics was performed in some papers. Linear autoregressive and autoregressive fractionally integrated moving average (ARFIMA) models were used in Cuestas, Gil-Alana & Staehr [7]. The Markov-switching autoregressive model was estimated in Leon-Ledesma & McAdam [17] and Mladenović & Anić [18]. The latter two specifications allow for flexibility in capturing adjustment of unemployment rate to random shocks,

and they frequently outperform the quality of the linear autoregressive model in describing the unemployment rate evolution over time.

The purpose of this paper is to evaluate the empirical relevance of the unemployment hysteresis hypothesis in the three countries in CEE that were the last to join the EU. These are Croatia, Bulgaria and Romania. Monthly time series are considered over the January 2004 – July 2015 period. These unemployment rates have been mostly neglected in the existing empirical literature on hysteresis. Additionally, data for Hungary and Slovenia are included on the account of these being countries from the same region, but which acceded to the EU during an earlier period, in 2004. According to the findings in Mladenović & Anić [18], the unemployment persistence in Hungary and Slovenia is of greater magnitude than in the EU15. By reevaluating these data, we aim at examining their dynamic properties within different methodological set-ups. This enables comparison of results obtained by applying different econometrics techniques, but also a general assessment of the reliability of the econometric approach followed in this paper.

Econometric analysis in this paper is conducted in five steps. The first four steps follow the basic idea of algorithm advanced recently in Furuoka [13], which was used to analyze unemployment rates in four Nordic countries. Firstly, a set of conventional unit root tests is employed (ADF, KPSS and ERS). These tests assume the linear deterministic component of time series which cannot always be justified, especially when the data cover pre- and post-2008 period. Secondly, to test for possible non-linear behavior of the deterministic component and to obtain correct results if non-linearity is an issue, the Fourier ADF test (FADF) of Enders & Lee [8], [9] is computed. This approach is efficient in capturing unknown structural breaks or unattended non-linearity in the deterministic component. The FADF test has not been previously used on unemployment rates in the CEE region. Thirdly, an ADF test that handles up to two endogenously determined structural breaks [16] is calculated in order to control for possible abrupt changes in the level and slope of the deterministic trend component. Fourthly, steps two and three are combined in the following way: data are adjusted

for the Fourier trend approximation, after which the unit root test with structural break is performed. By doing this, two frequently dominant features of unemployment rates are simultaneously taken into account, which may improve the reliability of the testing procedure. Finally, step five represents robustness check of the empirical findings based on the estimation of the fractionally integrated parameter. By estimating the ARFIMA models of annual changes in the unemployment rates, we evaluate the significance of the long-memory parameter, which is an alternative approach to assess the presence of hysteresis.

The rest of the paper is organized as follows. The results of using ordinary and the Fourier ADF unit root tests are presented in the following section. Testing that involves structural break presence is given in the third section, while the fourth section describes the ARFIMA modelling. The last section summarizes results and offers some conclusions.

Unit root testing: Linear and smooth non-linear trend

Monthly observations of the unemployment rates in Croatia, Bulgaria, Romania, Hungary and Slovenia are obtained from the EUROSTAT. Data are examined for the period from January 2004 to July 2015 (139 observations). Empirical results are obtained by employing RATS 8.2 and EViews 9.5.

To learn if these data are stationary or non-stationary in terms of unit root presence in the first stage of our analysis, several traditional unit root tests are calculated

and the results presented in Table 1. These clearly indicate that unemployment rates are unit root processes in all the economies. This finding would strongly support the unemployment hysteresis hypothesis. However, when we observe actual data in comparison with the deterministic linear trend assumed by these tests, it is evident that the deterministic linear trend poorly approximates the unemployment rate dynamics (Figure 1). Evolution of unemployment rates in all the countries is characterized by deterministic components with multiple changes both in the level and in the slope.

All unemployment rates, except the one in Hungary, declined sharply over the first part of the sample, from 2004 to the second half of 2008, reflecting mostly the high economic growth during the respective period. As a consequence of the 2008 economic crisis, these unemployment rates followed a strong upward trend over the following year, 2009, after which the growth decelerated in Croatia, Bulgaria and Slovenia. This shift to the downward trend was observed in the last part of the sample, although the timing and the dynamics were not unique across countries. In Romania, the upward trend from 2008 was halted in the mid-2010 and the unemployment rates have remained at approximately the same level ever since. In the case of Hungary, the rise of the unemployment rate was evident from the beginning of the sample that started earlier due to the loss of competitiveness. Upon reaching the highest value at the beginning of 2010, unemployment rates remained at a similar level until the end of 2012, after which they decreased sharply.

Table 1: Results of the conventional unit root testing

Country	Test for unit-root in	ADF	Number of lags	KPSS	ERS
Bulgaria	Level	-1.96	1	0.24	-1.21
	1 st difference	-4.34	0	0.35	-4.17
Croatia	Level	-1.76	3	0.32	-0.83
	1 st difference	-6.25	2	0.43	-4.89
Romania	Level	-2.15	12	0.22	-0.81
	1 st difference	-4.38	11	0.29	-0.41
Hungary	Level	0.01	1	0.29	-0.25
	1 st difference	-6.30	0	0.70	-6.32
Slovenia	Level	-2.07	1	0.26	-1.52
	1 st difference	-5.83	0	0.28	-5.08

Note: The model with a constant and a trend is used for unit root testing at the level of time series, while the model with a constant when testing is performed for the first difference. The 5% critical values in the model with a constant and a trend are -3.44, 0.15 and -2.99 respectively for the ADF, the KPSS and the ERS test. When only a constant is included, the 5% critical values are -2.88, 0.46 and -1.94 respectively. The number of lags refers to a number of correction elements included in the application of the ADF and the ERS test. The truncation parameter in calculating the Newey-West correction for the KPSS test is either set to 8 or 9, or it corresponds to the number of corrections in the ADF test.

Since the tests performed do not account for such changes, it is no surprise that some of them even indicate two unit roots (the KPSS test for Hungary and the ERS test for Romania), and even mild explosiveness (the ADF test with a constant and a trend takes positive value in the case of Hungary) in one case.

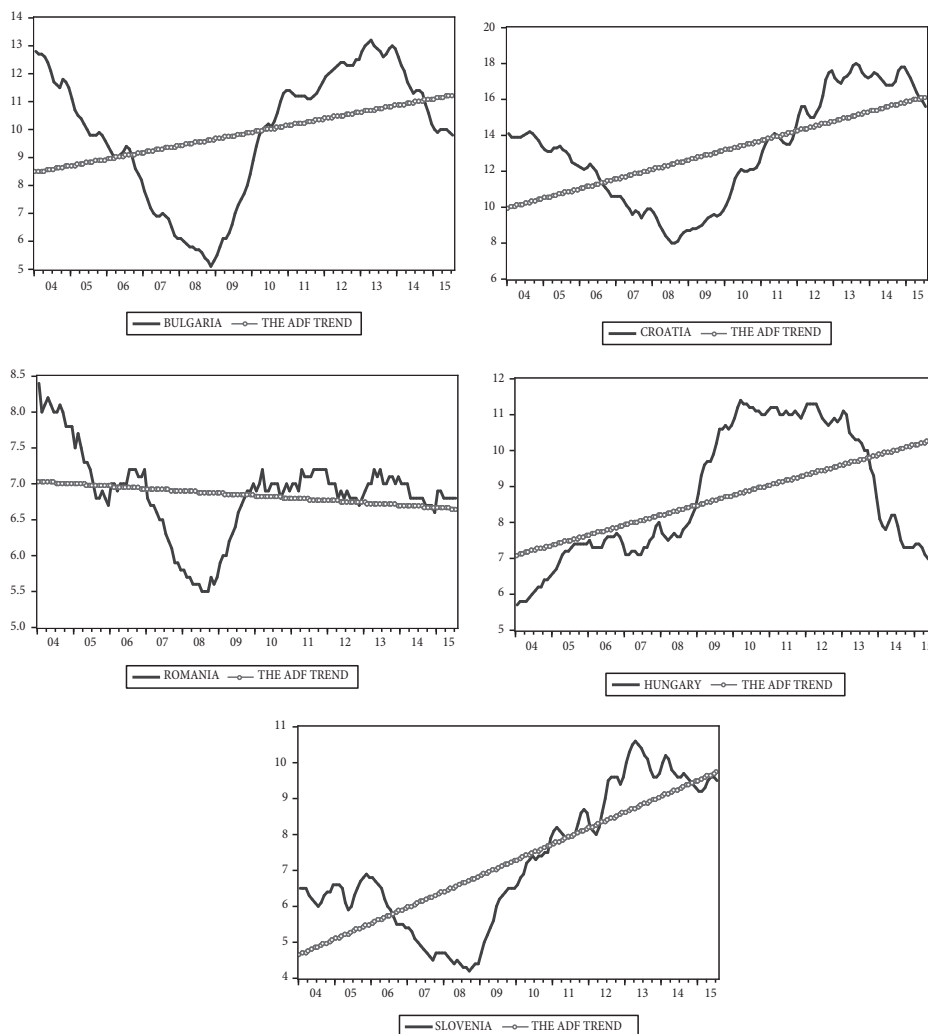
Therefore, it seems necessary to capture the deterministic component in a less restricted way so that unit root test is not derived from a possible misspecified model. Enders & Lee [8], [9] have recently developed a unit root test based on the Fourier form that is capable of capturing several smooth structural changes (the FADF test). The deterministic component is approximated by the low frequency of the Fourier expansion that enables unit root testing without an a priori definition of the exact form of the trend. Standard equation for the ADF test is enlarged by the new component that represents time

dependent function defined in the following way:

$$\alpha_0 + \sum_{k=1}^n \alpha_k \sin(2\pi kt / T) + \sum_{k=1}^n \beta_k \cos(2\pi kt / T), n \leq T/2.$$

The number of frequencies included in the approximation is denoted by n , while k represents particular frequency. T is the sample size and $\alpha_0, \alpha_1, \dots, \alpha_n, \beta_1, \dots, \beta_n$ are parameters. If $\alpha_1 = \beta_1 = \dots = \alpha_n = \beta_n = 0$, then linear time series models are adequate, implying no need for trigonometric components. However, a break or a non-linear trend will make at least one Fourier frequency relevant in the testing equation. Enders & Lee [8], [9] suggest that in the practical work, the single frequency component should be selected (k ranging from 1 to 5). Additionally, the new set-up provides framework for formal testing of whether non-linearity in the deterministic component is statistically significant. During the second phase of our analysis, the FADF test is employed in two versions (with and without the linear

Figure 1: Unemployment rates and the ADF trends



trend component), along with the formal test for non-linearity in the deterministic component.

Strong non-linearity in the deterministic component is observed in the data for Croatia and Slovenia, while unemployment rates in Bulgaria and Hungary were found to exhibit non-linear trend only at the 10% significance level. These findings question the reliability of ordinary unit root tests and justify the use of those modifications

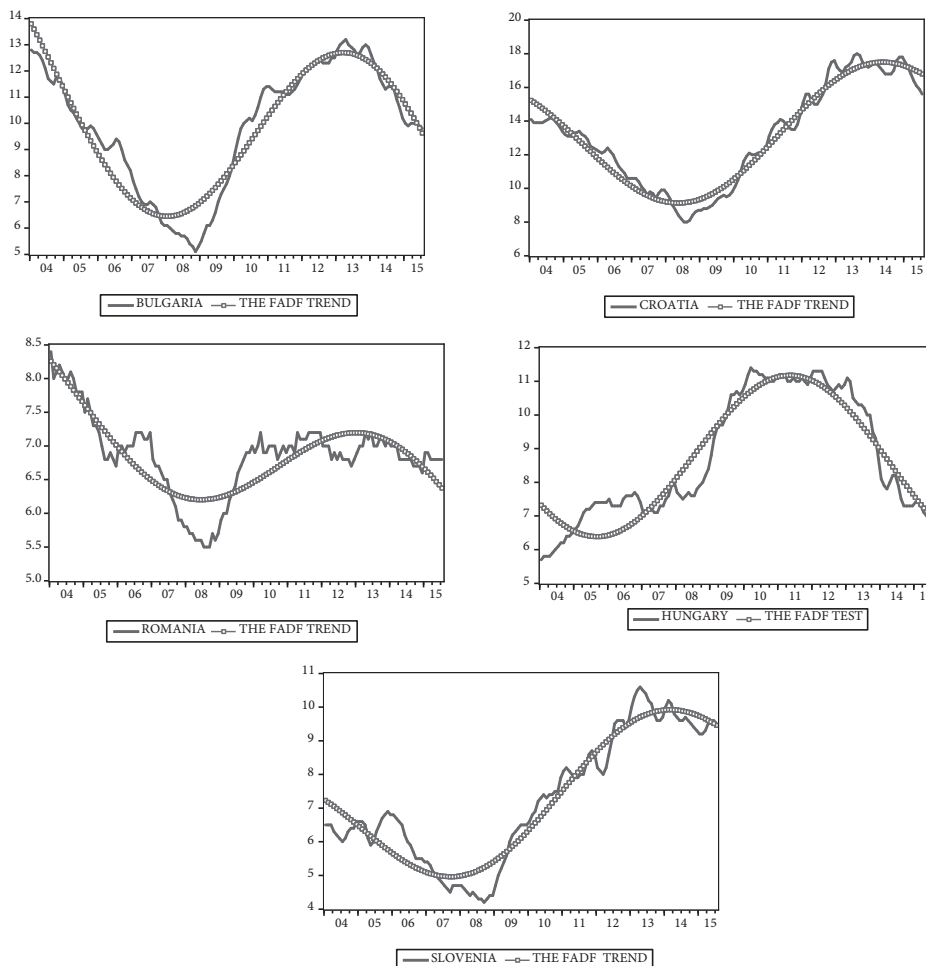
that account either for smooth or sudden changes in the deterministic component. The application of the FADF test suggests that the unemployment rate in Croatia does not contain a unit root, while it appears to be present in the rest of the sample. The unemployment rate dynamics is certainly better described by the trend component derived from the FADF approach, as evident in Figure 2. We may argue that approximation is the least successful

Table 2: Results of the FADF unit root and non-linearity testing

Country	Model	FADF	Number of lags	Non-linearity test	Non-linearity evidence
Bulgaria	With linear trend	-3.02	5	6.87*	Yes
	Without lin.trend	-1.86	5	4.43	No
Croatia	With linear trend	-4.10**	2	13.75***	Yes
	Without lin.trend	-4.28**	2	15.69***	Yes
Romania	With linear trend	-3.83	5	3.65	No
	Without lin.trend	-3.20	5	1.22	No
Hungary	With linear trend	-2.95	1	7.65	No
	Without lin.trend	-3.20	1	7.42*	Yes
Slovenia	With linear trend	-2.73	4	8.49**	Yes
	Without lin.trend	-2.87	4	9.55**	Yes

Note: ***, ** and * denote respectively the significance at 1%, 5% and 10% level. Parameter k is set to one according to the results of the algorithm advocated in Enders & Lee [8].

Figure 2: Unemployment rates and the FADF trends



for the Romanian unemployment rate, which would be in line with the reported result in Table 2 that the FADF non-linearity test is insignificant in both versions of the model only for this time series.

Unit root testing and structural breaks: Two approaches

In order to control for the non-linear behavior due to the possible structural break presence, we carried out the Lee-Strazicich (LS) unit root test [16] which assumes endogenous search for structural change. Contrary to the first generation of unit root tests with structural breaks (for example Zivot & Andrews [23] and Perron [20]), within the LS approach, breaks are incorporated by both the null and the alternative hypotheses, so that the rejection of the null hypothesis unambiguously implies stationarity [16]. Also, the LS test allows for up to two structural breaks, making it convenient given the dynamic properties of our data.

In the third step of our empirical work, we calculate the values of the LS statistics based on the model with the deterministic component characterized by changes in both intercept and slope. This is the most general set-up under this framework that eliminates erroneous specification from variable omission. Results are reported in Table 3. The hypothesis of the unit root presence in the unemployment rate is again confirmed in Slovenia and Hungary. However, it is refuted for Bulgaria, Croatia and Romania. This evidence is strong for Bulgaria (at the 5% level) and supportive for Romania and Croatia (at the 10%). Some shocks produce strong influence on these unemployment rates, causing long-lasting changes of their trend components.

Table 3: Results of the LS unit root testing

Country	Number of lags	LS	Estimated break points
Bulgaria	12	-6.62***	2006:12, 2011:9
Croatia	9	-5.04*	2008:4, 2012:12
Romania	12	-5.02*	2007:6, 2010:4
Hungary	9	-4.33	2008:8, 2012:1
Slovenia	1	-4.71	2007:10, 2013:4

Note: *** and * respectively denote the statistical significance at 1% and 10% level. Number of lags is chosen by "general to specific" approach, starting with a maximum of 12 lags.

Figure 3 displays actual unemployment rates and the linear trend with break points identified by the LS test. We may notice that this trend estimation is more precise than in the ADF model, but it leaves substantial part of the systematic component in the unemployment rates unexplained.

Finally, both the FADF and the LS approaches are implemented within the two-step procedure. Original time series are first detrended by using the approximation of the low frequency Fourier expansion. Then the LS test is conducted on series corrected for such a trend. We try to improve testing efficiency in this way by capturing at the same time two possible forms of non-linearity. In other words, the Fourier trend estimation does not account for sharp structural shifts as, on the other side, controlling only for such breaks neglects smooth changes in the trend that have been verified for most economies in our sample.

Results from the combined approach are reported in Table 4. The unemployment hysteresis hypothesis is strongly rejected for Bulgaria and Croatia, which confirms the findings of the FADF test for Croatia and the LS test for Bulgaria. The unit root is detected in the unemployment rates for Romania, Hungary and Slovenia.

Approximation of the unemployment rates movement by trends estimated within the two-step approach is presented in Figure 4. Visual inspection suggests that this approach outperforms other trend estimations carried out in this paper, except that for Romania the last two methods yield almost identical pictures. This general observation has been formally confirmed by the lowest values of the residual sum of squares being the criterion advocated in the empirical works of Furuoka [11], [13]. Two break points in each time series make the distinction between three different trend regimes.

Table 4: Results of the LS unit root testing on the FADF corrected data

Country	Number of lags	LS	Estimated break points
Bulgaria	12	-6.21***	2007:12, 2011:2
Croatia	1	-7.11***	2006:4, 2009:9
Romania	12	-4.05	2009:3, 2011:10
Hungary	9	-4.63	2007:11, 2009:10
Slovenia	1	-4.92	2007:1, 2009:8

Note: *** denotes the statistical significance at 1% level. Number of lags is chosen by "general to specific" approach, starting with a maximum of 12 lags.

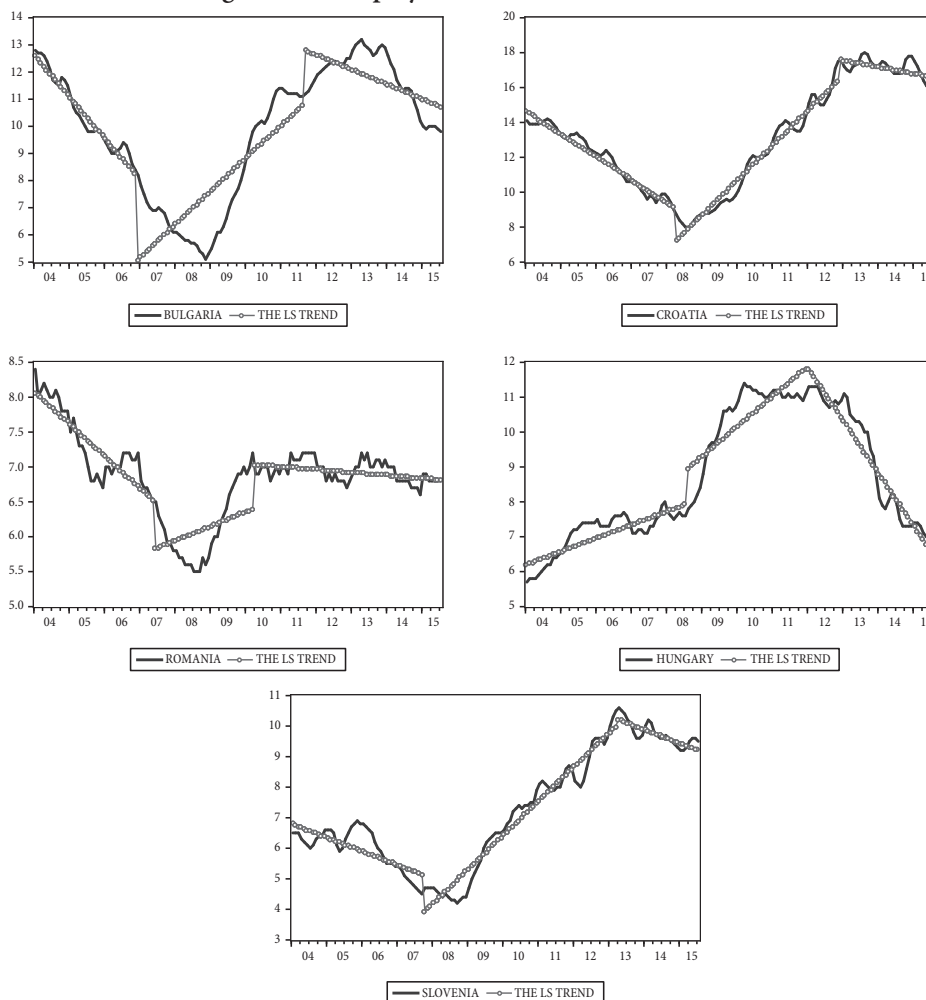
To sum up the results from four testing procedures and trend analyses, we may conclude that the unemployment hysteresis hypothesis is not empirically confirmed for Bulgaria and Croatia. These findings indicate that evolutions of the respective unemployment rates are stationary, but follow smooth non-linear trends that display structural breaks in slope and in intercept. Some shocks produce strong influence on these unemployment rates, causing long-lasting changes of their trend components. Nevertheless, short-term fluctuations are stationary. On the other side, unemployment rates in Slovenia and Hungary have a unit root according to all calculations, thus suggesting empirical validity of the unemployment hysteresis hypothesis. Both long-term movements and short-term variations of these time series are under the persistent influence of random shocks. The results are inconclusive for Romania. Only one approach implies stationarity (the LS test), but it is the framework that best captures changes in the trend component.

Robustness analysis: ARFIMA estimation

Instead of restricting our analysis to the issue of whether a series is stationary (integrated of order 0) or has a unit root (integrated of order 1), in this section we apply a more flexible methodology that allows for the possibility of fractional order of integration. Parameter of fractional integration, denoted by d , is incorporated within the ARMA set-up which gives the ARFIMA class of models. This implies that results will be derived from the explicit modelling of the unemployment rate dynamics. Depending on the value of d , we can assess how a time series reacts to the impact of unexpected random shocks which has relevant implications for the testing of hysteresis in unemployment (see, for example, [7] and [3]).

To make the fractional integration approach plausible in our data set, we use annual changes of monthly unemployment rates. Such transformation ensures more

Figure 3: Unemployment rates and the LS trends



precision in establishing the extent of random shocks persistence, because it eliminates a priori the monthly deterministic and stochastic trend component. For example, if $0 < d < 0.5$, the series is stationary, but its response to unexpected impulses resembles the reaction of a unit root process. Such time series is known as long-memory process, and parameter d as a long-memory parameter. If $0.5 \leq d < 1$, the series is no longer stationary, although it remains mean reverting (the value of d could be greater than 1, which is unlikely in our data set, since we already transformed the data by computing annual differences). Therefore, testing for empirical validity of the unemployment hysteresis hypothesis in our sample of yearly changes is based on the estimation of the ARFIMA models and on the determination of whether the parameter of fractional integration is statistically significant. Furthermore, higher estimates within the interval $[0, 1]$ would be more in favor of accepting the unemployment hysteresis hypothesis.

Additionally, we estimate models for the sample that starts in January 2008, making our research focused on the subsample characterized by the shocks from the 2008-2009 global crisis. Changes both in the technique and the data set represent robustness check of our previous findings. Results are given in Table 5.

Fractionally integrated parameter is estimated to be highly significant in the annual changes of unemployment rates in Hungary and Slovenia, with values 0.46 and 0.48 respectively. This parameter is marginally significant (at the 10% level) in the annual changes of unemployment rates in Croatia and Romania – estimates are respectively 0.50 and 0.37. Parameter of fractional integration is insignificant for the Bulgarian data. Again, long-lasting influence of random shocks in the movements of unemployment rates was detected in Hungarian and Slovenian economies. New results also confirm our finding that random shocks have only temporary impact on the Bulgarian unemployment rate.

Figure 4: Unemployment rates and the FADF-LS trends

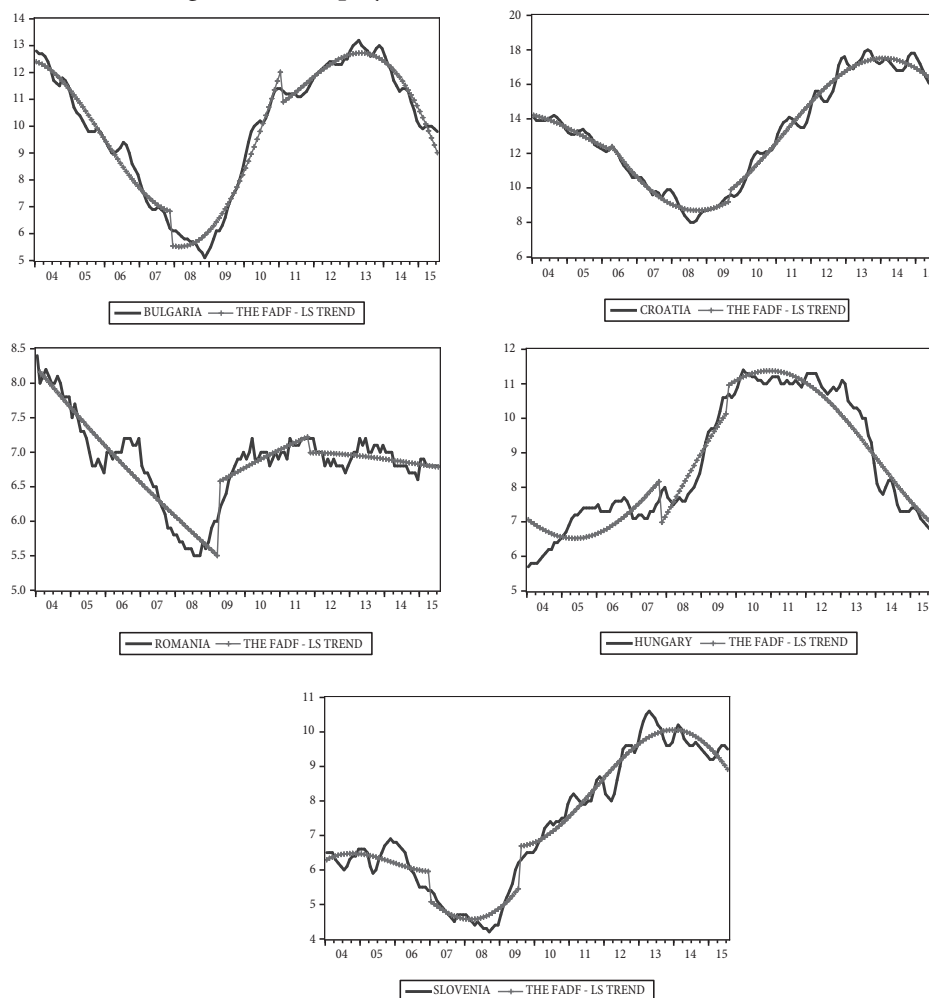


Table 5: Modelling annual changes in the unemployment rates within the ARFIMA set-up

Country	Estimate of the fractionally integrated parameter	Included AR and MA components	Specification tests
Bulgaria	0.21	AR(1,3,4,12), MA(8,12)	Q(24)=14.89(0.60), Q ² (12)=4.42(0.98), JB=1.24(0.54)
Croatia	0.50*	AR(1,2,4,6,7,12), MA(2,12)	Q(24)=9.36(0.90), Q ² (12)=13.24(0.35), JB=1.00(0.61)
Romania	0.37*	AR(1,2,3,12)	Q(24)=24.18(0.19), Q ² (12)=7.66(0.81), JB=2.47(0.29)
Hungary	0.46***	AR(1,6,12)	Q(24)=24.52(0.27), Q ² (12)=11.14(0.52), JB=4.29(0.12)
Slovenia	0.48***	AR(1,10,12), MA(1,2)	Q(24)=19.73(0.35), Q ² (12)=13.56(0.33), JB=1.47(0.48)

Note: ***, and * respectively denote the statistical significance at 1% and 10% level. AR and MA components are included if their significance was less than or equal to 10% level. The AR(12) component is multiplicative in the case of Hungary and Romania. The MA(12) component is multiplicative in the Croatian data. Q denotes the Box-Ljung statistic for testing the autocorrelation of order 24. Q² refers to the Box-Ljung statistic for testing the autocorrelation of order 12 in the squared residuals. JB denotes the Jarque-Bera normality test. Corresponding p-values are given in parentheses. Estimation is done by the method of maximum likelihood.

The application of the unit root tests revealed that the dynamics of the Croatian unemployment rate is best described by stationarity around smoothly non-linear trend and structural breaks. The examination of its annual difference in the post-2008 period indicates the relative importance of the long-memory parameter. Therefore, we may argue that the Croatian unemployment rate is stationary, but with slowly decaying responses to unexpected random shocks. Similarly, we do not have clear-cut results for the Romanian unemployment rate. Evidence of stationarity with a structural break was marginal, as was the finding that long-memory existed. These mixed results may support stationarity of the unemployment rate in Romania, but with the substantial impact of shocks described by structural breaks. Additionally, short-term variations of annual changes are, to some extent, subject to relatively important influences of unexpected shocks.

Conclusion

The paper offers results of testing the unemployment hysteresis hypothesis in the selected CEE countries by using monthly data of unemployment rates over the 2004-2015 period. Empirical assessment is derived from the unit root testing that controls for smooth non-linearity and structural breaks. ARFIMA modelling was also performed on annual changes for the 2008-2015 subsample.

Unemployment rates were found to be highly sensitive to random shocks in Hungary and Slovenia. Since the unit root presence has been accepted by all the

tests employed, the hysteresis hypothesis is confirmed in these two economies. The estimation of the long-memory parameter supports the conclusion. Our evidence differs from findings previously reported in Cuestas, Gil-Alana & Staehr [7] that covers the same economies, but over the sample ending in 2007. As we analyze the dynamics during and after the Great Recession, it could be argued that the dynamic properties of the unemployment rates in Hungary and Slovenia have changed significantly as a consequence of the 2008-2009 crisis. This was already highlighted in Mladenović & Anić [18], where similar conclusions were drawn by estimating the Markov-switching autoregressive model.

The presence of unit root in the unemployment rate is empirically rejected for Bulgaria, Croatia and Romania when taking into account the findings of those tests that capture time series evolution in the most appropriate way. As unemployment rates in these countries follow a path characterized by smooth non-linear trend and/or several structural breaks, some huge shocks are identified to have a long-lasting influence. Additionally, significance (albeit marginal) of the long-memory parameter in the latter two economies suggests that unemployment rate reacts to random shocks with more inertia than the purely stationary variables. Therefore, one should be careful in making interpretations of the unit root testing results for Croatia and Romania. The rejection of the unit root presence does not necessarily imply that the unemployment hysteresis hypothesis has no empirical content whatsoever, given the relevance of the changing deterministic trend and structural breaks.

The degree of unemployment rate persistence in Croatia and Romania is estimated to be higher than in Bulgaria, but lower than in Hungary and Slovenia. Thus, substantial heterogeneity in the unemployment rate dynamics is observed. Nevertheless, the results for the analyzed CEE countries in which have been members of the EU for a longer period of time indicate the necessity of following demand-side policies to reduce unemployment.

New EU members in the same CEE region may achieve satisfactory results in lowering their unemployment rates by combining the supply-side and demand-side measures. Given the similar institutional background of the Serbian economy, we would expect our results to shed some light on the issue of reducing unemployment rate in Serbia.

References

- Barro, R. (1988). The natural rate theory reconsidered: The persistence of unemployment. *American Economic Review*, 78, 32-37.
- Blanchard, O. J., & Summers, L. H. (1987). Hysteresis in unemployment. *European Economic Review*, 31, 288-295.
- Caporale, G. M., Gil-Alana, L. A., & Lovcha, Y. (2016). Testing unemployment theories: A multivariate long memory approach. *Journal of Applied Economics*, 19, 95-112.
- Camarero, M., Carrion-i-Silvestre, J. L., & Tamarit, C. (2005). Unemployment dynamics and NAIRU estimates for accession countries: A univariate approach. *Journal of Comparative Economics*, 33, 584-603.
- Camarero, M., Carrion-i-Silvestre, J. L., & Tamarit, C. (2008). Unemployment hysteresis in transition countries: Evidence using stationarity panel tests with breaks. *Review of Development Economics*, 12, 620-635.
- Cuestas, J. C., & Ordonez, J. (2011). Unemployment and common smooth transition trend in Central and Eastern European Countries. *Economic Issues*, 16, 39-52.
- Cuestas, J. C., Gil-Alana, L. A., & Staehr, K. (2011). A further investigation of unemployment persistence in European transition economies. *Journal of Comparative Economics*, 39, 514-532.
- Enders, W., & Lee, J. (2012a). The flexible Fourier form and the Dickey-Fuller type unit root tests. *Economics Letters*, 117, 196-199.
- Enders, W., & Lee, J. (2012b). A unit root test using a Fourier series to approximate smooth breaks. *Oxford Bulletin of Economics and Statistics*, 74, 574-599.
- Friedman, M. (1968). The role of monetary policy. *American Economic Review*, 58, 1-17.
- Furuoka, F. (2014). Are unemployment rates stationary in Asia-Pacific countries? New findings from Fourier ADF test. *Economic Research – Ekonomska istraživanja*, 27, 34-45.
- Furuoka, F. (2015). Unemployment hysteresis in the "Nordic Kitten": Evidence from five Estonian regions. *Panoeconomicus*, 62, 631-642.
- Furuoka, F. (2016). A new approach to testing unemployment hysteresis. *Empirical economics*, to be published, DOI 10.1007/s00181-016-1164-7.
- Gali, J. (2015). Hysteresis and the European unemployment problem revisited. *Barcelona GSE Working Paper Series, working paper 837*.
- Ghoshray, A. & Stamatogiannis, P. (2015). Centurial evidence of breaks in the persistence of unemployment. *Economics Letters*, 129, 74-76.
- Lee, J., & Strazicich, M. C. (2003). Minimum Lagrange multiplier unit root test with two structural breaks. *The Review of Economics and Statistics*, 85, 1082-1089.
- Leon-Ledesma, M. A., & McAdam, P. (2004). Unemployment, hysteresis and transition. *Scottish Journal of Political Economy*, 51, 377-401.
- Mladenović, Z., & Anić, A. (2016). Evaluating persistence in the unemployment rates of emerging European economies. In T. Fletcher (Ed.), *Unemployment: economic, political and social aspects* (pp. 79-96). New York: Nova Science Publishers.
- O'Shaughnessy, T. (2011). Hysteresis in unemployment. *Oxford Review of Economic Policy*, 27, 312-337.
- Perron, P. (1997). Further evidence on breaking trend functions in macroeconomic variables. *Journal of Econometrics*, 80, 355-385.
- Phelps, E. S. (1967). Phillips curve, expectations of inflation and optimal unemployment over time. *Economica*, 34, 254-281.
- Phelps, E. S. (1968). Money-wage dynamics and labor-market equilibrium. *Journal of Political Economy*, 76, 678-711.
- Zivot, E., & Andrews, D. W. K. (1992). Further evidence on the great crash, the oil price shock and the unit root hypothesis. *Journal of Business and Economic Statistics*, 10, 251-270.



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CHARACTERISTICS OF ROMA ENTREPRENEURSHIP IN SERBIA

Karakteristike romskog preduzetništva u Srbiji

Abstract

This paper presents key findings of the research on Roma entrepreneurship in the context of the overall entrepreneurial population in Serbia, and general characteristics of ethnic minority entrepreneurship in the world. The paper's objective is to show the importance of the development of Roma entrepreneurship for the solutions to economic and social problems of this ethnic group. The survey of 45 registered Roma entrepreneurs on the territory of the Republic of Serbia revealed that the majority are engaged in service provision, agriculture, manufacturing industry and waste recycling. The Roma are most often owners of microenterprises, which are usually family businesses. Roma entrepreneurs primarily operate on the local market, where revenues they generate are significantly lower than the revenues generated by other businesses. By gender, Roma entrepreneurs are mostly men. On average, they are insufficiently educated and trained to run a business, as suggested by the census data indicating that one out of three Roma people has primary education, and only 11.5% a secondary education. One of the most important problems faced by the Roma in business is obtaining finance. Another significant problem encountered by Roma entrepreneurs is related to high labour taxes and contributions, while other problems include insufficient knowledge about laws and procedures, grey economy, unstable prices of agricultural products, weak purchasing power of buyers, consumers' prejudice, etc. In order to develop Roma entrepreneurship, it is necessary to ensure a more significant financial assistance to the existing and potential Roma entrepreneurs from public and donor funds, to look into the possibility of introducing new mechanisms to finance entrepreneurial activities among the Roma, provide different types of non-financial support to Roma entrepreneurs, support associations and promote entrepreneurship.

Keywords: *Roma, entrepreneurship, ethnic minority, self-employment, family business, financing, associations, support to entrepreneurship development.*

Sažetak

U ovom radu predstavljeni su ključni nalazi istraživanja o romskom preduzetništvu u kontekstu celokupne preduzetničke populacije u Srbiji i opštih karakteristika etničko-manjinskog preduzetništva u svetu. Cilj rada je da ukaže na značaj razvoja romskog preduzetništva za rešavanje ekonomskih i socijalnih problema ove etničke grupe. Anketiranjem 45 registrovanih romskih preduzetnika na teritoriji Republike Srbije utvrđeno je da se najveći broj njih bavi pružanjem usluga, poljoprivredom, prerađivačkom industrijom i reciklažom otpada. Romi su najčešće vlasnici mikro preduzeća koja su obično porodične firme. Romski preduzetnici posluju primarno na lokalnom tržištu na kome ostvaruju prihod višestruko manji od prihoda koji ostvaruju druge preduzetničke firme. Posmatrano prema polu, romski preduzetnici su najčešće muškarci. U proseku, romski preduzetnici su nedovoljno obrazovani i obučeni za vođenje posla jer, prema popisu stanovništva, svaki treći pripadnik romske zajednice ima osnovno obrazovanje, a svega 11,5% ima srednji nivo obrazovanja. Jedan od najznačajnijih problema sa kojim se sreću Romi u poslovanju je obezbeđenje finansijskih sredstava. Drugi značajan problem sa kojim se sreću Romi preduzetnici su visoki porezi i doprinosi na rad, a među ostalim problemima ističu se nedovoljno poznavanje zakona i procedura, siva ekonomija, nestabilne cene poljoprivrednih proizvoda, slaba platežna moć kupaca, predrasude kupaca, itd. U cilju razvoja romskog preduzetništva potrebno je obezbediti veću finansijsku podršku postojećim i potencijalnim romskim preduzetnicima iz javnih i donatorskih sredstava, ispitati mogućnost uvođenja novih načina finansiranja preduzetničke aktivnosti Roma, obezbediti različite oblike nefinansijske podrške romskim preduzetnicima, podsticati njihovo udruživanje i promovisati preduzetništvo među Romima.

Ključne reči: *Romi, preduzetništvo, etničko-manjinske zajednice, samozapošljavanje, porodično preduzeće, finansiranje, udruživanje, podrška razvoju preduzetništva.*

Introduction

In the last 20-25 years, we have been witnessing a growing importance of self-employment in ethnic minority communities in industrialized and developed countries. This trend was additionally boosted by deindustrialisation and a growing importance of the service industry, which significantly reduces employment opportunities of insufficiently educated immigrants or members of ethnic minority communities [12, p. 183]. A consequence of these factors throughout Europe, as well as other developed parts of the world, is a growing number of small enterprises owned by members of ethnic minority communities. These enterprises are mostly established in labour-intensive sectors of the manufacturing industry and traditional service industries operating in a narrow market within urban agglomerations. These enterprises' competitiveness factors vary, from longer working hours, willingness to provide loan arrangements to buyers/consumers, willingness to sell very small product quantities, etc., through a firm family tradition and demand for culture-specific products, to self-employment and employment of family members and members of their ethnic community, strong ethnic connections and specific cultural features of owners and family members.

Most frequent members of ethnic minority communities in entrepreneurial activities vary across countries. In France, those are Moroccans, Tunisians and Chinese, in the Netherlands, in addition to the aforementioned, there are also Indonesians, in Great Britain Indians, Pakistanis and Koreans, in Germany the most significant ethnic and minority community is Turkish, while in North America those are Chinese, Cubans, Japanese, Jews, Koreans, etc.

The Roma are the largest and most vulnerable ethnic group in the Republic of Serbia. According to the 2011 Census, there are around 150,000 Roma living in Serbia, and according to the Council of Europe, this number is estimated at 600,000 [5]. The Roma in Serbia face numerous problems, including health care, housing, education, difficult employability and access to the labour market. According to the 2011 census data, only 28% of the Roma population belongs to the group of the economically active, of which 59% is unemployed. Also, the number of

unemployed Roma women is four times greater than the number of unemployed Roma men [11, p. 79-80].

Key reasons for this unfavourable situation of the Roma can be seen in the low level of education and the existence of discrimination in the labour market [9, p. 11]. These difficulties in accessing the labour market have led to a large representation of the Roma in the informal economy. One possible solution for such a position of the Roma population is creating an environment that will be conducive to the development of Roma entrepreneurship.

With this in mind, during the period from March through December 2016, the Institute for Territorial Economic Development (InTER) and Yurom Centre conducted a research titled "Roma Entrepreneurship: Challenges and Perspectives" in order to provide an insight into the characteristics of Roma entrepreneurs, the specifics that burden entrepreneurs from the Roma community, and offer practical policy solutions that would strive to overcome the identified problems. This paper presents the key findings of the research that have been analysed in the context of the entire entrepreneurial population in Serbia, as well as some general characteristics of ethnic minority entrepreneurship in the world.

Research methodology and limitations

Research methodology included different qualitative and quantitative methods used in different research phases. The target group was defined at the beginning of the research, and a database was developed including 100 registered Roma entrepreneurs. The term "Roma entrepreneurs" is used for members of the Roma ethnic group who have started a business, regardless of the scope of business and the number of employees.

The views and opinions of entrepreneurs from the database were collected through a survey. The survey included 37 questions divided into the following six sections: general information about the business, administrative and legal framework, access to the labour force, access to capital markets, access to financial and non-financial support, the state of the market and business environment. A total of 45 registered Roma entrepreneurs were surveyed on the territory of the Republic of Serbia, of which 41 were

active at the time of carrying out the survey, two had a temporary closure status and two had recently closed the business. After collecting and analysing the data from the survey, the research team conducted interviews with Roma entrepreneurs, as well as with other stakeholders from the public and private sectors, international organisations and non-governmental associations. A total of eight Roma entrepreneurs were interviewed and 13 representatives of institutions and organisations supporting the development of entrepreneurship and inclusion of the Roma. In the final phase of the research, all data collected during the previous phases were analysed, and the findings drawn were additionally verified during panel discussions organised in Niš, Novi Sad and Belgrade.

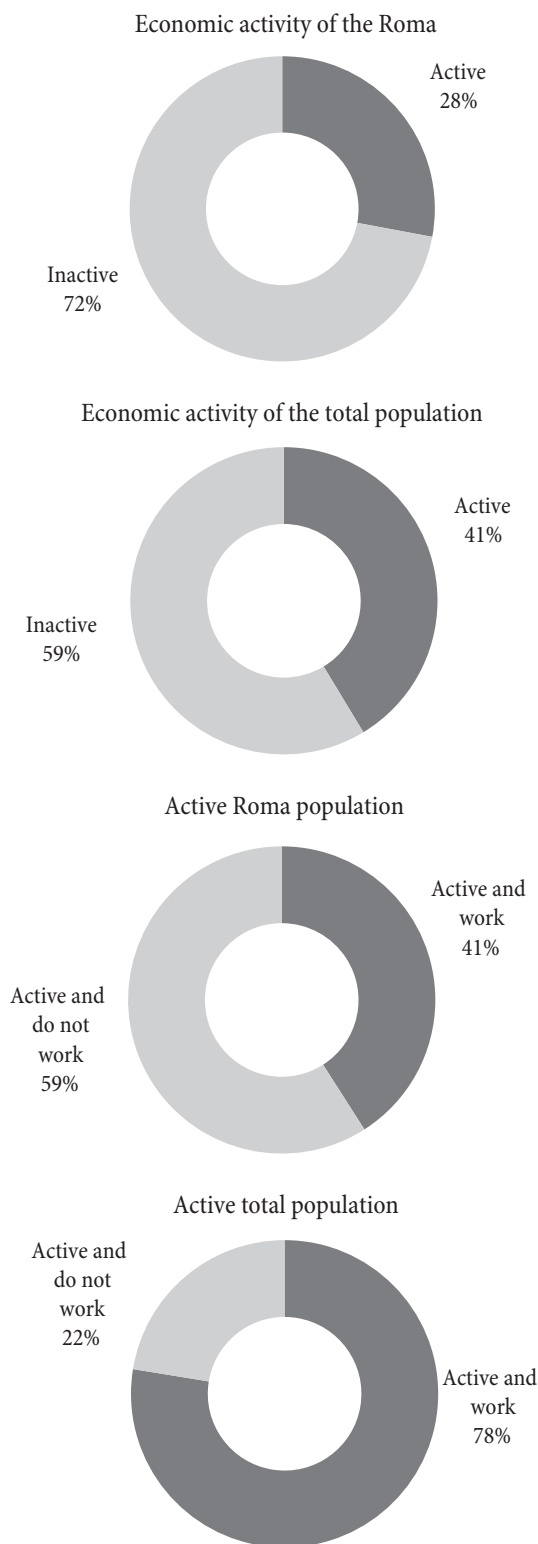
The biggest limitation of the research is the fact that it was not possible to determine the exact number of registered entrepreneurs in the Republic of Serbia who are members of the Roma ethnic minority. Namely, the registration of entrepreneurs does not keep records of their ethnicity, and there are no official data on the number of Roma entrepreneurs. This lack of information influenced the definition of the sample size and the identification of Roma entrepreneurs. For the purpose of the survey, contacts of Roma entrepreneurs were collected through institutions, non-governmental organisations and donors who have supported Roma entrepreneurs, which significantly facilitated their identification. Although the problem of determining the sample had not been overcome, subsequent interviews with Roma entrepreneurs confirmed the accuracy of the findings related to the problems in their business.

Economic activity of the Roma in Serbia

The data from 2011 Census indicate a low level of economic activity among the Roma. According to these data, only 28% of Roma population belongs to the category of economically active people¹, which is significantly less than the country's average (41%). Of economically active Roma people, only 41% work, which is also significantly

lower than the country's average (78%, see Chart 1). These data indicate that the Roma show much lower activity level compared to the Serbian average.

Chart 1: Economic activity of the Roma according to the 2011 Census



Source: [11, p. 78]

¹ According to the 2011 Census, an economically active person includes all persons, employed and unemployed, whereas an economically inactive person includes persons who do not work or seek employment (children younger than 15, retired persons, people with income from property, pupils, students, housewives and other persons) [11, p. 15].

The registry of unemployed persons in the National Employment Agency contains 25,748² members of the Roma minority. Considering that not all unemployed Roma are registered in this institution, this number is unofficially estimated as much higher.

Due to the low economic activity of Roma in the formal labour market, there is an evident large representation of this ethnic community in the informal economy. According to the data from a research conducted jointly by UNDP, the World Bank and the European Commission, the estimated unemployment rate among the Roma in Serbia amounted to 49% in 2011, and the rate of informal employment is estimated at 70% [1]. The data also indicate that Roma women are at a considerable disadvantage in the labour market, because out of the total number of active Roma who work, 22.5% are women [11, p. 80].

The most common occupation among active Roma are street sweepers and collectors of recyclables, with 59.3% [11, p. 79]. It is estimated that there are tens of thousands of individual collectors of recyclables, mainly Roma, who collect about 75% of the total collected recyclables in Serbia [9, p. 15]. Dominant occupations also include drivers and artisans with 10.8%, followed by farmers (9.9%) and retailers (8.9% [11, p. 79]).

According to data from the 2011 Census, of the total number of economically active Roma who work, 16% have their own business, and they are usually own-account workers. Also, the percentage of Roma who are self-employed among the economically active Roma is higher in comparison to the percentage of the total economically active population (Roma 10.9%, total population 4.1%, Table 1). On the other hand, a smaller share of Roma are individual farmers and employers, in relation to the total population. It is interesting to point out a high percentage of Roma whose profession could not be classified by categories of work status (up to 27.6%).

Table 1: Economically active population that performs an occupation, according to the work status³

	Roma	Population
Employed person	51.6%	75.7%
Employer	0.7%	2.7%
Own-account worker	10.9%	4.1%
Individual farmer	4.3%	9.2%
Contributing worker	1.4%	2.9%
Contract	3.5%	2.5%
Cooperative member		0.1%
Other	27.6%	2.8%

Source: [11, p. 81], [4, pp. 20-21]

Results of the research on Roma entrepreneurship in Serbia

General characteristics of Roma entrepreneurship

As already pointed out, around 100 businesses owned by Roma men and women were identified.⁴ The analysis of these data revealed that Roma entrepreneurs operate in different business activities, where the dominating activities are services and manufacturing industry, followed by waste management and trade. These activities were confirmed during the survey of Roma entrepreneurs (total of 45 respondents), because most respondents were from the service industry (12), agriculture (11), manufacturing (8) and waste recycling (8).

Similar to the structure of industries among surveyed Roma, the largest number of economically active persons in Serbia perform business in the manufacturing sector (17.2%), agriculture, fishing and forestry (14.8%), wholesale and retail trade, repair of motor vehicles and motorcycles (14.7%). Most small and medium-sized enterprises (SMEs) in 2015 were in the following sectors: wholesale and retail trade and repair of motor vehicles (94,220), services (83,073) and manufacturing (50,997). At the same time, manufacturing industry and wholesale and retail trade

² The data as at 30 November 2016. Statement given by a representative of the National Employment Agency at a conference on Roma entrepreneurship organised on 15 December 2016 in Belgrade.

³ This category includes persons who had at least one hour of work in the census week, formally or informally organised, and persons who have a job but were for objective reasons prevented from attending it during that week [4, p. 9].

⁴ OSCE Mission in Serbia has provided data to the research team about applicants within the call for best practice in Roma employment within the OSCE Mission in Serbia project "We Are Here Together – European Support for Roma Inclusion". These data are used for the analysis of activities of Roma entrepreneurs who participated in the call.

dominate in the SME sector in all indicators (145,000 enterprises, 55.8% of employees, 65% of turnover and 50.8% of GVA in 2015) [7, p. 20]. However, despite the formal similarities between Roma and other entrepreneurs in Serbia in terms of the breakdown of activities, substantial differences exist when looking at diversification of these activities, technical equipment and other features. For example, the research shows that the Roma manufacturing industry is dominated by low-tech businesses or labour-intensive activities that generate little added value and are not sufficiently competitive.

The Roma are typically owners of microenterprises that are mostly family businesses. There are no comprehensive data about the number and significance of family businesses in Serbia. However, by analogy with other countries,⁵ it can be concluded that family businesses in Serbia are significant, as well as among the Roma population. Bearing in mind the fact that, due to ideological prejudices, there was no intensive development of entrepreneurship in Serbia before the '80s or the '90s, it can be assumed that a small number of family businesses were created by succession, or the transfer of business leadership from one generation to another in the family, and that there is a much bigger importance of family businesses which actively involve several family members.

According to the research findings, two-thirds of respondents have between one and nine formally employed workers. When necessary, respondents hire seasonal workers, but they also have one or more unregistered workers. Household members are also hired as workers, but they are not registered as employed. By comparison, in 2015, an average number of employees per enterprise in the SME sector was 2.5. On average, a microenterprise employs 1.2, a small enterprise 20 employees, and a medium-sized enterprise 102.4 employees [7, p. 12].

Roma entrepreneurs, with their services and products, are mainly present in the place where they live (48%) or

at the regional level (37%). A small number (3 out of 45) export their products or services, usually plastic products, photographic services and media content production. According to these results, Roma entrepreneurs are not significantly different from entrepreneurs in other ethnic minorities, whose economic activity is mainly concentrated in narrow local markets.

As for revenues, one in two respondents generated less than one million dinars of annual revenues in 2014, and one in three generated revenues between one and eight million dinars. Significantly higher revenue per company was recorded in the SME sector as a whole. In 2015, the revenue per company in the SME sector was 19.4 million dinars, where microfirms had an average turnover of 7.7 million dinars, small 184.7 million, and medium-sized 970.8 million dinars [7, p. 27].

Analysed by gender, Roma entrepreneurs are mostly men. The study included 29 male and 16 female Roma entrepreneurs. Women entrepreneurs are more present in the service industry (hairdressing and beauty, cleaning), manufacturing (cakes and cookies, tailor's shop) and in agriculture. However, they also collect secondary recyclables, work in production of plastics, and other professions. It is important to note that there are cases where registered owners of sole trade businesses or enterprises are women, while business is managed by male family members.

Low level of education and professional skills is a factor which influences entrepreneurship development among the Roma. According to the census data, one of three Roma people has primary education, and only 11.5% have a secondary education.⁶ Low education level among Roma entrepreneurs was evident in the research, because most respondents have a primary or a secondary school diploma, only 13% college or university education. However, it is important to mention that there are no significant differences among respondents regarding the educational structure in relation to gender.

Limitations in the available data make it difficult to compare the personal characteristics of Roma entrepreneurs with the overall entrepreneurial population in Serbia. Unfortunately, there are no serious recent sociological,

⁵ In the U.S., there are around 16 million family-owned businesses, which is around 90% of all businesses, employing more than 40 million people and generating around 60% of gross domestic product of the U.S. [13, p. 745]. It is estimated that in Great Britain, 75% of all enterprises are family businesses [6, p. 156]. Family businesses are also very important in Europe, where two out of five enterprises have two family generations, and it is estimated that in South America, South Asia and the Middle East the number of enterprises with two family generations is even greater.

⁶ Only 22% of young Roma attend secondary school, whereas this figure amounts to 90% in the general population [14, p. 35].

psychological and similar studies of entrepreneurs in Serbia. According to available data, based on the research conducted by the Institute for Sociological Research of the Faculty of Philosophy in Belgrade, Serbian entrepreneurs are a very heterogeneous social group. Educational structure of entrepreneurs is relatively favourable, much more favourable than the educational structure of Roma entrepreneurs, because 55% of respondents have secondary education, 15% have a college degree, and 27% a university degree [2, p. 494]. The age structure of entrepreneurs in Serbia is such that only 4% of respondents are older than 55, 38% are between 36 and 45 years of age, 40% between 26 and 35, while 7% of respondents are younger than 26 [2, p. 497]. Personal matrix, as the image entrepreneurs have of themselves, largely deviates from the results of the study of entrepreneurs in countries with developed market economy. Our entrepreneurs (on average) estimated themselves as: industrious people (24%), tenacious people (21%) and people with self-esteem (10%), while other features are selected by a small number of respondents (from 8% to 1%) [3, p. 397].

Challenges in business

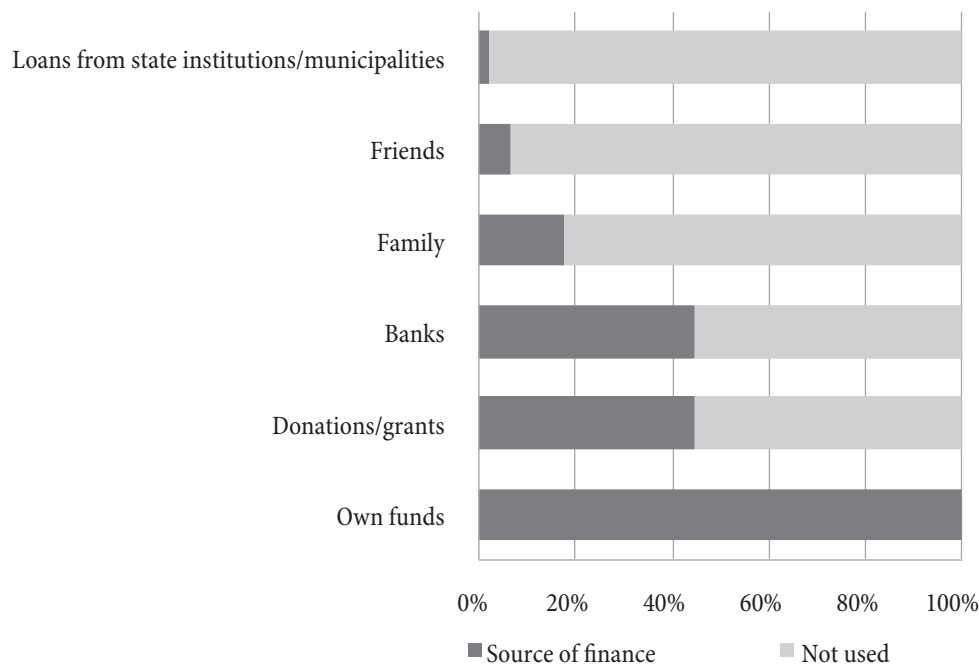
Most of the interviewed Roma entrepreneurs financed operations with their own funds. As for external sources

of finance, bank loans and donations (grants) were primarily used (Chart 2). Also, the research found that entrepreneurs with a higher operating income were more prone to taking bank loans. Most bank loan users did not have much difficulty in repayment, although they agree that interest rates could be lower. On the other hand, 56% of respondents did not take loans because they could not meet the conditions, or due to expensive and lengthy procedures for loan approval. Surprisingly, family was not selected as an important source of finance for the business.

Providing funding and resources for business is the greatest challenge faced by Roma entrepreneurs, especially in the initial phase of operation. According to the survey, 64% of respondents (Chart 3) states that they need financial support to improve operations, such as favourable loans with longer grace periods or subsidies. When it comes to work facilities, the greatest need is the acquisition of equipment, but the problem is also the supply of raw materials and the provision of work space.

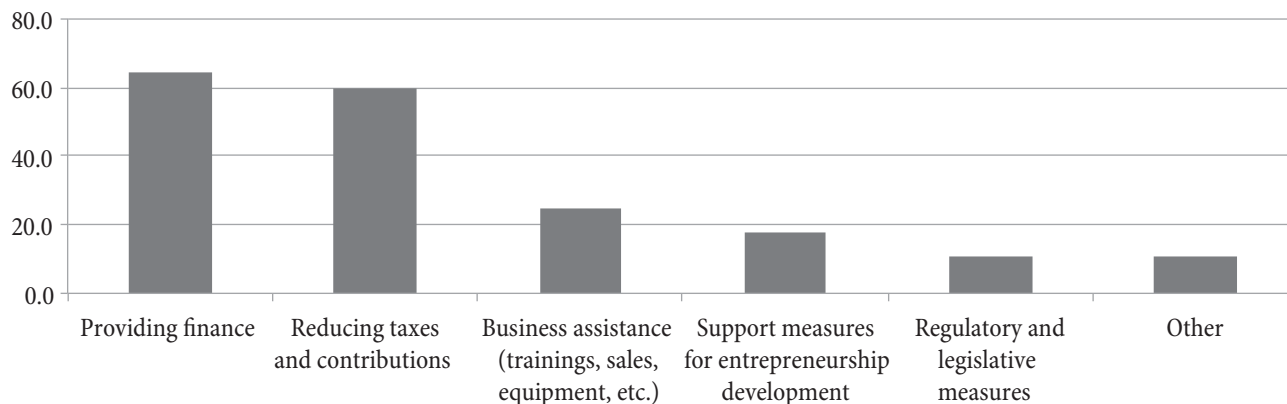
There have been several donor and national projects and programmes which supported Roma entrepreneurship. These projects and programmes were mostly focused on providing assistance to Roma people for self-employment, and they rarely included assistance to business owners and entrepreneurs from the Roma community who could

Chart 2: Source of finance for business



Source: Results of the research on Roma entrepreneurship

Chart 3: Business services and regulatory changes that would significantly contribute to improved conditions for business development



Source: Results of the research on Roma entrepreneurship

provide sustainable employment for the Roma. Financial assistance for Roma entrepreneurs mostly included business start-up and assistance for new employees (from the Roma community), and funds were most often allocated for purchase of equipment and machinery. The amount of provided funds and conditions for collateral varied, depending on the support programme. Most significant funds were provided through the OSCE project “We Are Here Together – European Support to Roma Inclusion”, with the average amount of around 20,000 € per supported enterprise.⁷ UNOPS project “EU Support for Roma Employment” provided grants of 3,400 € per beneficiary.⁸ German organisation HELP provides financial assistance for self-employment of Roma people with 1,500, 2,400 and 3,600 € grants. Also, HELP has financially supported the establishment of cooperatives and several associations whose founders belong to the Roma community.

Financial assistance for Roma entrepreneurs is also provided by the National Employment Agency through public calls within the programme “Self-Employment Subsidies for Roma People”. This programme included subsidies for entrepreneurs of 180,000 dinars in 2016, and 160,000 dinars in 2015.⁹ Provincial Secretariat for Economy, Employment and Gender Equality, in cooperation

with the Office for Roma Inclusion, also had a call for self-employment applications, which has supported the establishment of around 100 enterprises owned by the Roma [8]. Apart from these two programmes, there are no other programmes or measures at the state, provincial or local level which support the development of entrepreneurship among the Roma [9, p. 15].

Obtaining funds is one of the biggest problems for all entrepreneurs in Serbia. The majority of SMEs do not have access to all sources of finance, and funds they obtain from available sources go together with conditions less favourable than those for large companies. This is primarily due to a higher risk of financing these enterprises than the risk of financing large companies. In that sense, entrepreneurs are in a somewhat closed circle for financing, because undercapitalisation of these enterprises is one of the most frequent causes of their high failure rates. On the other hand, high failure rates of newly established enterprises increase the risk for financing, which is why financial organisations are not willing to provide loans or invest in them. It is important to emphasize that there are no financial organisations and institutions in Serbia established for the purpose of easier collection of finance from ownership of loans, such as venture capital funds, guarantee funds, etc. Apart from the problems related to securing funds, entrepreneurs in Serbia also face significant fiscal and parafiscal burdens.

Even though the problems with finance are common for all entrepreneurs, some are especially serious in case

⁷ This project supported 17 enterprises and provided equipment of the total value of 365,000 €.

⁸ The project “EU Support for Roma Employment” provided financial assistance to 51 beneficiaries (30 Roma men and 21 Roma women).

⁹ As a part of this programme, 65 contracts were signed in 2016 with the members of Roma community, and 98 in 2015.

of Roma entrepreneurs. A significant problem is the lack of collateral. Roma entrepreneurs have property of relatively low value, due to several factors, starting from their poverty, the location of their real estate, its lack of marketability, quality of construction, etc. Lack of collateral is a problem, not only to obtain loans from banks, but also to have access to finance from other, non-banking sources (donations, grants, etc.).

High taxes and contributions for labour are also a great burden for the development of entrepreneurship among the Roma. According to the findings of this research, 60% of respondents stated that the reduction of taxes and contributions would significantly contribute to the improvement of their business (Chart 3). Bearing in mind that Roma entrepreneurs usually have low revenues, high taxes and contributions for salaries notably threaten their business and encourage work in the informal economy. The research results indicate that two-thirds of respondents have employees who are not registered. The prevailing opinion is that this problem can be solved only by reducing labour taxes and contributions.

There is also a visible problem of insufficient knowledge of the laws and procedures. According to the research data, one in three respondents claims that insufficient knowledge of laws and procedures limits their business operations. This problem is more common with the surveyed female entrepreneurs (one out of two) than male (27% of the surveyed entrepreneurs).

Grey economy is one of the biggest challenges faced by entrepreneurs in Serbia, which is not surprising given that the size of grey economy is estimated at 30.1% of GDP [5, p. 2]. This phenomenon also affects Roma entrepreneurs, and the research showed that one-third of respondents stated that unfair competition was the main problem they faced in the market. The problem of unfair competition, which affects the operation of registered business entities with low prices of products and services, is underlined.

Other challenges faced by Roma entrepreneurs in the market are mainly unstable prices of agricultural products, poor purchasing power of buyers and sales of products and services. Roma entrepreneurs, especially farmers, are faced with prejudice of customers, which negatively affects the price of their products.

Access to qualified labour is not a difficulty for the majority of Roma entrepreneurs, which can be explained by the fact that respondents are mainly engaged in activities that do not require highly skilled workers. The labour force is often hired within the immediate and extended family, or in the local community. There are examples of members of the Roma community not wanting to be registered because in this case they lose the right to social welfare. About 60% of respondents emphasized the need for further training of workers, which suggests that there is a clear need to improve the quality of the workforce.

The respondents generally state that they want to expand business (83% of male and half of female respondents), primarily due to the fact that survival of their families depends on the business. However, one out of ten respondents is planning to close the enterprise or sole trade business, due to the inability to keep pace with the competition, due to the reduction in price of products/ services and increased operating costs.

Business associations and cooperation among entrepreneurs

Roma entrepreneurs are characterized by a low level of gathering into business associations. Based on the results, 70% of respondents are not members of any business association. Those who are a part of some associations usually belong to professional associations and Roma NGOs. It is important to emphasize that there is no association of Roma entrepreneurs in Serbia that would promote the improvement of conditions for their business, development of business skills or a joint approach to the market.

Roma entrepreneurs also have a low degree of cooperation with business associations and business development service providers. According to the research findings, only a few respondents had contact with the Serbian Chamber of Commerce, and only one of them is a member. Roma entrepreneurs rarely come into contact with other organisations that offer business development services, such as clusters, regional development agencies and similar organisations. According to the survey results, respondents had no contact with the Union of Employers or business incubators. These results can be explained by the fact that associations of entrepreneurs, chambers of

commerce and development agencies do not deal with issues that are targeting entrepreneurship among Roma.

There is a visible need among respondents to connect through cooperatives, particularly in the area of collecting recyclables, agriculture and construction works. An example of this type of association is a building cooperative “Mahala 1” from Niš, founded in 2015 with the support of Yurom Centre and the German NGO Help. The cooperative “Mahala 1” performs various tasks in the field of construction and it is also involved in house renovation projects in Roma settlements. Another example of joint work is the Roma eco-recycling Centre “Amala 1”, which brings together about 30 collectors of recyclables. “Amala 1” was founded in 2014 in Pirot as a civic association.

Roma entrepreneurs cooperate with international organisations and non-governmental associations, and as for state institutions, with the National Employment Service. This is directly related to the existence of different support programmes for the development of entrepreneurship within Roma community implemented by these organisations.

Conclusion

Previous analysis showed that there were certain similarities, but also many differences between Roma entrepreneurs and other entrepreneurs in Serbia, and these differences are mainly at the expense of Roma entrepreneurs and their businesses. Thus, the Roma entrepreneurs are less educated and trained to run a business than an average entrepreneur in Serbia, have lower entrepreneurial inclination, operate in more labour-intensive sectors with lower technical complexity that create less added value, generate much lower revenues, etc.

The problems faced by Roma entrepreneurs are basically similar to the problems encountered by other entrepreneurs in Serbia, but some of these problems manifest themselves in a more severe form and in a specific way, which is primarily the result of higher vulnerability of the Roma population and their operation to obstacles and problems in business. Therefore, the well-known and confirmed measures of financial and non-financial assistance supporting the growth, establishment of

new and development of the existing SMEs will have a positive impact on the development of entrepreneurship in general, including Roma entrepreneurship. However, high sensitivity of Roma entrepreneurs to obstacles in business and specific problems this population is faced with requirement that some of the systemic economic measures and policies be carefully designed and tailored to the specifics of Roma entrepreneurship. Just as the EU, aware of the fact that small companies are the most sensitive part of its economy, is committed to respecting the “Thinking Small First” principle when designing economic policy, the government of the Republic of Serbia should design specific instruments for the promotion of Roma entrepreneurship. Although the development of Roma entrepreneurship is *conditio sine qua non* for solving social problems of the Roma population, those measures should only partly be aimed at supporting social entrepreneurship. Those should primarily be measures to encourage the solutions for economic and social problems of the Roma by achieving economic goals through entrepreneurship, since Roma entrepreneurship, as well as the entrepreneurship of any other ethnic minority, is primarily an economic phenomenon.

Drawing from these notes and the research results, the first area where a significant contribution to the promotion of the establishment and growth of businesses can be achieved is financial assistance. It includes a number of economic measures, primarily related to loan, monetary and fiscal policy, but also the need to develop specialised institutions and organisations. In addition to general measures to encourage lending activities of banks, they also include ensuring more favourable sources of finance for existing and potential Roma entrepreneurs through greater financial support from public and donor funds. The establishment of a guarantee fund would encourage bank lending, because it would contribute to alleviating the problem of credit risk due to a lack of collateral.

Non-financial support should primarily be focused on solving the problem of inadequate education and training of Roma for entrepreneurial activities, as well as promotion of mutual cooperation among the Roma, and cooperation of the Roma with other members of the social and business community. In this sense, it is necessary

to provide intensive training for business improvement to Roma entrepreneurs (business plan development, mentoring, assistance with marketing, participation in fairs, etc.), and organise professional trainings specific to their business. In addition, it is necessary to encourage cooperation between Roma entrepreneurs through the establishment of associations that would gather Roma entrepreneurs and build capacity for the improvement of Roma entrepreneurship including advocacy for a better position of Roma entrepreneurs in Serbia. It is also necessary to encourage cooperation between Roma entrepreneurs and other business associations and business development service providers (chambers of commerce, regional development agencies, business incubators, clusters, etc.). A significant problem of the informal economy can be gradually solved by encouraging the transition of Roma entrepreneurs from the informal to the formal sector through various measures such as: gradual reduction of social benefits, the introduction of incentives for the payment of taxes during the first year of operations, encouraging business registration, etc. Finally, in order for these measures to be effective, it is necessary to ensure the participation of Roma community in the process of developing, implementing and evaluating programmes aimed at promoting entrepreneurship and continuously analyse the effects of support programmes for self-employment of unemployed Roma.

References

1. *Analysis of the UNDP/World Bank/EC Regional Roma Survey 2011*. (2011). Retrieved from <http://bit.ly/2io44I9>
2. Bolčić, S. (1993). „Novi menadžeri“ u privatnim firmama u Srbiji početkom 90-ih. *Sociologija*, 2, 243-251.
3. Bolčić, S. (1994). The spread of entrepreneurship in Serbia in the early nineties. *Sociologija*, 4, 369-401.
4. *Ekonomska aktivnost stanovništva koje obavlja zanimanje*, Knjiga 19. (2014). Beograd: Republički zavod za statistiku Republike Srbije. Retrieved from <http://bit.ly/2ikQEAz>
5. *Estimates and official numbers of Roma in Europe*. (2012). Council of Europe. Retrieved from <http://bit.ly/2hP1ple>
6. Fletcher, D. (2000). Family and enterprise, In S. Carter & D. Jones-Evans (Eds.), *Enterprise and small business: Principles, practice and policy* (pp. 155-165). Harlow, England: Prentice Hall.
7. *Izveštaj o malim i srednjim preduzećima i preduzetništvu za 2015. godinu*. (2016). Beograd, Ministarstvo privrede.
8. Kancelarije za inkluziju Roma Vojvodine. Retrieved from <http://bit.ly/2helqYt>
9. *Monitoring sprovođenja nacionalne Strategije i Akcionih planova za unapređivanje položaja Roma u kontekstu procesa pristupanja Srbije u EU i Zakona o zabrani diskriminacije*. (2015). Beograd: Stalna konferencija romskih udruženja građana (SKRUG) – Liga Roma. Retrieved from <http://bit.ly/2hDjDOJ>
10. *Nacionalni program za suzbijanje sive ekonomije*. (2015). Vlada Republike Srbije. Retrieved from <http://bit.ly/2iOuMHT>
11. Radovanović, S., & Knežević, A. (2014). *Romi u Srbiji - Popis stanovništva, domaćinstava i stanova 2011. u Republici Srbiji*. Beograd: Republički zavod za statistiku Republike Srbije.
12. Ram, R., & Barrett, G. (2000). Ethnicity and enterprise, In S. Carter & D. Jones-Evans (Eds.), *Enterprise and small business: Principles, practice and policy* (pp. 182-1197). Harlow, England: Prentice Hall.
13. Scarbough, N. M., & Zimerer, T. W. (1996). *Effective small business management*, Upper Saddle River, NJ: Prentice Hall.
14. *Strategija za socijalno uključivanje Roma i Romkinja u Republici Srbiji za period od 2016. do 2025. godine*. (2016). Službeni glasnik RS br. 26/2016.



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ONLINE SERVICES: CONNECTING BUSINESS AND ACADEMIA THROUGH NEW TECHNOLOGIES*

Onlajn usluge – povezivanje privrede i akademije
putem novih tehnologija

Abstract

In the recent period, in the process of value creation, the importance of collaboration between business and academic communities has gained more interest. In order to respond efficiently to the challenges that students and graduates face with when entering the labor market, joining efforts of all social agents involved in the system is necessary and crucial. Internet technologies enable this process by facilitating networking and flow of information. The paper analyzes a platform created for connecting entrepreneurs, students and professors, serving as an online marketplace for research projects. By applying the AIDA model, it is observed that the platform drew significant attention and interest regarding its use, while additional measures are required in order to achieve greater results concerning instigation of action. Further implications are discussed and recommendations are suggested.

Keywords: *marketing, AIDA, Internet, services, entrepreneurship, youth*

Sažetak

U skorije vreme, važnost saradnje između poslovnog i akademskog sektora, u procesu stvaranja vrednosti, privukla je više pažnje. Ujedinjavanje napora svih društvenih agenata u sistemu ne samo da je neophodno, nego je i od presudne važnosti u cilju efikasnog odgovora na izazov ulaska studenata i diplomaca na tržište rada. Putem kreiranja mreža i olakšavanja protoka informacija, internet tehnologije omogućavaju taj proces. U radu je analizirana platforma putem koje se povezuju preduzetnici, studenti i profesori, a koja služi kao svojevrsna berza istraživačkih radova. Primenjujući AIDA model, ustanovili smo da je platforma privukla značajnu pažnju i interesovanje za korišćenje, ali i da su dodatne mere potrebne kako bi se postigli bolji rezultati vezani za podsticaj na akciju. Dalje implikacije su diskutovane i predlozi za poboljšanje sugerisani.

Ključne reči: *marketing, AIDA, internet, usluge, preduzetništvo, mladi*

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“We don’t need no education”. Well, you do!

The latest research for Serbia demonstrate that young people who are entering the labor market experience great difficulties in finding a job, while governmental policies do not provide enough incentive for entrepreneurship. Labor Force survey [42] suggests that the unemployment rate for population aged 15-24 amounts to 41% (vs. 20.8% for the general population). The share of self-employed persons is 23%, while in a cohort of youth (15-24) it is only 13.7% [26]. However, as Hutchinson et al. [22] observe, the demand for self-employment among young people in Serbia is high, but remains unmet. In 2011, the youth made up roughly 25% of the 20,000 people who inquired with the National Employment Service about the Government of Serbia-sponsored start-up grants. In addition, a recent survey shows that 33% of young people would prefer to have their own business rather than safe but low-paid jobs that are generally available. They have a highly developed entrepreneurial spirit. A study conducted at the global level reveals that young people aged 25-34 form a group that displays the greatest entrepreneurial inclination of all [37]. One fifth of them wishes to be “self-employed”, i.e., start their own private business, while a similar percentage of women decides not to have children in order not to sacrifice their careers [2].

The lack of necessary knowledge remains one of the main constraints for the start of one’s own business. A study [6] conducted throughout a three-year period, which included 1990 students from four universities and business schools in Serbia, revealed that the interviewed students reported that they lacked the knowledge of the basics of entrepreneurship and small business. The problem which arises when the youth join the labor market has its roots in a much earlier period – during elementary and secondary schooling, and therefore should be addressed at these levels. Recent studies conducted worldwide (summarized in [45]) emphasize the positive relationship between the level of financial literacy and youth entrepreneurship. Financial literacy is the main resource for society to fight against poverty and financial vulnerability. Herein we adopt the following definition [32] of financial literacy: “Financial literacy is knowledge and understanding of

financial concepts and risks, and the skills, motivation and confidence to apply such knowledge and understanding in order to make effective decisions across a range of financial contexts, to improve the financial well-being of individuals and society, and to enable participation in economic life.” The definition highlights that financial literacy is concerned with the way individuals understand, manage and plan their own economic affairs, and with their awareness and understanding of the overall economic landscape they live in. It is also recognized that good understanding, management and planning on the part of individuals produces significant collective impact on the wider society in contributing to national, and even global stability, productivity and development.

Research undertaken in developing countries, such as Bosnia and Herzegovina [1], Ghana [35] and Poland [40], ascertained that financial literacy among youth entrepreneurs contributed meaningfully to their entrepreneurship skills. More evidence on this relationship is available in developed countries – e.g. findings of the “Mini-companies in secondary education” report [13] reveal that 19% of the students who had participated in the Young Enterprise mini-company program in Sweden started their own companies by the age of 29 and through their own companies employed 16,000 people. Similar results were obtained for Norway – 20.5% of the respondents between the age of 25 and 34 who took part in the program had established their own companies. The comparable rate at national level in Norway for 25 to 34 year-olds was calculated at 4.5%. At present, 45 countries at different income levels are well-advanced in the design or implementation of a national strategy for financial education; and another widening group of countries is considering developing one. The youth are a priority target of an overwhelming majority of the existing national strategies [31].

It should be noted that certain efforts in this domain have been made in Serbia, too. According to the Ministry of Education, Science and Technological Development, approximately 15-20% of present-day students in vocational high schools in Serbia will get entrepreneurial education during their schooling. With regard to the fact that vocational secondary schools (both three- and four-year) are attended by 73% of the students, it means that only

11-14.5% of the total number of high school pupils will obtain any kind of entrepreneurial training during their secondary education.

Moreover, it is of crucial importance to work on the advancement of the position of females in the labor force and society; given that the gender gap in financial literacy is of particular concern, as women are more likely to become economically vulnerable than men [45]. A number of studies (e.g. [23], [3]) established that the provision of financial literacy education for women entrepreneurs had a significant impact on the probability of both starting and expanding a business. A Norwegian survey [13] reveals that 30% of those establishing their own companies after completing upper secondary school are women, and that 50% of business leaders are women. At the time when the survey was conducted, women accounted for 19% of the total share of owners, and 16.5% of company directors in Norway. This shows that entrepreneurial education during high school may also have an influence in increasing the share of women in top management, and positively affect creating equal opportunities between genders when it comes to achieving leading positions in companies.

Business and academia on the same mission

On the other hand, the SMEs face competitiveness challenges mostly due to the deficiency of innovation, proper development strategies and cooperation, both among themselves and with experts from the R&D institutions [16]. Although solution to the problem lies in cooperation between the SMEs and R&D experts, quality connections between them are lacking. Hence, the SMEs need professionals within the companies who would develop new products/technologies in accordance with their business policies. These very professionals would represent the necessary link, and students have been identified as the optimal target group. According to Đuričin and Vuksanović [8], “the strategy to build technological breakthrough in the middle-income countries includes three following stages. First, assimilation of the state of the art technology by using licensing, technology transfer, FDI, etc. Second, co-development of leading edge technology through public-private partnerships (PPP).

Third, “leap frogging” to emerging technologies which involve PPP in R&D”.

The year 2016 has been declared the “Year of Entrepreneurship” [46] when the state introduced a major package of various programs whose goals are to: enhance entrepreneurial strengths, help entrepreneurs start or improve their business, and provide financial and non-financial support to the long-term development of the entrepreneurial spirit. During the year, based on the entrepreneurial approach, a rather specific set of measures was implemented to help the private sector, but also to incite strategic actions of launching comprehensive social efforts for the inauguration of the principles of entrepreneurship as a dominant philosophy in the economics, education, culture, government policies and all major social processes. The role and contribution of the higher education institutions (HEIs) to this cause has been foreseen in the implementation of education (formal and informal), increase in the innovation capacities of the SMEs through joint work, but also in the design and implementation of various programs for direct support to the economy, such as: organizing student competitions for the best entrepreneurial idea, establishing start-ups in schools, spreading the entrepreneurial spirit through educational programs during the first cycle of studies.

In a broader sense, the 2015-2020 Strategy for Supporting the Development of Small and Medium Enterprises, Entrepreneurship and Competitiveness (hereinafter: the Strategy [19]) establishes the framework, objectives, priorities and measures to promote the development of micro-, small and medium-sized enterprises and entrepreneurship in the medium run. The objective of this Strategy is to improve conditions for the development and competitiveness of micro, small and medium enterprises and entrepreneurs (SMEs).

The framework of measures for improving competitiveness of the SMEs is presented through six pillars:

- 1) Improvement of the business environment;
- 2) Improvement of access to financing;
- 3) Continuous development of human resources;
- 4) Strengthening sustainability and competitiveness of the SMEs;
- 5) Improving access to new markets; and

- 6) Development and promotion of entrepreneurial spirit and encouraging entrepreneurship of women, youth and social entrepreneurship.

In the context of the HEIs, the most important aspects of the Strategy pertain to the improvements in the field of human resources and to the goal of increasing innovation capacities of the SMEs. The Strategy cites and explains in a detailed and comprehensive manner the problems that the SMEs are facing with in conducting their business in the domestic economy, as well as in cooperation with the science and education institutions. The identified problems are primarily related to:

- Inadequate resources for development of innovative products/services/technology/process;
- The lack of legal framework to regulate collaboration between businesses and research and development (R&D) organizations or too extensive dispersion in the legislation;
- Problems in the partners' perception of the process of technology transfer and lack of expertise and experience of each of them;
- Coordination of the SMEs and R&D organizations;
- The lack of entrepreneurial skills, perceiving that the HEIs do not sufficiently prepare the youth to successfully enter the labor market;
- Discrepancy between the formal education system and the needs of the modern labor market;
- Inadequate and insufficient financial structure.

Within Pillar No. 6 of the Strategy – Development and promotion of entrepreneurial spirit and encouragement of the women's, youth and social entrepreneurship, it is stated:

“Young people are in a disadvantaged position in the labor market, which is characterized by the low activity rate; while the rate of the youth unemployment is quite higher than the average unemployment rate of the economically active population. Most of the youth are long-term unemployed, along with a significantly large number of new-comers to the labor market, who are simultaneously first-time job seekers. A large portion of young people is involved in the informal labor market, and only 11% are opting for self-employment. However, it could be concluded that young people are interested

in developing their own businesses, given that a large number attended training for entrepreneurs organized by the NARR.

In addition to the lack of professional experience and professional practice, which can be an aggravating factor in the decision to start one's own business, young people face the problem of underdeveloped entrepreneurial skills as a result of the lack of adequate educational programs in secondary schools and universities, designed to encourage the development of entrepreneurship among young people. Improvements in the education system and a greater support to the youth entrepreneurship could be significant factors of the society's development and of the alleviation of the problem of high unemployment rates among young people, and these will also enable the utilization of the innovative potential that young people possess.”

The Action Plan details the set of the activities for each measure within the specific dimensions and pillars [18]. It especially focuses on building of innovative capacities of the SMEs, alignment of educational programs with the needs of the labor market and on the trainings related to the application for and acquisition of the EU funds. Moreover, a set of measures for the incitement of collaboration between the SMEs and the HEIs is proposed, as well as promotion of cooperation in the field of technology transfer. However, thorough review and inspection of the specific activities outlined in the Action Plan reveals that measures listed therein do not take into account the educational institutions in practical terms.

Business sector on the Internet in Serbia

Business sector in Serbia has recognized the importance of computerization and the use of the Internet. Data [25] shows that almost all Serbian companies are connected to World Wide Web, and that they mostly access it by a broadband type of a connection. Moreover, a great majority of them (98.6%) utilizes e-government services in order to search for information or to retrieve and fill in necessary forms and documentation. Only 9.3% of Serbian companies pay for cloud computing services.

When it comes to their presence in the virtual sphere, the fact that only 80.8% of companies have their websites suggests that we still have a long way to go to achieve standards of the business sector in the developed countries. Information and services that enterprises provide on their web presentations are demonstrated in Figure No. 1. It is also important to notice that less than a quarter of them use the Internet in order to search and find appropriate candidates for open work positions within their companies.

The underuse of the potentials of Internet is also manifested by the statistics that solely 36.1% of the companies have used Facebook, LinkedIn, Xing and Yammer for business purposes; 12.5% used Twitter; 14.6% considered YouTube, Flickr and Picassa (multimedia sites for content sharing); and 8.3% regarded Wikipedia as a useful tool. Even more discouraging is the fact that there is a negative trend in the use of the Internet for ordering practices – only 41% of companies resorted to it in 2015; and only 23.3% took orders (except by email) in this way. Exploitation of the Internet possibilities varies depending on the industry in which companies operate and on the range of the services that they provide [15, p. 52]. Larger companies and enterprises working in the services sector tend to take advantages of the ICT in a greater volume than the others.

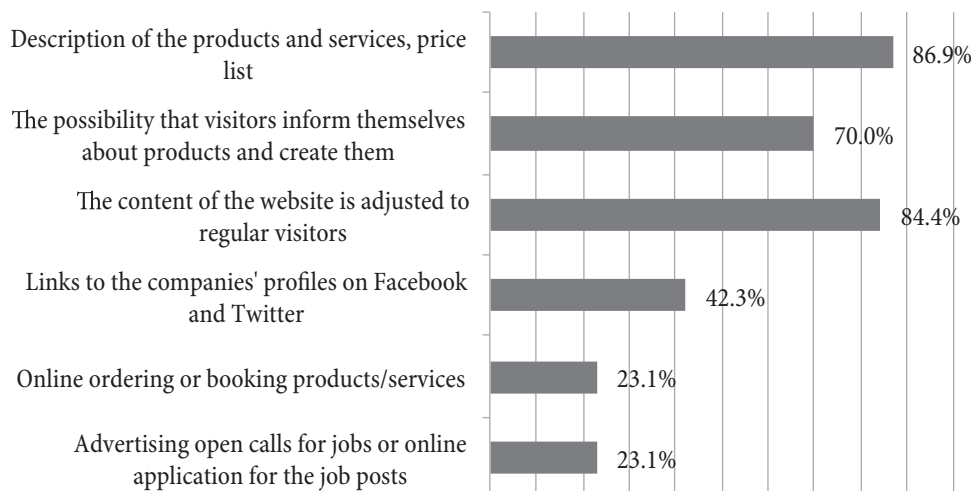
Methodology

Development of the research questions

The idea of connecting academia and business is not new. However, it has just recently drawn greater attention of the HEIs by embedding these core values in the paradigm of the “third mission of the university”. Hence, universities have adapted and articulated their role in the social, cultural and economic development of the wider society [10]. The “third mission” can be aggregated into the following activities: (a) engaged research (technology transfer and innovation, etc.); (b) engaged education (lifelong learning/ continuing education, public training, etc.); enabling access to studying to vulnerable groups; creation of an open society and support to cultural diversity and broader horizons through participation in mobility schemes (including business-academia); (c) social engagement (public access to lectures or concerts, initiating public debates on important social issues, voluntary work and consultancy by the university staff and/or students, etc.).

Universities are expected to assume a more active role in regional and national economic development, while facing competition from other public and private higher education and research institutions [33]. As economies are becoming increasingly knowledge-based, great expectations have been established for universities as

Figure 1: Information and services provided by Serbian companies on their websites



drivers of knowledge, value creation [29] and shaping the innovation system, especially at a regional level. Additionally, the social impact of higher education is also substantial in the European agenda, because the European Commission expects higher education to support societal development through continuing education [7]. The core of social engagement activities is volunteering. For example, the HEIs representatives could provide: (a) social consultancy – using expertise to solve problems pro bono (for example, through law shops); (b) educational outreach - running a more informal kind of learning programs (for example, summer camps for pupils, workshops in elementary and secondary schools); (c) services and facilities – putting resources to work for society (e.g. asylum for animals, translation services, creation of websites for charity organizations). Universities should develop joint actions for the benefit of society, in which professors and students could participate together. For example, they could: teach classes for pupils and disabled people, paint together on buildings, organize events and actions to collect financial or material help for vulnerable people or children.

The new mission of universities is very much stimulated and driven by the characteristics of the new generation of students and young workers – the so-called Millennials. They put much higher ponder to their private life than to business achievement, unlike the previous generations; and they are also oriented toward social causes and overall welfare more than any age cohort before. Members of the millennial generation wish to deal with matters related to responding to certain social challenges, and try to come up with new solutions to certain existing problems, such as making solar panels, extending microcredits in developing countries, management of the food banks [17]. They do not just want to know how to perform a task, but they also want to know why it is important to do it in the first place. An interesting job and the possibility of learning at the workplace are very important components of their satisfaction. Companies should consider introducing programs for learning on the job, given that the members of this generation attach great importance to it [21]. This is why the American Express offices in New York pay its employees to attend courses of their choosing (e.g. photography, pottery, painting), while Scooter Store allows its employees to play table tennis in

the room next to the lobby whenever they want to relax and entertain themselves [30].

Moreover, they need constant feedback from employers. Employers commonly conduct performance evaluation once a year. However, the Millennials would rather have this assessment conducted at least twice a year [24]. In fact, in one study [41], 60% of them reported that they would like if their managers stated their assessment of workers' performance on a daily basis, while 35% of them would prefer to receive the feedback several times a day. In line with this, members of the millennial generation react highly positively to "one-on-one" mentoring [43]. They need supervision and help of experienced colleagues in solving problems, especially in the field of dealing with issues concerning "difficult" clients [34]. Although these young workers are quite independent persons, they are very reliant on others when it comes to searching for information, and expect others to help them at any time of day or night. However, due to the fact that they grew up at a time when many economies collapsed and their parents lost their jobs, they are used to caring for themselves and investing abundantly in education in order to be in a better position to earn their living [44, p. 157].

RQ1: The HEIs, business sector and students are willing to donate their resources and collaborate in order to improve their capacities and promote entrepreneurship within their social engagement agenda

Moreover, more than other generations, they decide to become members of professional associations and to seek professional help in their job search. In their search for work, they rely highly on personal contacts, which they consider to acquire in the associations [21]. However, given that they are "Net. Gen.", most of them find jobs on the Internet. This trend became especially relevant by the spread of LinkedIn social network, as well as by the start-up of the specialized social networks for specific professions. Internet has become one of the most recognized media for job search in the Serbian market, as well, given the great presence of domestic websites in this area, such as: www.lakodoposla.com, www.nadjiposao.rs, www.poslovi.rs, <http://poslovi.infostud.com>.

One of the latest trends that attracts more and more followers in all parts of the world is the concept of open

innovation. The essence of the concept is quite simple – more people in one place will lead to the creation of a large number of ideas, which will in turn increase the chances of creating innovations. Many global companies such as Google, Apple, Procter and Gamble, IBM and Toyota have already successfully implemented this concept in their business processes, and based on that have achieved excellent results. Companies do not have to create, explore and research all the phenomena in-house, by themselves, but they should create an appropriate network of partnerships in their environment, thus to join efforts with all social and business agents in order to ensure optimal results. While the idea of open innovation was established in the previous century [5], its full implementation has been obtained only in the recent times, with the promotion of the information technology.

Users can be involved in the innovation process in many ways: as users – those who propose the ideas, as co-creators and as testers of the products and services of a company. Compiling the ideas involves the use of traditional methods of collecting the users' opinions (e.g. in the case of the HEIs, those would be the students): surveys, focus groups, interviews with direct service providers (e.g. teachers, administrative staff, sales operations), etc. With the rise of online tools, searching through blogs, comments and other content generated by the users is also used, with the aim to reveal the aspects in which it is possible to improve the offer of an organization.

Joint creation (co-creation) of products and services includes a high degree of users' involvement in the manufacturing process of the company. One of the most characteristic aspects of this cooperation is a joint work on the "Open Source Software". The company provides to all interested developers access to the programming code that the company created, which enables developers to improve and change it, while these changes become publicly available to all other users. Some examples of open software are: Linux, Mozilla Firefox, Joomla, OpenOffice.org. Users can also test the trial version of a product or service in the Internet environment, while it is still in the development stage (beta version).

One example that demonstrates successful collaboration between the academic and business communities and

competences in the field of open innovation is the Elgg platform. Elgg is an online community where developers from all over the world work together to develop tools for social networks which are freely available to all users. The platform was launched by Dave Tosh and Ben Werdmuller in 2004, as a result of the ideas recognized in the process of writing their joint papers. Combining their knowledge and experience – Tosh was a postgraduate student of online education, while Werdmuller was an Internet entrepreneur who had been dealing with the construction and management of the online communities since 1995 – they introduced the approach of using social networks in the electronic education. In building their virtual communities, their software, among others, were used by: Stanford University, John Hopkins University, University of Brighton, University of Oregon, NASA, the World Bank. [9].

The variety of opportunities to combine scientific and business concepts is also demonstrated by the example of Science Exchange, established in 2011 by Assistant Professor at the University of Miami, Dr. Elizabeth Iorns, Ryan Abbott and Dan Knox [39]. Science Exchange functions like a freelance marketplace. Researchers post an experiment they would like to outsource, and then receive bids from experimental service providers. The researcher selects a bid, and Science Exchange facilitates communication, project management and payment via its platform. The company receives a service fee based on the value of the project, and the entire process is conducted through this website. Another great advantage is the fact that since 2012 the Science Exchange has developed a program that helps scientists in validating the results of their research through the reproduction of the results of the experiment, by means of its re-implementation by other independent laboratories.

RQ2: The Internet enables and facilitates in a unique way effective cooperation and synergy between business and academia

The industries in which innovations by users are present for a long time are: automobile, bike, banking, food, cosmetics and home appliances. However, in these cases management is usually faced with three types of problems: finding and motivating users; determining the amount of

user's contribution and integration of all the contributions into a single product or a service [36]. Companies should take into account that contributors are mostly young, ambitious people who are not motivated by financial gain, but by personal affirmation, to obtain approval of others, to obtain practical knowledge and to experience the enjoyment of creativity on a job [28]. Hence, it can be concluded that the HEIs might obtain numerous and significant improvements by exercising open innovations, particularly with regard to their competitive advantage contained in the fact that they have access to the appropriate group of "innovators" – young, creative and ambitious people [14].

Sample

Three main separate, yet closely related, target groups could be detected and recognized in this research: students, entrepreneurs and university lecturers. Given that the core concept is cooperation of the business sector and the R&D institutions, it could be stimulated through creating a channel of communication between the parties in question, in the form of an online market for research project calls published by the companies. Consequently, it is considered that all parties would have strong motives to participate.

University and secondary school students represent final users of this online market platform. The youth is in search of experience in executing specific research tasks (possibly used for graduate/master's theses), internships and future business opportunities (both in existing companies and in starting a private business). They can use the platform in order to complete their compulsory academic tasks, establish contacts, gain relevant experience and possibly to obtain job positions by proving their qualities in a timely fashion. The studies listed in the first chapter of this paper unequivocally reveal that students consider working in the private sector to be significantly better, compared to working in the public sector, for the reasons ranked as follows: financial compensation, relevant experience and the possibility of promotion.

The second group is made of researchers and scholars eager to provide mentorship and support to students, to participate in business research projects, connect and exchange ideas with colleagues throughout the region, help

social and economic development on local and regional levels. Besides pedagogical reasons, this is also a valuable chance to start cooperation with representatives of the business sector. This way, social engagement of the HEIs will be supported and more promoted, while individual researchers could exercise their ideas and models in the real business environment, enlarge their knowledge through practical trainings and obtain financial support for further research endeavors.

Finally, entrepreneurs (mainly the SMEs, but also large business systems) on the territory of Serbia play a very significant role in the operation of the platform. Their activities pertain to supplying the online marketplace (its database) with research project tasks which would hopefully result in sourcing adequate employees, receiving professional consulting services from regional experts, developing new products, services and technologies and networking. It will help them develop new and enhance the existing technologies/products, test potential employees in actual business situations, introduce potential employees to the organization and its policies before official employment (this significantly reduces expenses and period of adjustment upon possible employment) and improve their brand and reputation.

The platform

For the purpose of the research, an online platform has been created (Networking of the Business and Education Sector – N@PRED, www.napred.rs). The aim of the platform, which operates as an online marketplace for research projects, is to enable enterprises, on one hand, to publish specific research tasks needed in their practice, thereby transforming one's business development challenges into research opportunities for others. On the other hand, this provides students with the opportunity either to apply for these specific internships within the companies whose field of work is their field of interest, or to provide them with the necessary material for writing graduate papers/master's theses on these specific matters. In addition to this bilaterally fruitful model, the youth are given the possibility to work together and be adequately supported by their mentors – researchers from higher education, research and development institutions, who are actively included, as well.

The marketplace for research projects is much like the online labor market. However, instead of connecting employers with their potential employees and job candidates, its aim is to connect companies in search of innovative students (for executing research projects) with the academic community, or with students and their mentors. Such a model is multilaterally beneficial on multiple levels. It offers a convenient possibility for companies to preselect and hopefully recruit highly suitable candidates for job positions, as well as to estimate and assess them in actual work conditions and contexts (since hiring highly trained and experienced professionals is not financially affordable for the majority of the SMEs). Moreover, their products and business processes will be improved by the solutions and ideas provided by the students. Simultaneously, students are provided with the chance to obtain relevant experience, to improve their knowledge and skills through the mentorship of researchers, to work in successful enterprises and finally, possibly to obtain employment. Moreover, student participants are provided with valuable know-how regarding the basics of entrepreneurship (observed from the inside perspective), which the majority of them recognized as the main constraint for self-employment and starting a small enterprise.

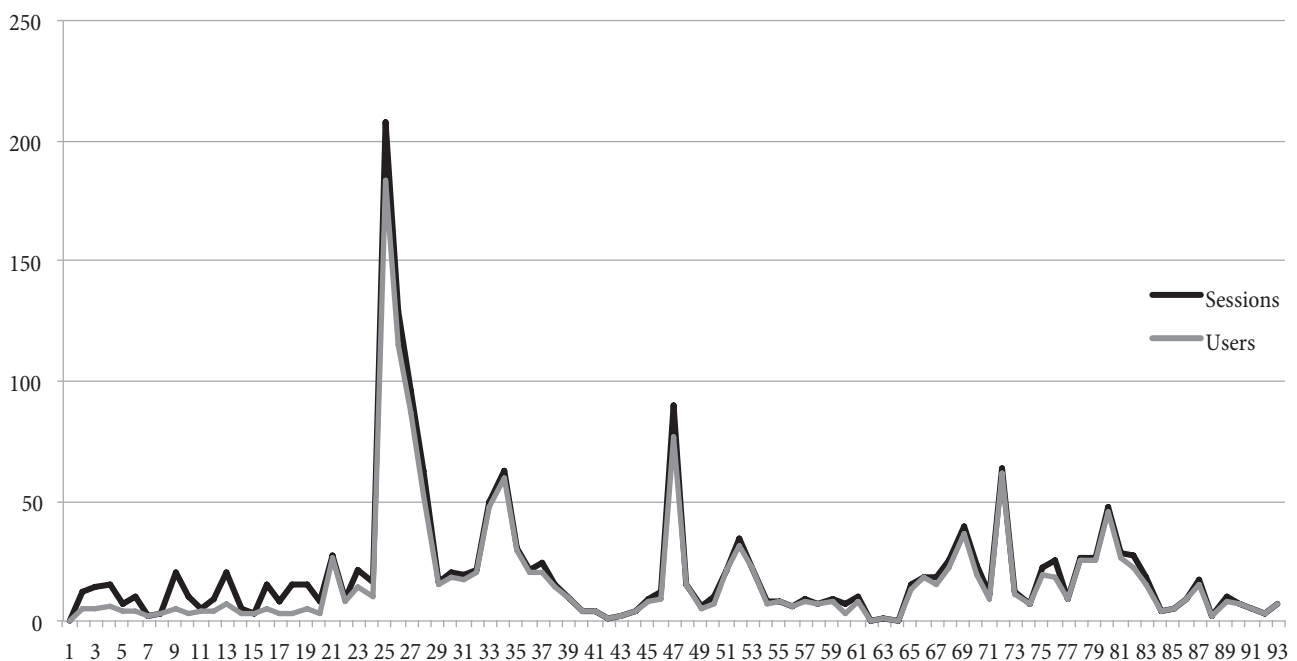
The platform-marketplace is completely free (no fee is to be charged either to the companies or students/

academic community members) and available to everyone. The availability of the information regarding specific development challenges faced by an enterprise that published a research project task is highly expected to initiate and stimulate further, perhaps international, cooperation and networking. The core concept is building both on the EU strategic framework for fighting youth unemployment – Youth Employment Package [11] and Youth Employment Initiative [12] – and on the Serbian National Youth Strategy [20], which commits to the improvement of youth employability in the following ten years. This innovative solution to increase employment and employability of young people (and primarily a direct aid to the SMEs in increasing their competitiveness) in a practical way is checked and proved in Croatia and Slovenia through the project “Marathon”, funded by the IPA funds, under the leadership of the Centre for Research, Development and Technology Transfer of the University of Zagreb. This project was a continuation of the successful completion of the related project “SPRINT”, also financed by the EU funds, which continued to produce excellent results.

Results

In our analysis, we shall adopt the AIDA model [27] and estimate the effects that the platform achieved during the

Figure 2: The number of platform users and sessions in the three-month period



three-month period. The first stage considers drawing attention of the target groups, evaluated by the number of users who accessed the platform and sessions that were held. During the said period, 1912 sessions took place and 1614 visitors were registered, indicating that the platform raised significant awareness.

In order to gain insight in the interest that the platform incited, we need to perform a more profound analysis of the activities on the website. The trends of users' access to the platform and related sessions are presented in Figure No. 2. It is observable that in the first stages of the platform development, users visited the platform several times a day, most probably in order to explore its possibilities and to get acquainted with all the options it offered. Later on, these numbers tend to equalize.

In the figure, several peaks are noticeable, when number of sessions exceeded 30 visits a day. Higher traffic occurred after 12 days, as a result of the promotional activities. Examination revealed that promptly after the organized trainings on the modes of use of the platform, both for students and businessmen, the traffic on the website increased. This result suggests that Internet has a high potential to attract the interest of all target groups and to bridge a gap among them, but it needs to be supported by other promotional tools in the real environment.

Furthermore, the users' desire to interact with the content of the website is reflected in their returning patterns and time that they spent on the platform (the related data are provided in Table No. 1). Given that one third of the sessions was executed by the returning visitors, based on the benchmark analysis [4], it can be concluded that the content was engaging and correctly customized for the target groups. In addition, returning visitors viewed more than double the pages than new visitors, and their sessions lasted over three times more than those of the users who accessed it for the first time. However, a very high bounce rate for returning visitors (almost equal to the rate of new visitors) implies that they expected to

see other content on the first page of the website, either different by nature or more updated.

In this sense, it is also interesting to observe the share of first-time visits in the overall number of sessions. Pearson's correlation coefficient shows that there is a moderate correlation ($r = 0.407$, $p = 0.000$) between the number of users and the percentage of new sessions, indicating that with the growth of the traffic, it is more probable that more sessions will be achieved. Therefore, it is conclusive that the first-time visitors considered the landing page to be appropriate and that it met their expectations.

The final stage of the AIDA model is action, in our case measured by the number of registered users and the number of new entries for job posts. Having in mind that the campaign for the business sector took place only in the last month of the observed period, just before the summer holidays (mid-June), a rather modest result of six entries was recorded as expected. Hence, we consider the number of registered platform users as a much more adequate indicator of the website's potential to incite action. During three months of its operation, 268 students, 37 mentors and 59 companies were registered at the platform. The dynamics of their registration on the basis of three-day periods is depicted in Table No. 2.

Thorough inspection of the data reveals that the platform attracted the greatest attention of the students, while their interest remained at the same level throughout the observed period. On the other hand, the platform proved to be the least potent to urge mentors to take action – both in the sense of the overall number of users in this target group and the growth rate. Opposite to that, the increase in the number of registered companies was significant and steady throughout the whole timeframe.

Discussion and conclusions

The results clearly show that both of the research questions have been proved. There is a will among the businessmen

Table 1: Users' activities on the platform

User Type	Sessions	Bounce Rate	Pages/Session	Avg. Session Duration
New Visitor	1,289	48.95%	3.87	0:03:18
Returning Visitor	623	40.13%	8.70	0:11:30
Total/Average	1,912	46.08%	5.45	0:05:59

and the academia for collaboration, while the Internet represents the missing link in the process of connectivity and networking. It is notable that so far, all activities to increase the innovative potential of the SMEs have been based on providing capital and financial support, whereas relationship building and sharing the competencies and resources between the SMEs and R&D organizations have been neglected and lacking. In the forthcoming period, the improvement of cooperation between the two sectors should be in focus for the advancement of innovative entrepreneurs.

In addition to the aim of connecting companies with students/mentors/researchers through the platform, there is a great possibility of networking among the companies themselves, which is to result in sharing experience regarding similar development challenges faced, investing joint efforts to overcome the aforementioned, and finally, in better business results. The same assumption could be extrapolated to students and researchers among themselves: students/mentors can interconnect, as well. These established bonds are likely to initiate a domino effect, causing further linking between potentially interested parties and building a strong network of entrepreneurs, students, researchers and professionals in various fields, in general. Should we take into consideration the similarity of the languages spoken in the Western Balkans region and the similarity of the problems and obstacles met in the business sector, higher education and academic community, as well as the omnipresent nature of the Internet, international impact

of the platform may be assumed with great probability. This leads to the recognition of the additional value that the respective Internet service possesses: its contribution to more successful sourcing and recruiting professionals in the field of development, as well as the enablement of international exchange of business ideas and professionals.

High unemployment rates in the previous period, among other factors, were generated due to the discrepancy between the needs of the economy and the qualifications of the workforce educated at the HEIs. In order to bridge this gap in the future, it is necessary to harmonize study programs and enrollment policy with the needs of the market. Moreover, it is necessary that the teaching process includes practical work realized in real-life conditions – i.e. in the future workplace. This way, the relationship between employers and employees will be established early on, which will in turn enable the exchange of knowledge, specific needs of the company will be addressed and the transition from study phase to work phase will be facilitated. A course in entrepreneurship, as well as the courses in related business disciplines (marketing, management, organization, etc.), should be introduced in the first cycle of study programs at most faculties. This way, young people would be encouraged to create their own jobs – through the establishment of start-ups, to cope with the market risks and develop innovations. Through the work of the centers for lifelong learning and career development, universities should facilitate the process, design and carry out informal

Table 2: Number of registered users per target groups

Periods (May 20th – July 18th)	No. of students	No. of mentors	No. of companies
1	217	34	48
2	225	35	48
3	232	36	48
4	237	36	49
5	238	36	49
6	247	36	50
7	256	36	52
8	257	37	53
9	258	37	55
10	259	37	57
11	261	37	57
12	263	37	58
13	264	37	59
14	268	37	59
Total of registered participants	268	37	59

trainings in the field of entrepreneurship, which would be aimed both at their students and graduates, managers, employees, entrepreneurs and other market participants.

Bearing in mind that in [38] Serbia was ranked on the 69th place in terms of quality of the science and research organizations, while it occupied the low-ranked 125th place regarding private sector investment in research and development, it is clear that it is necessary to strengthen, or even establish the relationship between these two sectors. Establishing relationships can be organized through the provision of funding for the SMEs and their cooperation with the HEIs, through joint work in professional associations as well as through the work of science parks and business incubators at universities. This way, development of innovative SMEs will be encouraged, transfer of knowledge and technology from academia into business will be improved and the commercialization of the results of scientific research will be put in force. It is necessary that the university community designs and implements customized programs for the SMEs, which would be related to capacity building in the field of non-technological innovations, such as the use of information and communication technologies, marketing, organization, successful business communication skills.

Policies, programs and activities related to the expansion and greater use of knowledge are being continuously broadened and innovated on a global level. The accelerated growth, internationalization of business, the progress of modern technology, but also the challenges that transcend the boundaries of individual countries, and even the region, impose the need for uniting efforts to respond to them adequately. In addition, with the increase in the complexity of the environment, the progressive complexity of the problem and the increasing number of factors that define them, there is a need for a multidisciplinary approach in order to efficiently overcome these challenges. Given the opportunities that information technology provides, as well as the orientation of the scientific community toward cooperation and mutual engagement, the resulting system is an open innovation.

The open innovation system is widespread in the business sphere, while its optimal application in the field of science is still to be found. Bearing in mind the goals and

key activities of European programs, such as Horizon 2020, Erasmus plus and IPA, it can be expected that the growth of the scientific and business cooperation will become noticeable even in the medium term, but the benefits will be realized for the entire society. The paradigm of open innovation will continue to evolve through new forms, allowing for even greater liberalization of the flow of the knowledge and its effective implementation.

References

1. Bruhn, M., & Zia, B. (2011). *Business and financial literacy for young entrepreneurs: Evidence from Bosnia-Herzegovina*. World Bank mimeo.
2. Bryant, L. (2005). Only on the web. *Chico State Inside*, 35, 411-422.
3. Calderon, G., Cunha, J. M., & De Giorgi, G. (2013). *Business literacy and development: Evidence from a randomized controlled trial in rural Mexico* (No. w19740). National Bureau of Economic Research.
4. Cheng, R. (2015). *How loyal are your customers? This metric has the answer*. Retrieved from <https://contently.com/strategist/2015/08/18/how-loyal-are-your-customers-this-metric-has-the-answer/>
5. Chesbrough, H. W. (2003). *Open innovation: The new imperative for creating and profiting from technology*. Boston: Harvard Business School Press.
6. Čočkalović, D., Đorđević, D., Bogetić, S., Sajfert, D., & Minovski, R. (2013). Quality of business, entrepreneurship education and business start-up intentions among students in Serbia: Research results. *Industrija*, 41, 125-145.
7. Crosier, D., Dalferth, S., Kerpanova, V., & Parveva, T. (2011). *Modernisation of higher education in Europe: Funding and the social dimension*. Education, Audiovisual and Culture Executive Agency, European Commission.
8. Đuričin, D., & Vuksanović, I. (2015). Think through strategy: New vision for industrialization of economy and modernization of society. *Ekonomika preduzeća*, 63(1-2), 1-15.
9. Elgg. About Elgg platform available at <http://elgg.org/powering.php>.
10. European Commission. (2012). *Green paper fostering and measuring 'third mission' in higher education institutions*. European Commission.
11. European Commission. (2012). *Youth employment package*. European Commission.
12. European Commission. (2013). *Youth employment initiative*. European Commission.
13. European Commission. (2005). *Best procedure project: "Mini-companies in secondary education" – Final report of the expert group*. European Commission.
14. Filipović, J. (2015, February). Reč u trendu – „otvoreno”: inovacije i pristup. In V. Katić (Chair), *XXI skup Trendovi razvoja: „Univerzitet u promenama"*. Symposium conducted at the meeting of the University of Novi Sad, Zlatibor.
15. Filipović, J. (2016). *Internet marketing*. Belgrade: CID Faculty of Economics.

16. GEDI Institute. (2014). *Global entrepreneurship index 2014*. Retrieved from <https://thegedi.org/>
17. Gloeckler, G. (2008). Here come the Millennials. *Business Week*, 4109, 47-50.
18. Government of the Republic of Serbia. (2015). *Action Plan for the implementation of the Strategy of supporting the development of small and medium enterprises for 2015 with a projection for 2016*. Retrieved from <http://www.privreda.gov.rs/wp-content/uploads/2015/06/Akcioni-plan-mala-i-srednja-preduzeca.pdf>.
19. Government of the Republic of Serbia. (2015). *2015-2020 Strategy for supporting the development of small and medium enterprises, entrepreneurship and competitiveness*. Retrieved from www.privreda.gov.rs/wp-content/uploads/2015/06/Strategija-mala-i-srednja-preduzeca.pdf.
20. Government of the Republic of Serbia. (2015). *The first draft of the National youth strategy 2015-2025*. Retrieved from <http://www.mos.gov.rs/wp-content/uploads/2014/10/National-Youth-Strategy-2015-2025-First-draft.pdf?lang=lat>.
21. Hayes, T. (2006). Money matters for generation Y. *B&T*, 56, 28.
22. Hutchinson, J., Guttentag, M., Chen, Y., & Mo, K. (2012). *Youth entrepreneurship in Serbia: Constraints and opportunities*. Belgrade: USAID.
23. Karlan, D., & Valdivia, M. (2011). Teaching entrepreneurship: Impact of business training on microfinance clients and institutions. *Review of Economics and Statistics*, 93(2), 510-527.
24. Kooser, A. (2008). Trend: Millennials. *Entrepreneur*, 36, 65.
25. Kovačević, M., Pavlović, K. & Šutić, V. (2016). *The use of the information and communication technology in the Republic of Serbia, 2015*. Retrieved from <http://webzrzs.stat.gov.rs/WebSite/userFiles/file/UpotrebalkT/ICT2016s.pdf>.
26. Krstić, G., Arandarenko, M., Nojković, A., & Vladislavljević, M. (2010). *Položaj ranjivih grupa na tržištu rada Srbije*. Beograd: UNDP.
27. Lagrosen, S. (2005). Effects of the internet on the marketing communication of service companies. *Journal of Services Marketing*, 19(2), 63-69.
28. Lerner, J., & Tirole, J. (2002). Some simple economics of open source. *The Journal of Industrial Economics*, 50(2), 197-234.
29. Nelles, J., & Vorley, T. (2010). From policy to practice: Engaging and embedding the third mission in contemporary universities. *International Journal of Sociology and Social Policy*, 30(7/8), 341-353.
30. Nelson, B. (2007). Tips and techniques to bridge the generation gaps. *Healthcare Registration*, 16(4), 3-5.
31. OECD. (2013). *Advancing national strategies for financial education*. Russia's G20 Presidency and the OECD.
32. OECD. (2013). *PISA 2012: Financial literacy framework*. OECD Publishing.
33. Piirainen, K. A., Andersen, A. D., & Andersen, P. D. (2016). Foresight and the third mission of universities: The case for innovation system foresight. *Foresight*, 18(1), 24-40.
34. Proffitt Reese, M., Rowings, L., & Sharpley, T. (2007). Employee benefits of the future. *Employee Benefit Plan Review*, 61(7), 21-25.
35. Rugimbana, R., & Oseifuah, E. (2010). Financial literacy and youth entrepreneurship in South Africa. *African Journal of Economic and Management Studies*, 1(2), 164-182.
36. Ryzhkova, N., & Bengtsson, L. (2013). Managing online users in open innovation: The case of a Nordic telecom company. *Communications & Strategies*, 89, 37-53.
37. Schoof, U. (2006). *Stimulating youth entrepreneurship: Barriers and incentives to enterprise start-ups by young people* (No. 388157). International Labour Organization.
38. Schwab, K., & Sala-i-Martin, X. (2015). *World Economic Forum's global competitiveness report 2014-2015*. Retrieved from <http://reports.weforum.org/global-competitiveness-report-2014-2015/>. Switzerland: World Economic Forum.
39. Science Exchange. About Science Exchange available at <https://www.scienceexchange.com/about#team>.
40. Skiba, J. (2009). Economic and financial education in Polish schools. In *RBI-OECD international workshop on financial literacy NBP*. Retrieved from <http://www.cab.org.in/FILCPortal/Lists/International%20Experience/Attachments/15/3.2%20-%20Presentation%20-%20Jakub%20Skiba%20-%202022-03-2010.ppt>.
41. Spencer Lee, K. (2008). Some tips for gen Y workers. *Computerworld*. Retrieved from <http://computerworld.co.nz/news.nsf/care/1B48DE8F090141EDCC25744400109765>.
42. Statistical Office of the Republic of Serbia. (2014). *Labour force survey 2013*. Belgrade: Statistical Office of the Republic of Serbia.
43. Steiner, J. (2007). Six steps for guaranteeing generation Y productivity. *Supervision*, 68(7), 6-7.
44. Sutherland, A., & Thompson, B. (2003). *Kidfluence: The marketer's guide to understanding and reaching generation Y – kids, tweens and teens*. McGraw-Hill.
45. Xu, L., & Zia, B. (2012). *Financial literacy around the world: An overview of the evidence with practical suggestions for the way forward*. World Bank Policy Research Working Paper, (6107).
46. Year of Entrepreneurship. (2016). Retrieved from www.godinaPreduzetnistva.rs/



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LEGAL AND PROFESSIONAL REGULATIONS AS DETERMINANTS OF THE QUALITY OF FINANCIAL REPORTING: EMPIRICAL RESEARCH*

Zakonska i profesionalna regulativa kao determinanta kvaliteta finansijskog izveštavanja - empirijska istraživanja

Abstract

The quality of financial reporting has always been a topic of lively discussions. It has attracted attention even in developed countries with good accounting infrastructure, mainly due to the emergence of huge financial scandals that have been usually associated with creative (fraudulent) accounting. A poor quality of financial reporting presents a particular problem in underdeveloped countries, which often do not have an adequate supporting infrastructure. The resulting implications are inefficient and unreliable legal solutions, inconsistent changes in the normative base, incomparability of financial statements, absence of independent oversight institutions or their dysfunctional structure, and weak protection of the public interest.

Bearing in mind the unsatisfactory situation in the field of financial reporting in the Republic of Serbia, this paper focuses on three objectives. The first objective is to call attention to the importance of high-quality financial reporting, not only for the accounting profession, but primarily for ensuring the greater certainty for investors, efficient functioning of capital markets and the prosperity of national economies. In this context, we have identified key pillars of financial reporting infrastructure which are essential for achieving the required level of quality in this field. The second objective is to point out the roles and responsibilities of different participants in the chain of financial reporting in the development of high-quality legal and professional regulations. Finally, the third objective is to demonstrate the inefficiency of certain legal solutions based on the results of empirical research on the attitudes of professional accountants toward the quality of legal and professional regulations, as well as to analyze the prospects for overcoming such a situation.

Keywords: *financial reporting quality, pillars of quality, legislation, professional regulations, accounting profession, ethics, public interest, accountability, comparability*

Sažetak

Rasprave o kvalitetu sistema finansijskog izveštavanja su uvek aktuelne. One su aktuelne i u razvijenim zemljama koje imaju dobru računovodstvenu infrastrukturu i često su podstaknute pojavom velikih finansijskih skandala koji su najčešće praćeni kreativnim (prevarnim) finansijskim izveštavanjem. Poseban problem predstavlja nedovoljan kvalitet finansijskog izveštavanja u nedovoljno razvijenim zemljama, gde često ne postoji kvalitetna infrastrukturna osnova. Prateće manifestacije su loša i nestabilna zakonska rešenja, nekonzistentne promene normativne osnove, neuporedivost finansijskih izveštaja, nepostojanje ili nefunkcionalno postavljanje nezavisnih nadzornih institucija i loša zaštita javnog interesa.

Imajući u vidu nezadovoljavajuće stanje na području finansijskog izveštavanja u Republici Srbiji, u osnovi ovog rada smo postavili tri cilja. Prvi cilj je vezan za podsećanje na važnost kvalitetnog finansijskog izveštavanja, ne samo za računovodstvenu profesiju, već prvenstveno za sigurnost investitora, funkcionisanje tržišta kapitala i prosperitet nacionalnih ekonomija. U tom kontekstu razmotreni su ključni stubovi finansijskog izveštavanja koji čine neophodnu infrastrukturnu osnovu za dostizanje potrebnog kvaliteta na ovom području. Drugi cilj je vezan za ukazivanje na nadležnosti i odgovornosti različitih učesnika u lancu finansijskog izveštavanja za stvaranje kvalitetne zakonske i profesionalne regulative. Konačno, treći cilj je da se kroz rezultate empirijskih istraživanja, koja su zasnovana na stavovima profesionalnih računovođa o kvalitetu postojeće zakonske i profesionalne računovodstvene regulative, ukaže na (ne)prihvatljivost pojedinih zakonskih rešenja i mogućnosti prevazilaženja takvog stanja.

Ključne reči: *kvalitet finansijskog izveštavanja, stubovi kvaliteta, zakonska regulativa, profesionalna regulativa, računovodstvena profesija, etika, javni interes, odgovornost, uporedivost*

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Introduction

Changes in environment, including the globalization of markets for goods, services and capital, structural changes in the economy driven by the shift from a traditional to a knowledge-based economy, growing complexity of business transactions, increased demands on financial reporting, and attempts to distort economic reality in financial statements, have made the process of financial reporting far more complex. Bearing in mind the importance of financial reporting in both private and public sector, it is quite understandable why the issue of the quality of financial reporting has sparked a great deal of interest all over the world. It is well known that financial reporting has a significant role in providing more certainty for investors, attracting foreign investment, developing capital markets and stimulating economic growth. The role of financial reporting in the public sector is equally important, as it contributes to the efficient allocation of scarce resources, the prevention of corruption and protection of the public interest. Contemporary trends in the field of financial reporting involve intensive efforts toward the convergence of accounting standards, institution building on national, regional and global level, raising the quality of education and providing a continuing education with the aim of improving the professional skills and competencies of accountants, etc.

Underdeveloped countries, such as the Republic of Serbia (hereinafter referred to as the RS), are faced with somewhat more complicated situation because there is often not enough understanding of the importance of financial reporting or there is a complete absence of the key institutional prerequisites for the development of high-quality financial reporting system. There are several factors that impede the development of a reliable financial reporting system in the Republic of Serbia, such as: frequent changes in legal regulations, lack of awareness about the global achievements in the field of financial reporting, problems regarding the adoption and application of global regulations (International Financial Reporting Standards – IFRS/International Accounting Standards – IAS and International Financial Reporting Standards for Small and Medium-Sized Enterprises – IFRS for SMEs)

and regional regulations (EU directives), disunity and a lack of mutual respect among key participants in the chain of financial reporting, inadequately established and dysfunctional institutions which ought to guarantee the normal functioning of financial reporting, a complete liberalization of the accounting services market, and disregard of the public interest.

Taking into account the gravity of the aforementioned problems as well as the inability to analyze all their aspects in this kind of scientific work, in this paper we primarily focus on some issues relating to the financial reporting infrastructure or the key pillars of the quality of financial reporting. More specifically, our attention is particularly directed to two pillars which are considered the main prerequisites for the development of a high-quality financial reporting system, i.e. the legal and professional regulations as important factors of the quality of financial reporting in every country. They largely determine the relevance and reliability of financial statements, on the basis of which all stakeholders of a company (owners, creditors, business partners, management, government bodies and the general public), make their economic decisions. Of course, the need for protecting the public interest raises a question about the accountability and responsibility for the functioning of the financial reporting system.

The accounting profession has the primary responsibility for the application of legal and professional regulations in the process of financial reporting. In doing so, its mission is to ensure the reliability and reliability of the published accounting information. Therefore, it has every right to judge the quality of the relevant regulations that are applied in the process of preparing and presenting financial statements. Thus, our research is focused on identifying the attitudes of professional accountants toward the quality of the existing legal and professional regulations of financial reporting in the RS. Accordingly, the research questions are defined as follows:

1. How does the application of IFRS/IAS affect the comparability of financial statements of domestic and foreign companies and their ability to attract foreign investment?

2. What is the impact of the existence of 13 charts of accounts, overly extensive financial statement forms, and a large number of normative bases for the valuation of balance sheet items on the work of professional accountants and the quality of financial statements?
3. Should all entities be allowed to apply full IFRS/IAS and IFRS for SMEs? Is there a need for a special rulebook on the manner of recognition, valuation, presentation and disclosure of items in the financial statements for microenterprises?
4. What are the implications of inadequate legal solutions, frequent changes in laws and lack of updated translations of IAS/IFRS for the quality of financial statements, costs of their preparation and the public perception of the accounting profession?

Our intention is to examine the issue of the financial reporting quality by means of empirical research, i.e. from a completely new perspective in relation to the theoretical criticism from academic researchers or apologetic attitudes of regulators. Therefore, we think that the analysis of the attitudes of professional accountants, who are directly tasked with the application of the imposed accounting regulations, is of considerable importance.

Key determinants of the quality of financial reporting

The quality of financial reporting has attracted a great deal of attention, especially in developed countries, which points to the awareness of the importance of accounting information to various individual interest groups in the private and public sector, but also to the national economy as a whole. Given the aforementioned, it comes as no surprise that the accounting profession is highly positioned in the economy and society. Unfortunately, the examples of high-quality financial reporting are rarely noticed outside the accounting profession. But, when there is a lack of quality financial reporting and when its consequences become visible, then the problem of the quality goes far beyond the scope of the accounting profession. In such circumstances, investors and other stakeholders, capital market, financial system and national economy are likely to suffer serious

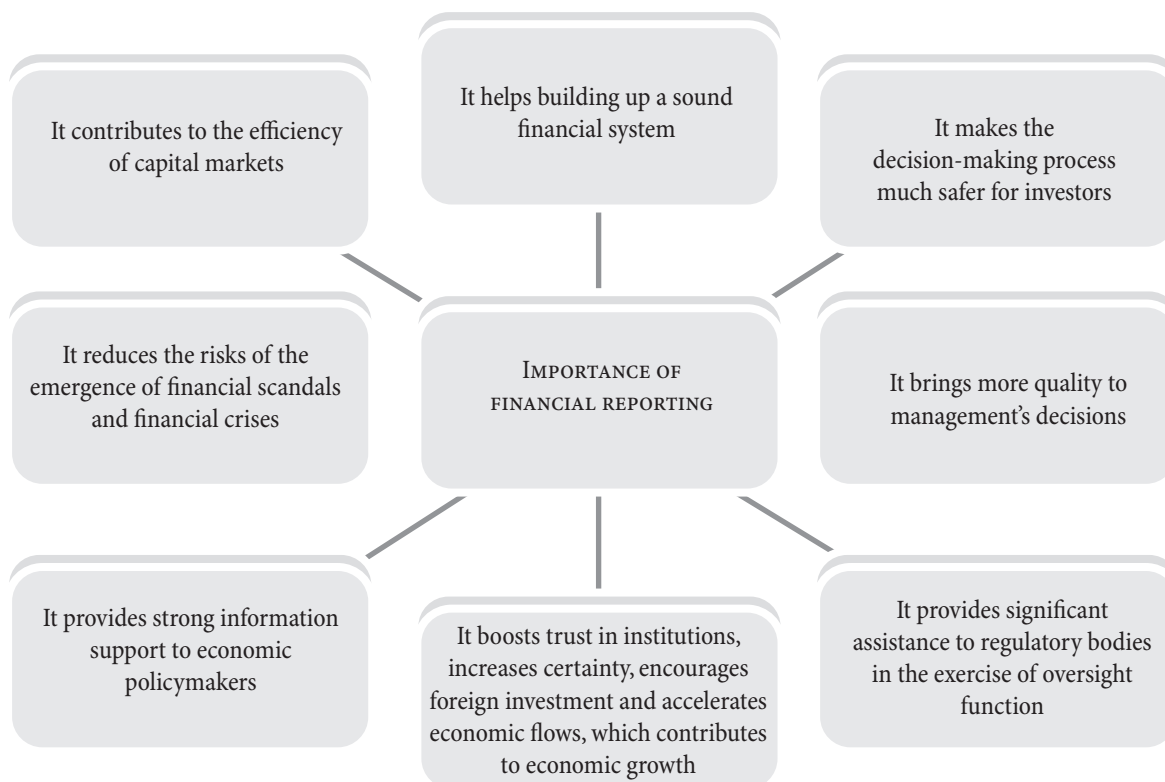
damage.¹ Restoring the lost credibility of the accounting profession is a challenging and costly process.

The importance of financial reporting stems from the underlying objectives of this system. According to the conceptual framework: “The objective of general purpose financial reporting is to provide financial information about the reporting entity that is useful to existing and potential investors, lenders and other creditors in making decisions about providing resources to the entity. Those decisions involve buying, selling or holding equity and debt instruments, and providing or settling loans and other forms of credit” [4, p. 8]. Given the significance of the reporting entities for the functioning of the national economy, it becomes clear that the role of financial reporting surpasses the explicitly enumerated interests of capital providers. A lack of trust in the process of financial reporting jeopardizes the functioning of the capital market, threatens the financial system stability, increases risks and the cost of capital, and erodes the growth of companies, sectors and the national economy as a whole. Simply put, financial reporting is a prerequisite for an efficient functioning of the market economy. The main effects of financial reporting are systematized in Figure 1.

Figure 1 can at least give us some insight into the importance of financial reporting, which today no one calls into question. “Investing and lending, particularly in the private sector, is a vital part of national wealth creation. In the public sector, governments and donors want to be sure that the money they provide is used for its intended purpose. In both sectors, good financial information and professional ethical standards help to reduce the likelihood for corruption and improve governance, and therefore make more money available for poverty reduction” [5, p. 6]. Poor-quality financial reporting leaves the legacy of the investors’ mistrust in the institutional mechanisms that are supposed to enable the development of an efficient financial reporting

1 For example, the loss in market capitalization incurred due to fraudulent financial statements of the companies WorldCom, Quest, Tyco and Global Crossing was estimated at around USD 460 billion, of which the bankruptcy of only one company, i.e. WorldCom, triggered a loss of USD 175 billion and 60,000 jobs in 65 countries, while the pension funds were left with worthless stocks, despite the fact that their value once had amounted to USD 25 billion. For more details, see: [11, p.278].

Figure 1: The importance of financial reporting



system, which results in a drop in economic growth. The essence of financial reporting is most vividly described by the words of Martin Gruell, CFO and a member of the Management Board, Raiffeisen Bank International AG: “No transparency, no trust → no trust, no credit → no credit, no investment → no investment, no growth! There is a simple logic: corporate governance and financial reporting are an essential building block for financial intermediation, foreign investment, and sustainable economic development.” The role of high-quality financial reporting in the mitigation of information asymmetry, the development of capital markets, the financial system stability and the functioning of regulatory bodies is quite obvious, so there is no need for further elaboration.

With a view to gaining a better understanding of the essence of accounting information, it is important to emphasize that this type of information is quite specific in comparison to other business information. Its specificity comes from its regularity (in terms of regularity of reporting), its public character (in terms of public availability), and the consequent public accountability of all participants in the chain of financial reporting for the

protection of public interests. All those who rely on the information provided in financial statements are expecting impartiality, honesty, integrity and professional conduct from the parties responsible for ensuring the quality of this system. Protection of the public interest must be given the highest priority in this field [8, pp. 18-20].

Unfortunately, not all the participants in the chain of financial reporting have the same sense of responsibility when it comes to the creation of necessary preconditions for the development of a high-quality financial reporting system. Insufficient understanding of the root of the problem due to a lack of competence of those responsible for the financial reporting quality and the supremacy of interest groups that reap benefits from a poor-quality financial reporting, pose a serious threat to the quality of financial reporting. Of course, this is especially true of underdeveloped countries that do not have sufficiently developed capital markets, stable regulatory framework and well-established institutions. Besides, if we take into account a widespread adverse selection in the field of human resources in institutions which make an integral part of the chain of financial reporting, then the risks become even more apparent.

Financial reporting system is an integral part of the financial infrastructure of every economy, and as such, it contributes significantly to the development of sound national and international financial systems. However, a financial reporting system has its own infrastructure which determines its quality. In this regard, it is advisable to follow the examples of best practice applied in the countries with a rich accounting tradition. Accordingly, we have decided to present the infrastructure of financial reporting quality that consists of six pillars (Figure 2), defined in IFAC’s document “Tools and resources to support the development of the accounting profession” [5, p. 14].

All of these pillars must be equally strong in order to preserve public confidence in financial statements. If any of them becomes weaker, then the financial reporting system is compromised and the risks for users of accounting information increase. Given that the subject matter of our paper is primarily related to the legal and professional accounting regulations, the main emphasis will be on the first two pillars.

The state (specifically, the government as a holder of executive power) has a key role in establishing high-quality financial reporting system. The government has the legislative power which allows it to set up the initial strategic framework that may stimulate or inhibit the development of high-quality financial reporting. The legislative power entails the ability to establish the key determinants, such as the standardization of normative base (the choice between regional and global regulations and national accounting regulations), establishment of public oversight bodies, definition of the legal status of professional organizations, selection of the criteria for the

classification of entities and the alignment of reporting requirements with those criteria, mandatory audit, mandatory certification of professional accountants, mandatory continuing professional education and the like. Moreover, in order to create the environment that would discourage creative and dishonest accounting and promote high-quality financial reporting, the government has to cultivate good relationships with professional accounting associations with the aim of achieving synergetic effects in the process of improving the financial reporting quality.

Nowadays, no country should lose sight of the global trends that shape the development of financial reporting system. These trends primarily refer to: the globalization of markets for goods, services and capital which creates the need for the adoption of international financial reporting regulations; a global shift from a traditional toward a knowledge-based economy due to which the financial reporting model tends to converge to the operational reporting model that also requires non-financial information; a growing insistence on the reporting on the corporate social responsibility, which implies the need for extended financial statements; and a greater responsibility of the state in the area of financial reporting, with a special focus on the protection of the public interest. In this regard, we must point out that wrong key legal solutions have an irreversible character and lead to adverse effects in the long term. It is certain that the weakening of this pillar can practically destroy the entire construction of the financial reporting quality.

The second pillar of the quality relates to the application of internationally comparable financial reporting standards. A strategic approach in the process

Figure 2: Pillars of financial reporting quality



of providing high-quality and internationally comparable financial reporting system requires a firm reliance on regional (the EU Directives) and global regulations (IFRS and IFRS for SMEs). Geographical position in Europe and political commitment to EU integration are imposing the compliance with the standards of conduct in place within this regional community, which also relates to the field of financial reporting.

However, global professional regulations have gained momentum to such a large extent that they cannot be ignored on regional or national level. The process of harmonization of professional and legal accounting regulations mainly involves the rejection of some national solutions and the adoption of global ones. More precisely, we refer to the application of the International Financial Reporting Standards (IFRS) and the International Financial Reporting Standards for Small and Medium-Sized Enterprises (IFRS for SMEs). Leaving aside the scope of their application, we must emphasize that the very adoption of international financial reporting standards brings numerous benefits, such as:

- International reporting standards reflect the world's best practice in this field and, accordingly, they are certainly far more efficient than the national standards, which usually cannot be properly implemented in underdeveloped countries due to a lack of capacity;
- Availability of financial statements that are comparable and understandable to investors reduces their preparation costs, ensures a greater transparency in the capital markets, reduces the risk of adverse selection, and increases certainty for investors, which contributes to a more efficient allocation of capital;
- Financial statements prepared in compliance with international standards help foreign investors to assess risks more efficiently as well as to make better decisions, which streamlines the inflows of FDI and portfolio investment;
- Transparent financial reporting contributes to the development of the domestic capital market, which helps companies gain a better access to sources of funding, improve their competitiveness in the financial market and reduce the cost of capital;

- By applying international standards, companies can more easily access the global capital markets in order to find the most affordable sources of funding;²
- The application of international standards keeps different interest groups from lobbying for the inconsistent application of financial reporting standards. In this manner, it protects the independence and credibility of the accounting profession and prevents the potential abuses that give rise to creative accounting, which definitely enhances the second pillar of financial reporting quality;
- As far as the current setting in the RS is concerned, the application of international standards in business practice is to enable the harmonization of accounting practice with the education of accountants at the country's leading universities, which certainly contributes to a higher quality of services provided by professional accountants.

Considering the foregoing facts, it does not come as a surprise that the vision of global accounting standards has been publicly supported by relevant international institutions, such as the G20, World Bank (WB), International Monetary Fund (IMF), Basel Committee on Banking Supervision (BCBS), International Organization of Securities Commissions (IOSCO), and International Federation of Accountants (IFAC).³ Excluding the jurisdictions that permit or require the application of IFRS standards and IAS standards for at least some entities and those which are undergoing the process of transition to IFRS/IAS (24 jurisdictions), "...119 jurisdictions require IFRS Standards for all or most domestic publicly accountable entities (listed companies and financial institutions) in their capital markets" [10, p. 28]. On the basis of a thorough analysis of the results of almost 100 academic studies, it can be concluded that the majority of research studies "provide evidence that IFRS Standards have improved efficiency of capital market operations and promoted cross-border investment" [14].

² Organization for Economic Co-operation and Development (OECD) estimates that worldwide Foreign Direct Investment (FDI) outflows in 2014 were US\$1.415 trillion. The historically highest level was in 2007 (US\$2.447 trillion) [16].

³ For more details, see: [15].

To provide a better insight into the worldwide acceptance of international accounting standards, we will illustrate the situation in this area in 2010 in Figure 3.

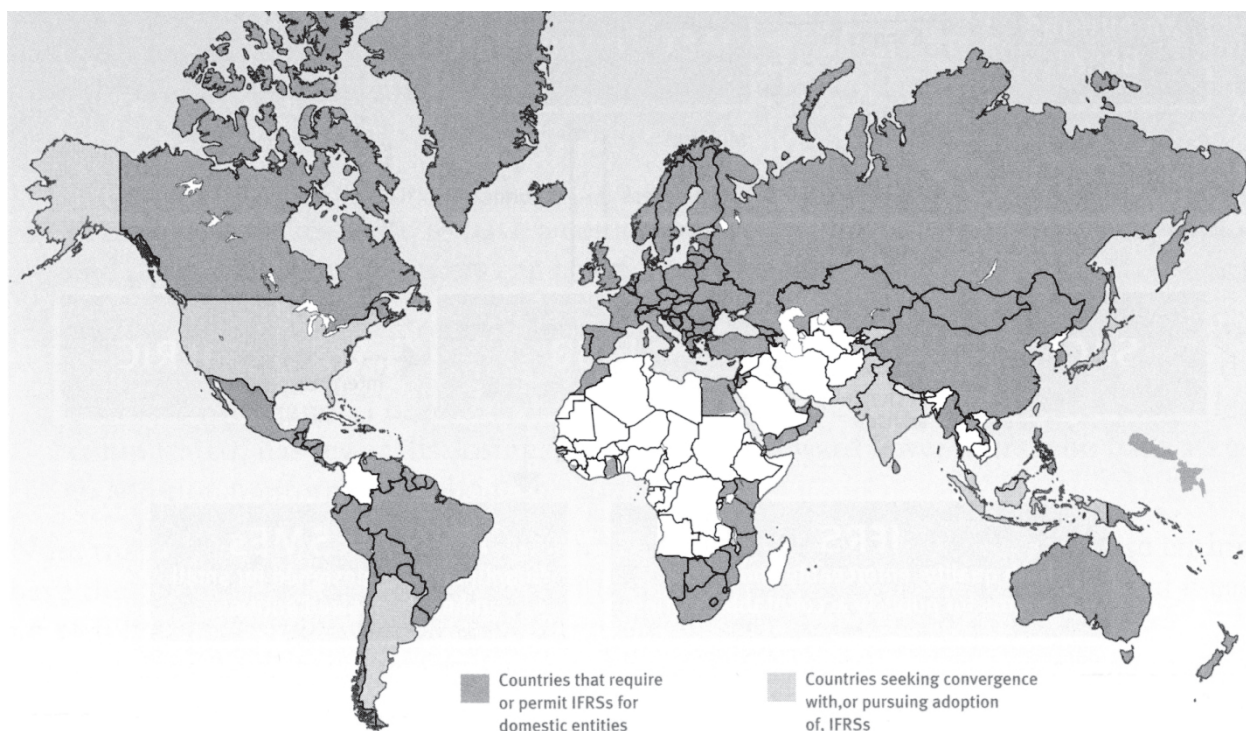
Today, there are several relevant international institutions that deal with the issues of harmonization and promotion of international accounting standards. The most important among them are: International Accounting Standards Board (IASB), Commission of the European Union (EU), International Organization of Securities Commissions (IOSCO), International Federation of Accountants (IFAC), United Nations Intergovernmental Working Group of Experts on International Standards of Accounting and Reporting (ISAR), a part of United Nations Conference on Trade and Development (UNCTAD) and Organization for Economic Cooperation and Development Working Group on Accounting Standards (OECD Working Group) [1, pp. 250-276]. Besides, we should also mention the efforts toward the convergence of IFRS with US and Japanese GAAP [12, pp. 104-105]. One of the main objectives is to eliminate regulatory barriers to international capital flows. In such circumstances, for the countries like Serbia there is no dilemma about whether to apply the international professional standards or not, but how to

do so. Otherwise, the fragility of the second pillar might trigger the collapse of the entire infrastructure.

The other pillars of financial reporting are equally important. The application of auditing standards (the third pillar) is aimed at building confidence of the existing and potential investors in information contained in financial statements. More confidence contributes to greater certainty for investors and energizes the processes in capital markets. A greater level of investment fosters economic growth and employment.

The accounting profession (the fourth pillar) is highly positioned in the society, among other things, as a result of the fact that professional accountants, who serve the public interest, take part in public practice as business accountants, public sector accountants, auditors in the private and public sector, and consultants. The accounting profession has a considerable role in the following areas: harmonization of national accounting practice with international best practice of financial reporting, promotion of professional practice, promotion of ethical behavior and implementation of the Code of Ethics, continuing education, the certification of accountants and auditors, development of the quality assurance programs and

Figure 3: Countries that allow or use IFRS or are seeking convergence



Source: [6, p. 16]

members' interests protection programs, promotion of the development of accounting profession and professional conduct of accountants, etc.

Given the changes in the structure of the economy, the existence of numerous and very complex transactions as well as increased demands in terms of the scope of financial reporting, it is evident that the education and training of professional accountants (the fifth pillar) are key to maintaining the quality of financial reporting. We should not lose sight of the fact that the accountability of professional accountants is directly related to the implementation of accounting regulations in a legal and ethically acceptable manner, the protection of interests of all stakeholders of a company against the consequences of financial scandals, more efficient and effective use of scarce resources in the public sector, the championship of anti-fraud and anti-corruption behavior in the public sector for the sake of a better protection of citizens' rights, etc. By strengthening confidence in the financial reporting system, professional accountants encourage investors to new investment and invigorate processes in the capital market as well as the growth of individual entities and the national economy. Maintaining the required level of competence of professional accountants is not possible without continuing professional development.

Finally, monitoring and enforcement (the sixth pillar) should ensure the desired level of security and the highest level of compliance with the adopted regulations in the field of financial reporting. In addition to the public authorities, the regulatory bodies such as the central bank or the securities commission, which are in charge of some financial entities, also have significant roles in these processes. However, it is particularly important to emphasize the role of public oversight bodies which, through efficient monitoring of accounting and auditing practices, should contribute to maintaining and improving the quality of financial reporting system.

Unfortunately, more thorough elaboration of the last four pillars is beyond the scope of this paper. In the next sections of the paper, we will focus on the legal and professional accounting regulations or, more precisely, on the parties responsible for the establishment and strengthening of the first two pillars, as well as on the

results of the empirical research on the quality of financial reporting in the Republic of Serbia.

Accountability for the financial reporting quality in the RS

The fundamental lack of understanding of the significance of financial reporting in the RS has resulted in its reduction to a formal obligation of submitting financial statements no later than the expiration day of a deadline specified by the law, without serious consideration of their structure, substance or their comparability with their equivalents in advanced economies [9]. The completion of the regulatory framework of financial reporting has not been possible due to a constant ignorance of international practice, numerous flaws in the existing regulations, bad decisions in terms of certain legal solutions, as well as a blatant disregard for the institutions that are supposed to monitor the financial reporting quality. Bearing in mind that the state holds the legislative power, it is obvious that it is the most responsible for the current situation, because it has not always had a clear vision of the development in this field, which would be followed by other actors in the pyramid of responsibility of financial reporting. Here we primarily refer to the national regulatory bodies, professional organizations, and the independent public oversight bodies. Naturally, if we move down to the level of a company, the actors who cannot escape the responsibility include managers, audit committees, but also professional accountants and auditors.

Setting up a long-term sustainable system in the RS has failed due to the fact that the state, which bears the greatest responsibility for the financial reporting quality, has not seriously realized the fact that there is no appropriate alternative to the harmonization of financial reporting at the global level. Instead, there have been attempts to delay or slow down the efforts in this direction by claiming, among other things, that the RS is still in the process of transition, and that some "more important" issues need to be addressed before the regulation of financial reporting can take place. Consequently, the issue of the harmonization of financial reporting has, consciously or unconsciously, remained on the sidelines of the whole process without

any serious analysis of the effects of such a situation. The presence of international institutions contributes to keeping this process open, but there is no sign of a decisive step toward the convergence of the financial reporting system with the standards applied in the countries from which the consultants come, mainly due to the reluctance of the state to replace certain national solutions with the generally accepted global standards.

Despite a clearly expressed need for the application of full IFRS/IAS in the recent versions of the Law on Accounting, the compliance is only partial, both in terms of the categories of taxpayers and the actual application of standards. Translations of all standards are not yet available, while the versions of available translations are often incompatible with the current IASB versions of standards. The lack of full compliance is a result of the absence of a clear division of responsibilities for the translation of standards, inefficiency in translating, as well as the delays in the implementation of international professional regulations. The process of harmonization with international regulations has been additionally hampered by some parts of the national regulations, particularly by the Rulebook on the manner of recognition, measurement, presentation and disclosure of items in the individual statements of micro and other legal entities (which relates to almost 90% of legal entities whose financial statements are processed in 2015) [13], and the Regulation on budget accounting in the public sector, unfamiliar to the practices of the countries in which the financial reporting is put on a well-deserved pedestal.

Serbia's efforts to become a member of the European Union (EU) have further strengthened the need for the harmonization of financial reporting, but also made it more difficult to achieve. In fact, this commitment has posed an additional challenge for regulators, i.e. the harmonization of the financial reporting system with EU regulations. The existing differences between global professional regulations and EU regulations have brought about further confusion. Although the differences are not insurmountable, the disorientation of lawmakers in this process has led to the fact that the existing Law on Accounting does not comply with the Directive 2013/34/

EU3 [2], which was passed in the same year as the Law on Accounting.

Frequent changes in legislation continually create instability of national regulations of financial reporting, thus exposing the users of accounting information to unnecessary risks and the business entities to unnecessary and high costs, which could be largely avoided. In fact, over the last 20 years, more precisely, from 1993 to 2013, five laws on accounting were passed, the last of which practically derogated the financial reporting system by prescribing, among other things, formally and essentially, incomparable forms of financial statements. These laws often proposed the solutions which are theoretically unknown and/or abandoned long ago by the developed countries, which we publicly embrace as our "role models". Therefore, we should not be surprised by a recent assessment by the European Commission which suggests that further efforts are needed to achieve compliance of the national regulations with the aforementioned EU Directive from 2013 [3].

Owing to the forgoing facts, the form and substance of the existing financial statements, as the main sources of publicly available information on the financial position, performance and changes in the financial position, are not compliant with IFRS/IAS or EU directives on accounting. What is worse, even their theoretical basis could be questioned, which particularly applies to the existing form of Income Statement.⁴ This fact speaks volumes about our progress at the moment, although there were a few relatively successful years in which we somehow managed to bring our financial statement forms closer to good business practice and, after a long period of time, make them transparent and readable to users. But, with the latest "innovated" schemes of financial statements, we returned several decades back, thus causing direct damage to the users of accounting information who, due to the clumsy decisions of the main regulator, cannot make the comparisons of performance across time and space, in the absence of which it is impossible to perform any serious analysis that lies at the core of many operational and strategic decisions of key stakeholders.

4 Detailed elaboration of these problems is beyond the scope of this paper, for more information see: [7, pp 30-59]

The problem of the absence of more decisive harmonization of the financial reporting system in the RS is also a result of weak institutions lacking the required level of independence and competence, with seriously damaged credibility among the accounting professionals and the general public. This situation is largely due to the fact that these institutions have been inadequately established from the very beginning, and therefore often dysfunctional and dependent on political structures. For example, the core business of the Public Audit Oversight Board and the National Commission for Accounting should be the development and care of the quality of financial reporting system. However, the Public Audit Oversight Board was in fact institutionalized as a public authority and its independence is compromised beforehand. Besides, the Board does not have adequate powers or necessary infrastructure, it is deprived of the most important instruments by means of which it could act, since its technical assistance is provided by the Chamber of Auditors, being itself the subject to control. Furthermore, the existence of the National Commission for Accounting is essentially insignificant if its statutory responsibilities and accountability are legally derogated and lack strict and predefined criteria that can ensure competent membership and independent work of this important regulator of financial reporting. In addition, there is a need for the Securities Commission to be more actively involved in the creation of legal and professional regulations in order to fulfill the financial reporting requirements placed upon participants in the capital market. Good examples of the commitment to the development of financial reporting are the International Organization of Securities Commissions (IOSCO) and the US Securities and Exchange Commission (SEC).

Disunity and lack of coordination among institutions only deepen the listed problems. When selective appreciation of the key actors in the process of financial reporting is added, then it becomes clear how much this situation is unsustainable, and that such destructive environment cannot provide fertile ground for the improvement of the quality of financial statements.

By enabling the total liberalization of the accounting services market which allows that anybody, regardless of

education, can provide the accounting services in the RS, the main regulator has made it clear how much it cares about the quality of financial reporting system. At the same time, the process of certification of professional accountants has for decades been unnecessarily complicated and departed from its main purpose, i.e. the continuous improvement of the quality of the accounting and auditing profession. Besides, if we take into account the complete liberalization of higher education and formal equalization of diplomas without scrutinizing the substantive content of the curricula, we can see to what extent the financial reporting system has been damaged. Everywhere in the world there is a positive selection in the professions of public interest, and it is usually entrusted to the institutions which are truly independent and have a very long tradition. The same steps should have been taken in the RS a long time ago in order to create reliable mechanisms that would be able to keep away from accounting practice all those who violate the laws and disregard the ethical standards of the profession.

Assessment of the quality of legal and professional regulations of financial reporting in the Republic of Serbia: Empirical findings

Based on the empirical research involving 583 professional accountants, in this part of the paper we will analyze their attitudes toward the quality of legal and professional regulations of financial reporting. We will examine whether these attitudes are influenced by the work experience of professional accountants, the nature of business activity performed by their employer, the size of the employer and its legal form. In the end, we will calculate the so-called quality score of the legal and professional regulations, which takes values from 0 to 1, with the values closer to zero indicating a low quality of the relevant regulations.

Methodological framework of the research

Before we present the empirical findings, let us first describe the sample and applied research methods. The research is based on the data collected by the Serbian Association of Accountants and Auditors after conducting a survey among professional accountants in the second half of June,

2016. The questionnaire was completed by 583 members of the accounting profession. Some of them are employed in companies and financial institutions, while others are employed in accounting agencies. The accountants who participated in the survey are employed in entities of different sizes and legal forms, and they have different levels of work experience. The questionnaire was filled out directly in the field in most cities (Subotica, Niš, Požarevac, Pirot, Sremska Mitrovica, Vršac, Novi Sad, Sombor, Kragujevac, Pančevo, Bačka Palanka, Zrenjanin, Novi Sad, Belgrade, Kruševac and Kikinda), but also in electronic form available on the website of SAAA. All of the aforementioned facts point to a satisfactory representativeness of the collected data and samples, which has a positive impact on the relevance of the empirical findings. Description of the sample is provided in Figure 4.

It can be seen that the sample consists mainly of professional accountants with more than 10 years of

work experience, which also contributes to the relevance of obtained empirical findings. Most of the respondents are employed in companies or financial institutions. Their employer is most often a microenterprise, and the prevailing legal form of the employer within the sample is a limited liability company.

The questionnaire, which was created by the Serbian Association of Accountants and Auditors, includes 31 closed questions. The questions relate to the quality of financial reporting in the RS. The response to each question is graded using a five-point Likert scale (1 – completely disagree, 2 – disagree, 3 – slightly agree, 4 – mostly agree, 5 – completely agree).

The subject of the analysis in this paper does not cover all the questions contained in the questionnaire, but only those listed in Table 1. These questions are aimed at assessing the attitudes of professional accountants toward the quality of legal and professional regulations in the area

Figure 4: Description of the sample

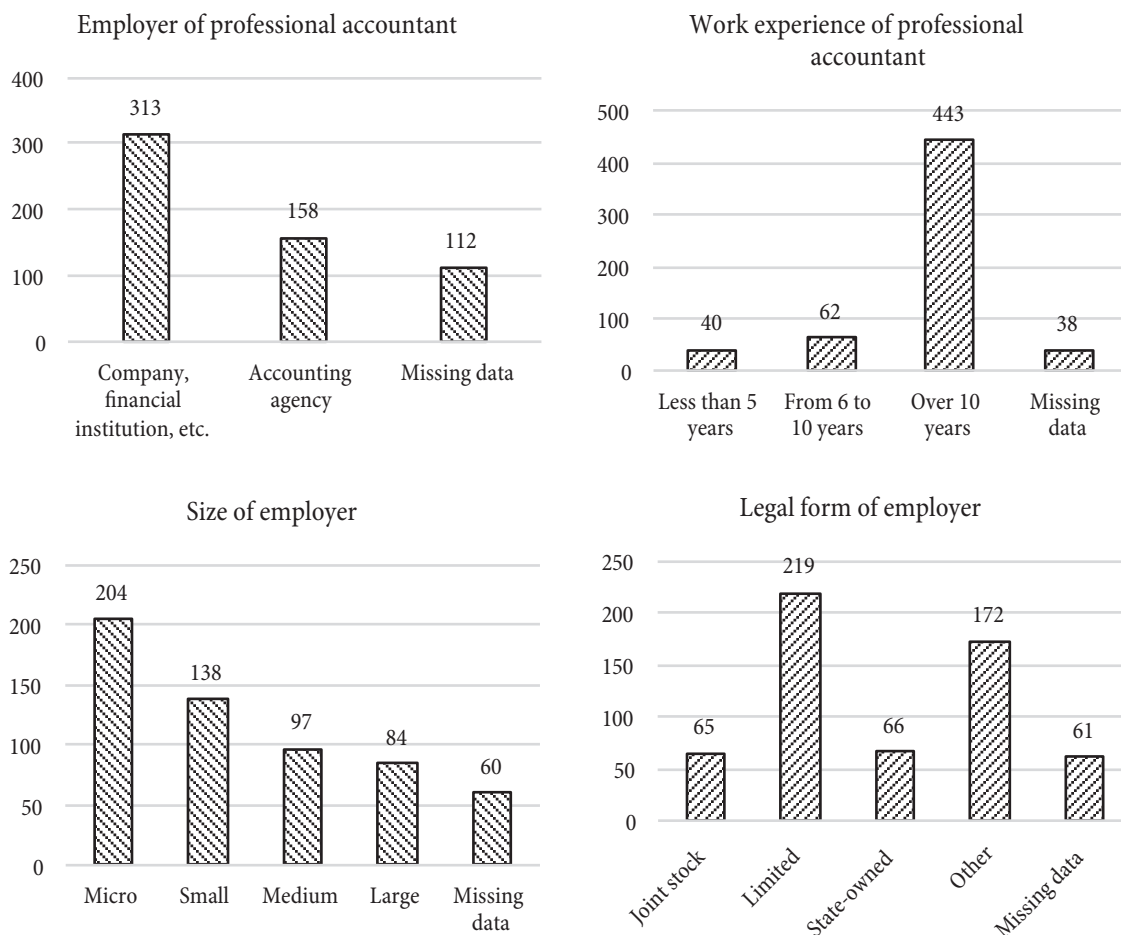


Table 1: Attitudes of professional accountants toward the quality of legal and professional regulations of financial reporting in the RS

Statements	Frequency distribution of responses					
	Completely disagree	Disagree	Slightly agree	Mostly agree	Completely agree	Missing data
	1	2	3	4	5	
1. Poor legislative solutions have led to the deterioration of accounting and accountancy profession, and endangered public interest.	1	5	44	79	439	15
2. Frequent changes in the Law on Accounting (and audit) increase the costs of financial reporting for reporting entities and all users.	1	8	50	98	401	25
3. Implementation of IFRS and IFRS for SMEs requires stable and quality professional regulations (without frequent changes).	1	6	50	86	418	22
4. A high number of measurement bases does not contribute to the reliability of reporting, while it increases cost and demands more effort from the accountant.	3	17	84	134	309	36
5. The lack of updated translations of IFRS, IFRS for SMEs and supporting regulations hinders the quality work of accountants and auditors.	2	20	84	125	321	31
6. The application of IAS/IFRS increases comparability of information on national, regional and international level.	10	16	76	118	320	43
7. The application of IAS/IFRS increases competitiveness of the companies that want to do business on foreign markets.	12	15	78	126	310	42
8. The application of IAS/IFRS helps state bodies, government agencies and companies attract foreign investments.	15	24	87	139	274	44
9. The application of IAS/IFRS and supporting regulations increases the trust of foreign investors and the quality of financial reporting.	14	17	84	147	281	40
10. All entities, regardless of their classification, should be allowed to apply full IFRS, which would result in the decrease of the amount of work, number of mistakes, costs of transition from one category of classification to another, and costs of consolidation.	12	29	97	111	302	32
11. The rulebook for the valuation of items for micro and other entities does not provide all the necessary information for the recording of operational changes, without the usage of IFRS for SMEs.	10	33	133	141	215	51
12. Since the IFRS for SMEs is in use, there is no need for the special rulebook for micro and other entities.	25	39	106	125	237	51
13. The existence of 13 charts of accounts makes it more difficult for the accountant to do his or her job, because the balance sheet positions in all entities have the same essence and terms of recognition.	3	9	45	92	398	36
14. The existing financial statement forms, because they are too big and contain errors, do not serve their purpose.	3	38	94	121	290	37
15. If the scope of financial statements was decreased, there would no longer be a need for special forms of financial statements for particular reporting entities.	5	33	83	136	289	37

Source: [9]

of financial reporting in the RS. There are 15 questions. Table 1 also shows frequency distribution of the responses to these questions given by professional accountants.

The processing and analysis of the obtained responses were carried out by applying the methods of descriptive statistics and the methods of statistical hypotheses testing. Besides parametric methods, the second group also involved the use of appropriate non-parametric methods

that are based on less strict assumptions about the type and distribution of analyzed data. Namely, non-parametric tests, such as the Wilcoxon-Mann-Whitney test or the Kruskal-Wallis test, could be used not only for analyzing interval data but also for ordinal data, which may not be normally distributed. There is no doubt that the character of information which is obtained using the Likert-type scale in rating responses tends to be ordinal rather than

interval. As a result of the fact that there are a growing number of authors that treat such data as quasi-interval, in this paper we also apply the parametric methods like the t-test and the one-way ANOVA.

The results of descriptive statistics

The results of descriptive statistics analysis of the professional accountants' responses to the above-mentioned 15 questions are displayed in Table 2. The table contains the measures of central tendency (mean, median and mode), the measures of dispersion of the obtained responses (standard deviation and interquartile range), as well as the coefficients of skewness and kurtosis relative to distributions of those responses.

It can be clearly seen that all distributions are negatively skewed ($\text{skewness} < 0$). The mean of the responses to each of 15 questions is lower than the median, which is lower or equal to the mode. The mode values indicate that professional accountants in most cases completely agree with the statements on the quality of legal and professional regulations formulated in the questionnaire. The value of the median is 4 (they mostly agree with the statements) or 5 (they completely agree with the statements), while the mean ranges from 3.96 to 4.67. Dispersion of responses is not considerable. Standard deviation varies from 0.67 to 1.17, while the interquartile range varies between the levels

0 and 2 on the Likert scale. Besides, it is also noticeable that most of the distributions are leptokurtic ($\text{kurtosis} > 3$), except the distributions of the responses to the questions 11, 12 and 14, which are platykurtic ($\text{kurtosis} < 3$). Higher kurtosis entails a larger grouping of data around the mean and, consequently, a lower standard deviation.

What conclusions about the quality of legal and professional regulations of financial reporting could be drawn based on the presented results of descriptive statistics analysis of the professional accountants' responses? These conclusions could be systematized as follows:

1. The application of IAS/IFRS increases the comparability of accounting information released by domestic and foreign companies. On the one hand, it contributes to increased competitiveness of domestic companies on foreign markets and, on the other, it makes it easier for the public authorities to attract foreign investment, since it builds the foreign investors' trust in the quality of financial reporting. These conclusions are based on the results of descriptive statistical analysis of the responses to the questions 6, 7, 8 and 9. The means associated with the responses to these questions do not fall below 4.17, while the values of median and mode are equal to 5 (complete agreement). At the same time, the responses are not significantly dispersed.

Table 2: Descriptive statistics

Statements	Mean	Median	Mode	Standard deviation	Interquartile range	Skewness	Kurtosis
1.	4.67	5	5	0.67	0	-2.10	7.00
2.	4.59	5	5	0.73	1	-1.79	5.64
3.	4.63	5	5	0.71	1	-1.90	6.01
4.	4.33	5	5	0.88	1	-1.16	3.60
5.	4.35	5	5	0.89	1	-1.17	3.45
6.	4.34	5	5	0.95	1	-1.44	4.58
7.	4.31	5	5	0.97	1	-1.42	4.58
8.	4.17	5	5	1.03	1	-1.20	3.83
9.	4.22	5	5	0.99	1	-1.29	4.25
10.	4.20	5	5	1.05	2	-1.15	3.46
11.	3.97	4	5	1.04	2	-0.69	2.69
12.	3.96	4	5	1.17	2	-0.91	2.91
13.	4.60	5	5	0.76	1	-2.01	6.89
14.	4.20	5	5	1.00	1	-0.97	2.85
15.	4.23	5	5	0.98	1	-1.10	3.33

Standard deviations do not exceed 1.03, and interquartile ranges are equal to the level 1 on the Likert scale.

2. The existence of 13 charts of accounts, cumbersome financial statement forms and a large number of normative bases for the valuation of balance sheet items make it more difficult for the professional accountants to do their job, increase the costs of financial reporting and undermine the quality of financial statements (the questions 4, 13, 14 and 15). The mean calculated for the responses to each of these questions does not fall below 4.20, while the median and the mode are equal to 5 (complete agreement). Moreover, the dispersion of responses is not large. Standard deviations do not exceed 1, and interquartile ranges are equal to the level 1 on the Likert scale.
3. All entities, regardless of their size, should be allowed to apply full IFRS, which would decrease workload, number of errors, and costs of the consolidation of financial statements or the transition of an entity from one category of classification to another. There is no need for a special rulebook on the manner of recognition, valuation, presentation and disclosure of items in the financial statements for micro entities. These conclusions are based on the results of descriptive statistical analysis of the responses to the questions 10, 11 and 12. For each of these questions the mode is 5 (complete agreement), the median is at least 4 (agreement to a great extent), and the value of the mean is around 4. Variability of responses is slightly larger in comparison to the previous cases. Standard deviations exceed 1, while interquartile ranges are equal to 2.
4. Poor quality legislation, frequent changes in laws and inadequate translation of IFRS lead to increased costs of financial reporting and adversely affect the application of IAS/IFRS, the quality of financial statements, and the public perception of the accounting profession (questions: 1, 2, 3 and 5). The means of the responses to these questions are greater than 4.34, and the values of the median and the mode are equal to 5 (complete agreement).

Variability of responses is low. Standard deviations are below 1, while the interquartile ranges are equal to 0 or 1.

As we can see, professional accountants positively evaluate the quality of professional regulations inherent in IAS/IFRS. The problem is caused by the solutions imposed by laws and bylaws that have failed to ensure the efficient implementation of professional regulations. They are unstable and subject to frequent changes. Also, these solutions allow the circumvention of IFRS and IFRS for SMEs by the so-called microenterprises which, according to the data from 2015, make up 89% of the total number of enterprises in the RS [13]. Besides, their share in the total number of employees, assets and income of the economy at the end of 2015 amounted to 22%, 19% and 12%, respectively [13]. So, the existing regulatory framework allows a significant part of economic activities to be recorded without complying with IAS/IFRS, which is considered to be one of its major flaws.

Conformity in professional accountants' attitudes toward the quality of legal and professional regulations of financial reporting in the Republic of Serbia

In this section we will examine whether the different groups of professional accountants share the same attitudes toward the quality of legal and professional regulations of financial reporting in the RS. Are such attitudes influenced by the work experience of professional accountants, the nature of business activity by their employer (provision of accounting services vs. manufacturing, retailing or finance), the size of the employer (small, medium-sized or large enterprise) or its legal form (joint stock company, limited liability company, state-owned company or other legal forms)? To what extent are the attitudes across the accounting profession compact, stable and uniform? Do different groups of professional accountants have different opinions on the quality of regulatory framework in the field of financial reporting? The answers to these questions can be found in Table 3, which includes the results of the parametric test of equality of the means of two or more independent samples (t-test and one-way ANOVA), as well as the results of corresponding non-

parametric tests (Wilcoxon-Mann-Whitney test and Kruskal-Wallis test).

As can be seen from Table 3, the results of the two independent samples t-test and Wilcoxon-Mann-Whitney test reveal that the attitudes of professional accountants employed in accounting agencies, companies and financial institutions regarding the quality of legal and professional regulations of financial reporting converge to a great extent. The p-values are lower than the significance level of 5% only for the questions 2, 4, 13 and 14, which means that in those cases we can reject the null hypothesis of t-test about the equality of the means of two samples (professional accountants from accounting agencies vs. professional accountants from companies and financial institutions), as well as the null hypothesis of Wilcoxon-Mann-Whitney test that the samples come from the same population.

Furthermore, the results of one-way ANOVA and Kruskal-Wallis test point to a high level of conformity in the attitudes of professional accountants that have different work experience. The null hypothesis of the one-way analysis of variance (one-way ANOVA) about the equality of the means of three samples (professional

accountants with less than 5 years of work experience, professional accountants with 5-10 years of work experience and professional accountants with more than 10 years of work experience), as well as the null hypothesis of Kruskal-Wallis test, according to which the samples belong to the same population, can be rejected only when it comes to the question 15. The p-values for this question are lower than the significance level of 5%.

The one-way ANOVA has found somewhat larger differences in the attitudes among professional accountants that work in enterprises of different sizes. As the p-values are less than 5% for the questions 2, 4, 6, 10 and 13, then we can reject the null hypothesis about the equality of the means of four samples (professional accountants from microenterprises, professional accountants from small enterprises, professional accountants from medium-sized enterprises and professional accountants from large enterprises). Contrary to the one-way ANOVA, the Kruskal-Wallis test indicates the existence of differences in the attitudes of professional accountants only with regard to the question 10.

Finally, both the one-way ANOVA and Kruskal-Wallis test point to a high level of conformity in the attitudes of

Table 3: Testing of the conformity in attitudes among different groups of professional accountants toward the quality of legal and professional regulations of financial reporting in the RS

Statements	Employer				Work experience				Size of employer				Legal form of employer			
	Two independent samples t-test		Wilcoxon-Mann-Whitney test		One-way ANOVA		Kruskal-Wallis test		One-way ANOVA		Kruskal-Wallis test		One-way ANOVA		Kruskal-Wallis test	
	t statistic	p-value	z statistic	p-value	F statistic	p-value	χ^2 statistic	p-value	F statistic	p-value	χ^2 statistic	p-value	F statistic	p-value	χ^2 statistic	p-value
1.	-1.74	0.08	-1.74	0.08	0.44	0.65	0.47	0.79	2.19	0.09	4.13	0.25	0.09	0.97	0.63	0.89
2.	-3.32	0.00	-3.30	0.00	0.23	0.79	0.86	0.65	3.34	0.02	6.20	0.10	0.35	0.79	0.58	0.90
3.	-0.84	0.40	-0.89	0.38	0.39	0.67	0.61	0.74	0.34	0.80	0.18	0.98	0.29	0.84	0.81	0.85
4.	-2.38	0.02	-2.58	0.01	1.16	0.31	1.66	0.44	2.99	0.03	7.27	0.06	0.44	0.72	1.68	0.64
5.	-1.37	0.17	-1.56	0.12	0.19	0.83	1.07	0.58	0.21	0.89	0.62	0.89	0.67	0.57	0.59	0.90
6.	1.29	0.20	0.47	0.64	2.52	0.08	3.13	0.21	2.99	0.03	4.25	0.24	2.41	0.07	5.03	0.17
7.	0.83	0.41	0.45	0.65	0.61	0.54	1.02	0.60	1.46	0.22	2.88	0.41	0.84	0.47	0.82	0.84
8.	0.73	0.47	0.26	0.80	2.27	0.10	3.92	0.14	0.60	0.62	0.86	0.84	0.80	0.50	2.65	0.45
9.	1.40	0.16	0.97	0.33	0.99	0.37	1.73	0.42	1.70	0.17	3.61	0.31	0.77	0.51	2.29	0.51
10.	1.37	0.17	1.33	0.18	0.13	0.88	0.09	0.96	3.65	0.01	8.43	0.04	3.30	0.02	6.78	0.08
11.	-0.06	0.95	-0.43	0.67	1.47	0.23	3.13	0.21	0.89	0.45	1.00	0.80	0.81	0.49	2.48	0.48
12.	0.51	0.61	-0.04	0.97	0.76	0.47	0.71	0.70	1.67	0.17	2.42	0.49	1.39	0.24	2.36	0.50
13.	-1.52	0.13	-2.37	0.02	1.42	0.24	0.87	0.65	2.73	0.04	6.57	0.09	0.72	0.54	1.01	0.80
14.	-2.97	0.00	-3.48	0.00	0.51	0.60	0.36	0.83	2.39	0.07	6.85	0.08	0.81	0.49	1.67	0.64
15.	-1.33	0.18	-1.82	0.07	3.85	0.02	6.24	0.04	1.47	0.22	3.41	0.33	2.07	0.10	3.84	0.28

professional accountants employed in companies that have different legal forms (joint stock company, limited liability company, state-owned company and other legal forms). The one-way ANOVA signals the existence of certain differences in responses given by professional accountants to the question 10, while the Kruskal-Wallis test shows that there is a wide agreement on this matter among the members of the accounting profession.

Despite the findings of some of the aforementioned tests, the results of descriptive statistics, displayed in Table 4, show that the attitudes across the accounting profession are pretty much compact and uniform. This analysis covers only the questions to which, according to the results of the previous tests, the members of the accounting profession have given statistically different responses. We can observe that there are no significant differences between the means, medians, standard

deviations and interquartile ranges calculated for the responses of different groups of professional accountants to the questions 2, 4, 6, 10, 13, 14 and 15.

The fact that supports the previous observation about homogeneity and conformity in the attitudes across the accounting profession is that, at the significance level of 1%, it is possible to reject the null hypotheses of t-test and Wilcoxon-Mann-Whitney test only for the questions 2 and 14.

So, the conclusions on the quality of regulatory framework of financial reporting that have been formulated after the descriptive statistics analysis of the responses of professional accountants presented in Table 2 seem quite robust. They reflect the prevailing opinion of all groups of professional accountants, no matter how these groups are defined. There are no significant differences in opinions between professional accountants from agencies and those

Table 4: Descriptive statistics analysis of the conformity in attitudes among different groups of professional accountants toward the quality of legal and professional regulations of financial reporting in the RS

Panel A.																
Statements	Employer															
	Company, financial institution, etc.				Accounting agency											
	m1	sd2	p503	iqr4	m	sd	p50	iqr								
2.	4.51	0.80	5.00	1.00	4.75	0.57	5.00	0.00								
4.	4.27	0.91	5.00	1.00	4.49	0.82	5.00	1.00								
13.	4.60	0.71	5.00	1.00	4.71	0.72	5.00	0.00								
14.	4.10	1.00	4.00	2.00	4.39	0.96	5.00	1.00								
Panel B.																
Statements	Work experience															
	Less than 5 years				From 6 to 10 years				Over 10 years							
	m	sd	p50	iqr	m	sd	p50	iqr	m	sd	p50	iqr				
15.	3.85	1.08	4.00	2.00	4.39	0.85	5.00	1.00	4.23	0.97	5.00	1.00				
Panel C.																
Statements	Size of employer															
	Micro				Small				Medium				Large			
	m	sd	p50	iqr	m	sd	p50	iqr	m	sd	p50	iqr	m	sd	p50	iqr
2.	4.68	0.62	5.00	0.00	4.57	0.78	5.00	1.00	4.38	0.85	5.00	1.00	4.60	0.75	5.00	1.00
4.	4.45	0.80	5.00	1.00	4.32	0.93	5.00	1.00	4.16	0.93	4.00	1.00	4.17	0.97	5.00	2.00
6.	4.19	1.09	5.00	2.00	4.33	0.94	5.00	1.00	4.40	0.84	5.00	1.00	4.56	0.73	5.00	1.00
10.	4.05	1.11	4.00	2.00	4.13	1.15	5.00	2.00	4.30	0.92	5.00	1.00	4.48	0.86	5.00	1.00
13.	4.71	0.68	5.00	0.00	4.49	0.87	5.00	1.00	4.52	0.75	5.00	1.00	4.54	0.76	5.00	1.00
Panel D.																
Statements	Legal form of employer															
	Joint stock				Limited				State-owned				Other			
	m	sd	p50	iqr	m	sd	p50	iqr	m	sd	p50	iqr	m	sd	p50	iqr
10.	4.38	0.88	5.00	1.00	4.23	1.05	5.00	2.00	4.40	0.89	5.00	1.00	4.01	1.15	4.00	2.00

1 Mean

2 Standard deviation

3 Median

4 Interquartilerange

who work in the companies or financial institutions. Work experience, the size of the employer and its legal form do not have a considerable impact on the abovementioned conclusions.

Quality score of legal and professional regulations of financial reporting in the Republic of Serbia

On the basis of the available data we will also try to calculate the quality score for the legal and professional regulations of financial reporting in the RS. In this regard, we will first carry out the conversion of qualitative data into quantitative data. The response of a professional accountant i to a question j ($r_{i,j}$) is converted into an equivalent number on a scale of 1 to 5, according to the scheme which is presented at the top of Table 1. Namely, the response “Completely disagree” is converted into the number 1, while the response “Completely agree” is replaced by the number 5. Between these two attitudes, there are also three more responses which take the values of 2, 3 and 4. Missing data is replaced by the number 3, which is in the middle of a scale of 1-5.

After the quantification of responses, all the responses should be divided into two groups. The question j will belong to the group A if the response to that question, which is “Completely agree”, indicates a low quality of regulatory framework of financial reporting. Group A consists of the questions 1, 2, 3, 4, 5, 10, 11, 12, 13, 14 and 15. As far as other questions are concerned, the response “Completely agree” is an indication of a high quality of regulations. They belong to the group B.

In the next step, it is necessary to calculate the quality score of legal and professional regulations of financial reporting for each respondent, which is done according to the following formula:

$$Quality\ score_i = \frac{\sum_{j \in A} (1 - \frac{r_{ij}-1}{4}) + \sum_{j \in B} (\frac{r_{ij}-1}{4})}{15}$$

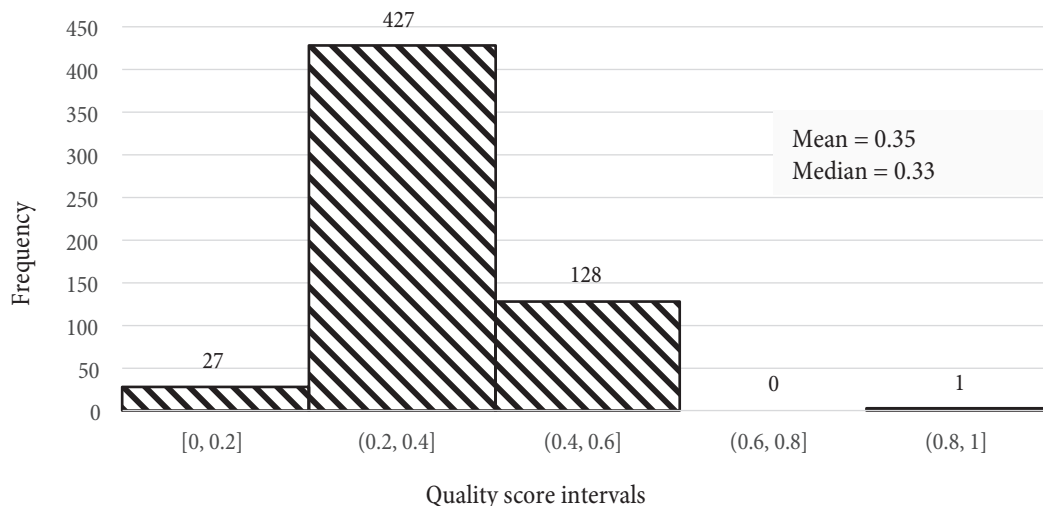
Score takes values from 0 to 1, with the values closer to zero (one) indicating a low (high) quality of regulations. Frequency distribution of the score and its mean and median are shown in Figure 5.

Figure 5 shows that the distribution is skewed to the right. The mean and the median of the score are 0.35 and 0.33, respectively. The highest value of the score is 0.8, which is attributed by only one respondent. The lowest value is zero. The score ranging from 0 to 0.2 is recorded for 27 respondents. For most surveyed professional accountants (427), the value of the score ranges between 0.2 and 0.4, which indicates that the prevailing opinion of professional accountants is that the quality of the overall regulations of financial reporting in the Republic of Serbia is poor.

Conclusion

The establishment of an appropriate infrastructure support is a prerequisite for the development of a high-quality financial reporting system. Such infrastructure support consists of six pillars of the financial reporting quality: statutory framework, accounting standards, auditing

Figure 5: Frequency distribution of the quality score of the regulatory framework of financial reporting in the RS



standards, accounting profession and ethics, education and training, and monitoring and enforcement. Each of these pillars is so important that neglecting any of them may lead to the collapse of the entire architecture aimed at reinforcing the financial reporting quality. However, if the wrong choices are made in the fields of legal and professional regulations, then the efforts made in other fields (pillars) toward achieving the required quality of financial reporting may go down the drain.

The empirical research has led to several important conclusions. Firstly, the application of IFRS/IAS increases the comparability of accounting information published by domestic and foreign companies and the certainty for investors, which helps domestic companies improve their competitiveness on foreign markets, and opens the door to more FDI. Secondly, the existence of a large number of charts of accounts (13), overly extensive content of the existing financial statement forms and a large number of normative bases for the valuation of balance sheet items complicate the work of professional accountants, increase the cost of financial reporting and adversely affect the quality of financial statements. Thirdly, all entities, regardless of their size, should be allowed to apply full IFRS/IAS or IFRS for SMEs, which would decrease the amount of work, number of errors, and the costs of the consolidation of financial statements or the transition of an entity from one category of classification to another. Fourthly, unsatisfactory legal solutions, frequent changes in laws and inadequate translation of IFRS/IAS increase the cost of financial reporting, and have negative effects on the application of IFRS/IAS, the quality of financial statements and the public perception of the accounting profession. Fifthly, there are no striking differences in the opinions between professional accountants from the accounting agencies and those working in the companies or financial institutions. Also, the factors such as work experience, the size of the employer and its legal form do not have a significant impact on the aforementioned conclusions.

The empirical research has unequivocally confirmed the prevailing opinion of professional accountants that the quality of the overall financial reporting regulations in the Republic of Serbia is at a very low level. Realistically speaking, this finding does not seem surprising. However,

it should not be regarded as a proof that the situation in the field of financial reporting in the Republic of Serbia is very bad, and that serious damage was done because the relevant institutions failed to do their job, especially in the last couple of years. This finding should primarily serve as a serious warning to those who have the authority and responsibility for the ongoing process of changing the existing regulations in the field of financial reporting. Truth be told, the very fact that the changes in the previously adopted regulations have been initiated faster than ever before is a clear signal of how not to behave when it comes to the protection of the public interest.

References

1. Choi, F., & Meek, G. (2011). *International accounting*. New Jersey: Prentice Hall.
2. Directive 2013/34/EU on the annual financial statements, consolidated financial statements and related reports of certain types of undertakings. (June 2013). *Official Journal of the European Union*.
3. European Commission. (October 2014). *Serbia progress report, accounting the document: Enlargement strategy and challenges 2014-2015*. Brussels: European Commission.
4. International Accounting Standards Board. (2010). *Conceptual framework for financial reporting*. London: IFRS Foundation.
5. International Federation of Accountants. (2010). *Tools and resources to support the development of the accounting profession*. New York: IFAC.
6. Kieso, D., Weygandt, J., Warfield, T., Young, N., & Wiecek, I. (2010). *Intermediate accounting*. Ontario: John Wiley & Sons.
7. Malinić, D. (2015). Kritički osvrt na sadržinu i strukturu zvaničnih finansijskih izveštaja. Zbornik radova: *Aktuelni problemi i perspektive računovodstva i finansija*. Savez računovođa i revizora Srbije, Zlatibor, 30-59.
8. Malinić, D. (2010). Accounting profession credibility as a factor of capital market development. *Ekonomika preduzeća*, 65(1-2), 15-28.
9. Malinić, D., Novičević, B., Malinić, S., & Stojanović, S. (2016). *Regulatory framework of accounting and the quality of financial reporting: Research study*. Belgrade: Serbian Association of Accountants and Auditors.
10. Pacter, P. (2016). *IFRS as global standards: A pocket guide*. London: IFRS Foundation.
11. Rezaee, Z. (2005). Causes, consequences, and deterrence of financial statement fraud. *Critical Perspectives on Accounting*, 16(3), 277-298.
12. Robinson, T., Henry, E., Pirie, W., & Broihahn, M. (2015). *International financial statement analysis*. New Jersey: John Wiley & Sons.
13. Serbian Business Registers Agency. (2016). *Financial statements annual bulletin - data for statistical and other purposes 2015*. Belgrade: Serbian Business Registers Agency.

14. Tarca, A. (2012). *The case for global accounting standards: Arguments and evidence*. Retrieved from <http://go.ifrs.org/Case-for-Global-Accounting-Standards>, 1-17.

15. www.ifrs.org/

16. www.oecd.org/corporate/mne/statistics.htm



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STRATEGY FOR PROVIDING EFFICIENCY IN RESOLUTION OF BUSINESS DISPUTES*

Strategija obezbeđenja efikasnosti u rešavanju
privrednih sporova

Abstract

The paper presents an overview of the most important steps of the strategy for providing efficiency in resolution of business disputes. The author examines the advantages of arbitration over state courts, provides readers with drafting considerations for arbitration agreement, analyses the procedure of selection and appointment of arbitrators, suggests tools and techniques for effective case management and explores the advantages and potential risks of fast track arbitration. The analysis is made in light of contemporary arbitration trends with special emphasis laid on the appropriate rules and best practices of the world's major arbitration institutions, endeavouring to acquaint readers with the best solutions for achieving efficiency in resolution of business disputes.

Keywords: *strategy, efficiency, arbitration, proceedings, business dispute.*

Sažetak

Predmet rada posvećen je analizi najznačajnijih koraka strategije obezbeđenja efikasnosti u rešavanju privrednih sporova. U tom smislu, autor izlaže prednosti arbitraže u odnosu na državni sud, bavi se pitanjem formulisanja arbitražnog ugovora, razmatra postupak izbora i imenovanja arbitara, sugeriše sredstva i tehnike koje treba primeniti u cilju efikasnog upravljanja postupkom i analizira prednosti i potencijalne rizike „fast track“ arbitraže. Analiza je učinjena u svetlu vladajućih tendencija u savremenom arbitražnom pravu, pri čemu je posebna pažnja posvećena odgovarajućim pravilima i praksi najznačajnijih međunarodnih arbitražnih institucija, u nastojanju da čitaocu sugeriše optimalna rešenja u pravcu postizanja efikasnosti u rešavanju privrednih sporova.

Ključne reči: *strategija, efikasnost, arbitraža, postupak, privredni spor.*

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Introduction

Non-performance of contractual obligations often results in economic losses and leads up to a dispute. This is especially significant for business contracts, which are usually more complex and often of a higher value, so the economic losses due to a breach of contract are likewise higher, involving more difficult and complex disputes. The formal requirements and sometimes unnecessary complication of the proceedings seem to be the main reason for the long duration and high cost of many disputes. For these reasons, for businesses, it is extremely important to ensure an efficient and cost-effective settlement of disputes. This can be achieved by carefully developing a strategy involving steps to be taken in the event of a dispute.

A strategy to ensure efficiency in resolution of commercial disputes needs to be developed before a dispute has arisen, already at the time of concluding a contract, bearing in mind that, once a dispute has arisen, it may be too late for planning. The first step towards developing a strategy is to determine a forum which will be in charge of resolving disputes that may arise from the contract. In that regard, parties are well advised to *select the arbitration* due to its adaptability to the needs of business community and advantages over litigation before national courts. The main prerequisite for arbitration proceedings to take place is to have a valid *agreement* by the parties to submit their current or future dispute in respect of their business transaction to arbitration. A well drafted arbitration agreement will save parties time and money by avoiding disputes over the issues related to the jurisdiction of arbitration. After a dispute has arisen, one should take into consideration that appropriate *selection and appointment of arbitrators* may speed up the dispute resolution process. Once the arbitral tribunal has been constituted, it is of crucial importance to establish the appropriate framework of the arbitral proceedings and to provide conditions for *effective case management*. There are many different tools that can be used in that respect, such as the terms of reference, the case management conference, the procedural timetable providing, among other things, for a time limit for rendering the award after the conclusion of a hearing. Finally, an expedited procedure

such as *fast track* arbitration can be an effective way to speed up the resolution of a business dispute.

The paper contains a brief overview of each particular step of the strategy in light of contemporary arbitration trends with special emphasis on the appropriate rules and best practices of the world's major arbitration institutions, endeavouring to suggest the best solutions for achieving efficiency in resolution of business disputes.

What are the advantages of arbitration over state courts?

In the past few decades, arbitration has received increased popularity and global recognition as the 'ordinary and normal method' of resolving commercial and investment disputes, in particular those of international character.¹ This is due to its adaptability to the needs of business community and its multi-faceted advantages over litigation before national courts.² One of the key advantages of arbitration over state court proceedings lies in a *more efficient, speedier and less formal* procedure. In addition, arbitration is distinguished by the following features: *neutrality of arbitrators* – the arbitrators are individuals selected by the parties, independent from national governmental and judicial hierarchy; *expertise* – settlement of disputes by arbitration is characterized by a high degree of expertise and professionalism; *party autonomy* – as one of the fundamental principles of arbitration, based on which the parties are free to establish the rules related to arbitration, including the place of arbitration, number and qualifications of arbitrators, language of the proceedings, the applicable procedural law and other details of the proceedings; for these reasons, arbitral proceedings are to a large extent tailored by the parties; *confidentiality* – arbitration hearings, as a rule, are held in private

1 According to the doctrine, "International arbitration has become the principal method of resolving disputes between States, individuals, and corporations in almost every aspect of international trade, commerce, and investment" [1, p. 1].

2 In that respect studies have shown that: a majority of users believe arbitration is better, cheaper and faster than litigation; arbitration is perceived to be a "more just process" with 80% of business people reporting that arbitration is a fair and just process; the majority of parties find arbitrators to be more likely to understand the subject of arbitration than judges; 86% of corporate counsel are satisfied with international arbitration; the rate of voluntary compliance with awards is over 90%, etc. [16].

settings and are attended only by persons designated by the parties and their counsel; *arbitral award is final and binding* – arbitration provides for a ‘one-stop shopping’, i.e. it eliminates the need for a two or three-tiered dispute resolution mechanism – an arbitral award is a final and binding decision that cannot be appealed to a higher-level court [14, pp. 238-239]; *enforcement* – arbitral award is enforceable on international level.³ It is also important to consider that arbitration can be combined with other forms of alternative dispute resolution (ADR),⁴ such as mediation, conciliation, mini-trial, expertise, neutral evaluation, etc.⁵

According to the doctrine, arbitration contributes not only to an increase of competitiveness of a business exposed to arbitration, but also adds to expansion of international trade, which subsequently positively affects the domestic market where such business is located and unburdens the judiciary [3]. On a more local level, arbitration contributes to the local economy as it generates a variety of accompanying economic activities, from use of local counsel, experts and arbitrators, to use of local legal support and venues, local hotels and restaurants [4].

In terms of comparison of arbitration with the state court, it is especially important to consider that, due to the formal and multi-tiered nature of state courts, proceedings before state courts are slower and generally last longer than arbitration proceedings. In addition, state courts generally apply strict procedural rules, and do not have the flexibility that would enable the parties to tailor the procedure that they consider suitable for their case, particularly taking into account the need for efficiency and reduction of costs. When it comes to the courts in Serbia, one should bear in mind the data from the 2016 World Bank Doing Business Survey, based on which it takes 635 days to enforce a contract before the court in Serbia at the costs amounting to 40.8% of the claim; the

trial itself lasts on average 495 days, whereas it takes 110 days to enforce a judgment [7].

Table 1: Efficiency of contract enforcement

DB 2017 Rank	61
DB 2016 Rank	53
Change in Rank	8↓
Time (days)	635
Filing and service	30
Trial and judgment	495
Enforcement of judgment	110
Cost (% of claim)	40.8
Attorney fees	14.5
Court fees	13.9
Enforcement fees	12.4

Source: [7]

Consequently, by agreeing on arbitral dispute resolution, Serbian businesses would not only avail themselves of the recourse to a faster and in most cases less costly and more efficient dispute resolution mechanism, but would also significantly contribute to enhancement of overall business climate in Serbia.

Well drafted arbitration agreement can save parties time and money

Agreement by the parties to submit their current or future dispute in respect of a defined legal relationship to arbitration is called an arbitration agreement. A valid arbitration agreement is thus a mandatory requirement for the establishment of jurisdiction of arbitration and a constituent basis for derogation of the state court jurisdiction. Arbitration agreement appears in two forms, depending on whether the arbitration is envisaged for all future disputes that may arise from the defined legal relationship between the parties or for the already existing dispute. The former is usually referred to as an arbitration clause (*clause compromissoire*), and the latter as an arbitration compromise (submission agreement, *compromis d'arbitrage*) [12, pp. 51-57].

The arbitration clause is a usual clause in international commercial contracts. Parties employ this clause to provide for the arbitration that will be competent for resolution of all disputes that may arise from their business relations. It is usually contained at the end of the contract and is often combined with a choice of the law clause [13, p.

³ See Convention on Recognition and Enforcement of Foreign Arbitral Awards of 1958 (New York Convention).

⁴ For details on ADR [10].

⁵ Thus, for example, the International Chamber of Commerce (ICC) offers various sets of rules that can be used either separately from or in conjunction with litigation or arbitration, namely: ICC Amicable Dispute Resolution Rules (ADR), ICC Rules for Documentary Instruments Dispute Resolution Expertise (DOCDEX Rules), ICC Rules for Expertise (Expertise Rules), ICC Dispute Board Rules (DB Rules).

190]. In international business practice the arbitration compromise has been less frequently used, which is not surprising given that once the dispute has arisen it is less likely for the parties to reach an agreement on any aspect of the dispute, including the dispute resolution mechanism. The differentiation between the arbitration clause and the arbitration compromise does not bear a significant practical relevance, given that the contemporary sources of arbitration law treat both forms of arbitration agreement equally.

Arbitration agreement, if well drafted, can save parties time and money by helping to avoid disagreements over procedures at the outset of a dispute [9, p. 447]. In that respect, parties to the arbitration agreement should particularly: 1) exhibit a clear intent to submit disputes to arbitration, so that there is no room for doubt with respect to the intention of the parties to entrust the arbitration with the power to resolve their dispute and to their decision to recognize the resulting arbitration award as final and binding; 2) correctly name the institutional arbitration and its rules or, if they opt for an ad hoc arbitration, clearly express intent to submit disputes to ad hoc arbitration; 3) precisely identify the scope of disputes covered by the arbitration agreement (e.g. all disputes “arising out of or in connection with the contract”). In addition to the above elements, parties to an arbitration agreement often specify the number of arbitrators and indicate the governing law, the place of arbitration and the language of arbitration.

If the parties opt for an institutional arbitration, it suffices to agree on the rules of that arbitration for the constitution of arbitral jurisdiction. Every institutional arbitration has its rules; they are drafted in the form of short codes of arbitral procedure with the aim of reflecting practical experience of proceedings and the needs of potential parties to arbitration. Arbitration rules apply to the organisation and jurisdiction of arbitration, constitution of the arbitration tribunal, arbitration proceedings, arbitration award, costs of arbitration, and other. It is considered that the parties by agreeing on institutional arbitration at the same time accept the rules of that arbitration to be applicable to the arbitration proceedings, and vice versa. In addition to arbitration rules, institutional arbitrations

also offer standard arbitration clauses which the parties are recommended to enter into the contract.⁶

Thus, for example, the International Chamber of Commerce (hereinafter referred to as the ICC) in its 2012 Rules of Arbitration (hereinafter referred to as the ICC Rules) provides standard arbitration clauses,⁷ which may be used by the parties without modification or modified as may be required by any applicable law or according to the parties’ preferences: “All disputes arising out of or in connection with the present contract shall be finally settled under the Rules of Arbitration of the International Chamber of Commerce by one or more arbitrators appointed in accordance with the said Rules.” If the parties do not want the Emergency Arbitrator Provisions of the 2012 ICC Rules to apply, they must expressly opt out by using the following arbitration clause: “All disputes arising out of or in connection with the present contract shall be finally settled under the Rules of Arbitration of the International Chamber of Commerce by one or more arbitrators appointed in accordance with the said Rules. The Emergency Arbitrator Provisions shall not apply.” The parties may also wish to stipulate in the arbitration clause the law governing the contract, the number of arbitrators, the place of arbitration and/or the language of arbitration. In principle, parties should also always ensure that the arbitration agreement is in writing and carefully and clearly drafted. The standard clause can be modified in order to take account of the requirements of national laws and any other special requirements that parties may have. In particular, parties should always check for any mandatory requirements at the place of arbitration and potential place(s) of enforcement; make

6 Existing arbitration institutions in Serbia - Permanent Arbitration attached to the Serbian Chamber of Commerce and Belgrade Arbitration Center (BAC) - provide for the recommended arbitration clauses. Thus, for example, Belgrade Arbitration Center (BAC) offers the following clause: “All disputes arising out of or in connection with the present contract shall be finally settled by arbitration organised in accordance with the Rules of the Belgrade Arbitration Center (Belgrade Rules). Parties may consider adding the following: The number of arbitrators shall be (specify: one or three). The place of arbitration shall be (specify: town and state). The language to be used in the arbitral proceedings shall be (specify preferably only one language). The applicable substantive law shall be (specify the applicable law)”. Available at: <http://www.arbitrationassociation.org/en/belgrade-arbitration-center/recommended-clause/>.

7 The ICC offers a range of standard clauses for different combinations of procedures. All standard and suggested dispute resolution clauses recommended by the ICC can be found at: www.iccarbitration.org.

special arrangements where the contract or transaction involves more than two parties; combine several ICC dispute resolution services. Combined and multi-tiered dispute resolution clauses may help to facilitate dispute management and reduce time and costs. Arbitration can be combined with pre-arbitral referee procedure, mediation, expertise, dispute Boards and virtually any other form of ADR [9, pp. 448-449].

Unlike the institutional setting, ad hoc arbitration⁸ does not have its rules or permanent organisation, offices, administration, and the list of arbitrators. Thus, it is necessary that the parties, which opt for ad hoc arbitration, define in the arbitration agreement all the matters relevant for the constitution of jurisdiction and the conduct of the proceedings. If they fail to do so, and the seat of ad hoc arbitration is in Serbia, provisions of the Serbian Law on Arbitration would apply by default, filling in the gaps within the agreement of the parties. A full ad hoc arbitration clause should provide for the rules of the procedure (usually UNCITRAL Arbitration Rules), number of arbitrators (typically sole arbitrator or a three-member arbitral tribunal) and the procedure of their appointment, place of arbitration, language of the proceedings as well as the appointing authority. For jurisdiction of ad hoc arbitration to be constituted, it is not necessary that the clause should contain all of the above elements, but only those unambiguously demonstrating the intention of the parties to entrust the settlement of disputes to ad hoc arbitration.

The standard arbitration clauses of international institutional arbitration and the model clauses contracting ad hoc arbitration drafted by international organisations,⁹ are a reflection of what is considered as a recommendable solution at the international level. For these reasons, and particularly bearing in mind the risk of vague, imprecise and contradictory formulations of arbitration clauses, the standard and model arbitration clauses represent the optimum solution to be kept in mind when drafting an arbitration clause in each specific case.

⁸ On differences between institutional and ad hoc arbitration [12, pp. 23-24], [14, pp. 239-241].

⁹ See, for example, the model arbitration clause published by the International Trade Centre [11].

Appropriate selection and appointment of arbitrators may speed up the dispute resolution process

After a dispute has arisen, the parties are advised to make sufficient enquires to ensure that they will make the appropriate selection and appointment of arbitrator/arbitrators who will resolve their dispute. From the perspective of the need to provide an efficient and cost-effective procedure, the first recommendation in that regard is to select experienced arbitrators with available time, arbitrators with strong case management skills, arbitrators who will render the award in a timely manner [15]. Further questions which must be addressed by the parties in the context of constitution of the arbitral tribunal are related to the number of arbitrators, method of their appointment, qualifications of the arbitrators and the appointing authority in ad hoc arbitration.

Parties often provide in arbitration clauses for the number of arbitrators in charge of resolving their dispute. As a rule, an odd number of arbitrators is required,¹⁰ above all in order to avoid deadlocks in rendering the award [1, pp. 247-251]. Other than this limitation, parties are free to determine the number of arbitrators by mutual agreement. Should they fail to determine the number of arbitrators, it is to be determined in accordance with the rules of institutional arbitration or by the relevant appointing authority in ad hoc arbitration.

Solutions with respect to the number of arbitrators in comparative law vary according to whether the sole arbitrator or arbitral tribunal is the first choice.¹¹ The main

¹⁰ This is also a mandatory requirement under the Serbian Law on Arbitration (Art. 16.2)

¹¹ Thus, for example, according to the ICC Rules, the disputes shall be decided by a sole arbitrator or by three arbitrators (Art. 12.1), and where the parties have not agreed upon the number of arbitrators, the Court shall appoint a sole arbitrator, save where it appears to the Court that the dispute is such as to warrant the appointment of three arbitrators (Art. 12.2). Swiss Rules of International Arbitration (hereinafter referred to as Swiss Rules) contain a similar rule, providing that if the parties have not agreed upon the number of arbitrators, as a rule, the Court shall refer the case to a sole arbitrator, unless the complexity of the subject matter and/or the amount in dispute justify that the case be referred to a three-member arbitral tribunal. On the other hand, the Belgrade Rules provide that parties may agree that their dispute shall be resolved by a three-member arbitral panel or by a sole arbitrator (Art. 15.1). If the parties have not agreed on the number of arbitrators, the Board shall determine the number of arbitrators taking into account the circumstances of the dispute. Where the amount in dispute does not exceed 50,000 EUR, the dispute shall be resolved by a sole arbitrator (Art. 15.2).

argument in favour of opting for sole arbitrator is that the sole arbitrator usually brings significant cost savings and may be quicker. On the other hand, it is argued in favour of arbitral tribunal that in case of serious disputes, a sole arbitrator feels a sense of heavy responsibility; when opting for a sole arbitrator, parties ought to be aware of the fact that the outcome of arbitration will be determined by one person alone. Arbitrators as a rule feel “more comfortable” when they form part of a collegial body where they can exchange opinions about the case and discuss issues relevant to rendering the award. One of the most important arguments in favour of a three-member tribunal is that it gives each party the possibility of nominating a member of the tribunal, which tends to increase their confidence in the process [9, p. 137]. This is particularly supported by the fact that the procedure of constituting an arbitral tribunal is typically quick and simple. Finally, in international arbitration, it is assumed that parties in a foreign country will have more confidence in a collegial forum rather than in a sole arbitrator [5, pp. 309-311]. When parties opt for arbitral tribunal, they usually provide for three arbitrators. In principle, it is possible to provide for a greater number of arbitrators (for example five), but this would normally involve higher costs and possibly a slower procedure.

As for the choice between sole arbitrator and a three-member arbitral tribunal in international commercial arbitration, from the table below it can be noted that in the ICC International Court of Arbitration, which plays a major role in international institutional arbitration, the option in favour of arbitral tribunal is preferred to a sole arbitrator.

Table 2: Size of arbitral tribunals in cases submitted to the ICC International Court of Arbitration, 2007-2011

	Three-member arbitral tribunal	Sole arbitrator
Number of cases	1,691 (60%)	1,144 (40%)

Source: [9, p. 137]

Appointment of arbitrators and determination of their number are subject to party autonomy, as one of the fundamental principles of arbitration. In comparative arbitration law, it is widely accepted that agreement between the parties regarding the constitution of the

arbitral tribunal takes precedence over the provisions of the applicable default rules of arbitration. In this regard, parties may themselves specify the procedure to be applied in appointing arbitrators.¹² Mechanism for appointing the arbitrators is usually specified by the parties in the arbitration clause by which they generally define the procedure for appointing the arbitrators in case the dispute arises from their contract. Where the parties fail to specify the mechanism for appointing the arbitrators in the arbitration clause, they are free to agree on it subsequently, after the dispute arises. Only where the parties have not agreed upon the procedure of appointment of arbitrators, will this matter be resolved by the arbitral institution or as provided in the rules applicable to ad hoc arbitration.¹³

Table 3: Method of determining size of arbitral tribunal in cases submitted to the ICC International Court of Arbitration, 2007-2011

	Three-member arbitral tribunal	Sole arbitrator	Total
Specified in arbitration clause	1,283 cases (82%)	286 cases (18%)	1,569 cases (100%)
Subsequently agreed by the parties	318 cases (39%)	495 cases (61%)	813 cases (100%)
Fixed by the Court	90 cases (20%)	363 cases (80%)	453 cases (100%)

Source: [9, p. 139]

There are many different appointment mechanisms in international arbitral practice.¹⁴ However, one can note that, in the case of a sole arbitrator, it is most often provided that the parties shall make their appointment by mutual agreement, and if they fail to do so, the arbitrator will be nominated by the arbitral institution or by an appointing

12 This principle is also accepted in the Serbian Law on Arbitration providing that parties may agree on the nomination procedure for the arbitrators, and if this is not envisaged by the agreement, the arbitrators shall be nominated pursuant to that Law (Art. 17.1).

13 With regard to the mechanism of appointing arbitrators, one should take into consideration a distinction between institutional arbitration and ad hoc arbitration. In institutional arbitration, if the parties fail to provide for the number of arbitrators and the mechanism of their appointment, such issues are resolved in accordance with the rules of the selected arbitral institution which determines the composition of the arbitral tribunal and organises the proceedings. This is in contrast with ad hoc arbitration, where there are no arbitral institutions, thus all issues related to the procedure, including the appointment of arbitrators, are organised by the parties themselves.

14 Comparative law analysis of this matter [8, p. 460 et seq].

authority (or other pre-determined third party) in ad hoc arbitration. On the other hand, where there are three arbitrators to be appointed, usually each party nominates one arbitrator and the third arbitrator is chosen either by those two arbitrators, by the arbitral institution, or by appointing authority (or other pre-determined third party) in ad hoc arbitration.¹⁵ According to the ICC Rules, where the parties have agreed that the dispute shall be resolved by a sole arbitrator, they may, by agreement, nominate a sole arbitrator for confirmation. If the parties fail to nominate a sole arbitrator within 30 days from the date when the claimant's request for arbitration has been received by the other party, or within such additional time as may be allowed by the ICC Secretariat, the sole arbitrator shall be appointed by the ICC Court (Art. 12.3).

Table 4: Selection process for sole arbitrators in cases submitted to the ICC International Court of Arbitration, 2007-2011

Joint nomination by the parties	Appointment by the Court	Other
251 (22%)	871 (77%)	15 (1%)

Source: [9, p. 142]

In certain cases, parties use the arbitration clause to provide for certain qualifications or qualities required of arbitrators. Thus, it is sometimes provided that arbitrators (or only the presiding arbitrator) must be “professional lawyers” or “highly qualified lawyers in the field of international trade” or that the presiding arbitrator “must not be from the country of either of the parties”, i.e. that he/she must come from “a third country”. On the other hand, in certain complex disputes relating to specific areas, parties may provide in arbitration clauses for a whole list of qualifications required of arbitrators. Certain clauses, furthermore, provide for different qualifications for each member of the panel. Thus, the arbitration clause contained in international technology transfer contracts may, for example, provide that an arbitrator must be an expert with international experience in the field of accounting, whilst the other must be a lawyer specializing in intellectual

¹⁵ Such appointment procedure is provided also by the Serbian Law on Arbitration (Art. 17), as well as by the rules of the existing arbitral institutions in Serbia (Rules of the Permanent Arbitration at the Chamber of Commerce and Industry of Serbia, Arts. 18-19, Belgrade Rules, Arts. 16 and 17).

property law, and the third must be a former judge or professor in the relevant area of law, etc. [6, pp. 61-62].

The ad hoc arbitration clauses often provide for the appointing authority. It is a person or institution to be in charge of the appointment of arbitrators in case parties fail to agree on that point. The appointing authority appoints a sole arbitrator when parties are unable to agree on the arbitrator, as well as the presiding arbitrator when the arbitrators appointed by the parties fail to agree on the former. In the practice of international business transactions, the appointing authority is selected, for example, from among presidents of commercial or other state courts responsible for resolving commercial disputes in the place of arbitration, presidents of the relevant chamber of commerce, etc. A simple way of resolving this issue may be to agree on application of UNCITRAL Arbitration Rules (dated 15 December 1976, and revised in 2010) adapted specifically to ad hoc arbitration, setting forth in detail the rules for designating and appointing authorities in arbitration proceedings (Arts. 6 and 8-10).

How to provide effective case management?

It has been widely accepted in comparative arbitration law and international arbitral practice that arbitral tribunal may conduct the proceedings in any manner it considers appropriate,¹⁶ ensuring the equal treatment of the parties and affording each party a reasonable opportunity to present its case and the evidence supporting it.¹⁷ The arbitrators and the parties are expected to make every effort to conduct the arbitration in an expeditious and cost-effective manner, taking into consideration the complexity and value of the dispute.¹⁸

There are certain requirements and recommendations in international arbitral practice, relating to the general duty of arbitrators and parties to control the time and costs of the proceedings. Thus, for example, the ICC Rules require from the arbitral tribunal the following *three steps* in organisation

¹⁶ Provided that it is not contrary to the agreement of the parties.

¹⁷ Fair and impartial treatment of the parties is a fundamental principle of arbitration adopted in international conventions relating to arbitration and in all national arbitration laws and arbitration rules.

¹⁸ See, for example, Art. 22.1 of the ICC Rules.

of the proceedings: to draft the *terms of reference* (Art. 23), to organise and hold a *case management conference* (Art. 24.1) and to prepare a *procedural time-table* (Art. 24.2).

Terms of reference consist of a document signed by the parties and arbitrators with the purpose to set out the parties' claims, identify the issues which the arbitrators must resolve, and determine the main procedural rules applicable to the arbitral proceedings. Drafting of the terms of reference is explicitly required of the arbitral tribunal only in the ICC Rules (Art. 23).¹⁹ However, it has been widely accepted in the practice of civil law-style institutional and ad hoc arbitration that the arbitrators, at the outset of the arbitration procedure, in cooperation with the parties, should draw up the terms of reference on the basis of the case documents and in light of the submissions of the parties. By summarizing the merits of the dispute and setting out the applicable procedural rules, terms of reference serve as an important guide for arbitrators and parties, which significantly improves the efficiency of the proceedings [8, pp. 665-674].

The case management conference is a useful tool for making arbitral proceedings as expeditious and cost-effective as possible and for ensuring that the procedure is tailored to the circumstances of each particular case. Although in most arbitration rules (with the exception of the ICC Rules) the case management conference is not defined as mandatory, it is often applied in arbitral practice as an initial step in the proceedings, during preparation of the terms of reference or as soon as possible thereafter. With the aim of efficiency and cost reduction, the case management conference is often organised and held by telephone or use of IT that enables communication between the arbitrators and the parties. The main goal of the case management conference is to provide, at the beginning of the proceedings, the opportunity for arbitrators to consult the parties on procedural measures that may be adopted in the course of the proceedings.²⁰

In that respect, the ICC has adopted a non-exhaustive list of *case management techniques* which can be included in procedural measures adopted by the arbitral tribunal upon appropriate consultation with the parties at the case

management conference. The most important of these techniques include: bifurcating the proceedings or rendering one or more partial awards on key issues; identifying issues that can be resolved by agreement between the parties or their experts; identifying issues to be decided solely on the basis of documents rather than through oral evidence or legal argument at a hearing; techniques relating to production of documentary evidence; limiting the length and scope of written submissions and written and oral witness evidence, so as to avoid repetition and maintain focus on key issues; using telephone or video conferencing for procedural and other hearings where attendance in person is not essential and using IT applications that enable online communication; informing the parties that they are free to settle all or part of the dispute either by negotiation or through any form of amicable dispute resolution, etc.²¹

At an early stage of the proceedings, as soon as practicable, usually during or following the case management conference, the arbitrators, in consultation with the parties, prepare a procedural (provisional) timetable for the conduct of the arbitration. The procedural timetable and its eventual modifications are provided to the parties and to the secretariats of institutional arbitration. The preparation of procedural timetable is required as mandatory by most modern arbitration rules²² and has become a usual step in the organisation of arbitral proceedings in arbitral practice. The main purpose of the procedural timetable is that the arbitrators, in cooperation with the parties, should fix the time limits in the proceedings, so as to avoid unnecessary delay and expense and to provide a fair and efficient process for resolving the parties' dispute. Usually, procedural timetables determine all the stages of the arbitration, including the dates for meetings and hearings, deadlines for filing of written submissions, evidence and witness statements as well as deadline for rendering the final award.²³

21 Appendix IV to the ICC Rules of Arbitration. Appendix IV is based on the Report of the ICC Commission on Arbitration *Techniques for Controlling Time and Costs in Arbitration*, available at www.iccwbo.org.

22 See, for example, the ICC Rules, Art. 24.2, UNCITRAL Arbitration Rules, Art. 17.2, Belgrade Rules, Art. 29.4, Swiss Rules, Art. 15.3, Arbitration Rules of the Arbitration Institute of the Stockholm Chamber of Commerce (Stockholm Rules), Art. 23, etc.

23 For details, see [9, pp. 265-266].

19 On terms of reference with respect to the ICC Rules [9, pp. 239-260].

20 See the ICC Rules, Art. 24.

As for the subsequent procedure for arbitration, it is useful for the parties to take into consideration the points that may assist in reducing the costs and duration of the proceedings.²⁴ Some of the most important points relate to establishing the facts of the case early in the proceedings, organisation of hearings and allocation of the costs of the proceedings.

Fact-finding is one of the most important functions of the arbitrators. The duty of arbitrators to proceed within as short a time as possible to establish the facts of the case is a significant factor for providing expeditious proceedings.²⁵ In doing so, the arbitrators and the parties will better understand the main points of the case at the beginning of the proceedings and avoid wasting the time and money on matters that are undisputed or irrelevant. The arbitrators determine the relevant facts of the case either following the presentation by the parties of documentary and/or oral evidence, or by arbitrators making their own efforts, with the assistance of the parties, to collect the evidence that they consider necessary to establish the relevant facts [1, p. 385]. Since documentary evidence plays a key role in fact-finding in most arbitration disputes, Appendix IV to the ICC Rules on Case Management Techniques provides detailed suggestions in that respect. According to these suggestions, the parties and the arbitrators should consider: 1) requiring the parties to produce with their submissions the documents on which they rely; 2) avoiding requests for document production when appropriate in order to control time and cost; 3) in those cases where requests for document production are considered appropriate, limiting such requests to documents or categories of documents that are relevant and material to the outcome of the case; 4) establishing reasonable time limits for the production of documents; and 5) using a schedule of document production to facilitate the resolution of issues in relation to the production of documents.²⁶ The need for efficiency in arbitral proceedings imposes time limits on the parties to submit documents (usually by procedural orders or procedural timetables) and additional

documentary evidence outside the determined time limits is not allowed [9, p. 270].

All the arbitration rules provide for a hearing to take place at the request of either party, or at the instigation of the arbitral tribunal. A typical provision to that effect is that of UNCITRAL Arbitration Rules, setting out that “Subject to any contrary agreement by the parties, the arbitral tribunal shall decide whether to hold oral hearings for the presentation of evidence or for oral argument, or whether the proceedings shall be conducted on the basis of documents and other materials. However, unless the parties have agreed that no hearings shall be held, the arbitral tribunal shall hold such hearings at an appropriate stage of the proceedings, if so requested by a party” (Art. 24.1). Arbitrators, in consultation with the parties, determine the date, time and location of a hearing(s) and provide the parties with the notice thereof. The general principle in arbitration is that hearings are held in private. The arbitrators are free to organise the hearings as they find appropriate, subject only to compliance with the principles of due process and equal treatment of the parties [8, p. 706], [1, p. 413]. In deciding about the organisation of hearings, arbitrators should bear in mind the requirement to ensure that each party has a reasonable opportunity to present its case, as well as the requirement to conduct the arbitration in an expeditious and cost-effective manner. In view of the fact that hearings are often expensive and time-consuming, one should follow the suggestion of the ICC according to which “If the length and number of hearings requiring the physical attendance of the arbitral tribunal and the parties are minimized, this will significantly reduce the time and costs of the proceedings” [15, p. 13]. It is for these reasons that in modern arbitral practice, whenever possible and whenever suited to the circumstances of the case, hearings are normally held by video conference or other IT applications that enable direct communication between the participants in arbitral proceedings, without physical attendance.

The costs of arbitration include the arbitrators’ fees, all expenses related to the hearings, fees and expenses of experts engaged by the arbitrators and the administrative expenses of the arbitral institution in institutional arbitrations. For the parties in arbitration, it is important

²⁴ See full list of these points [15, pp. 247-251].

²⁵ See the ICC Rules, Art. 25.1.

²⁶ Appendix IV, point d.

to pay due regard to provisions of the rules applicable to arbitration proceedings which set the allocation of the costs of the proceedings amongst the parties to dispute. While it is often the case that the allocation as per 'success in dispute' is provided, this may not always be the case [14, pp. 252-253]. The ICC Rules are an example of arbitration rules which expressly provide for the allocation of the costs, stating that the final award shall fix the costs of the arbitration and decide which of the parties shall bear them or in what proportion they shall be borne by the parties (Art. 37.4). Furthermore, it is expressly stated that, in making decisions as to the costs, the arbitral tribunal may take into account such circumstances as it considers relevant, including the extent to which each party has conducted the arbitration in expeditious and cost-effective manner (Art. 37.5).

It sometimes happens in arbitral practice that the parties, through excessive document requests, excessive legal argument, excessive cross-examination, dilatory tactics, failure to comply with procedural orders, etc., unreasonably slow down the process, or increase costs. For these reasons, arbitrators are recommended to inform the parties at an early stage of the proceedings that they will take into account the manner in which each party has conducted the proceedings and sanction any unreasonable behaviour by a party when deciding on the costs [15, p. 15].

In addition, the arbitrators who do not comply with the requirement to conduct the proceedings in an expeditious and cost-effective manner may themselves be sanctioned. For example, the ICC Rules provide that an arbitrator shall be replaced at the ICC Court's own initiative when he is not fulfilling the arbitrator's functions in accordance with the ICC Rules or within the prescribed time limits (Art. 15.2). These sanctions may also be of a financial nature, due to the fact that the ICC Court takes into consideration the efficient conduct of the arbitration when fixing the arbitrators' fees. Thus, Appendix III to the ICC Rules on Arbitration Costs and Fees states that, in setting an arbitrator's fee, the Court shall take into consideration the diligence and efficiency of the arbitrator, the time spent, the rapidity of the proceedings, the complexity of the dispute and the timeliness of the submission of the draft award (Art. 2.2).

Fast track arbitration guarantees a speedy procedure but also brings certain risks

Fast track arbitration can be an effective way to speed up the dispute resolution process, reduce the costs and encourage the settlement [1, p. 433], as well as an appropriate tool for parties to adapt the proceedings to their particular needs. In broadest terms possible, fast track arbitration may be described as a technique related to the conduct of the proceedings with the tendency to accelerate resolution of business dispute and help the parties to reduce the time taken to reach a solution.²⁷

Fast track arbitration may take place both in institutional and ad hoc arbitrations. Certain number of the rules of international arbitration institutions provide for the specific rules for fast track arbitration. These include: Rules for Expedited Arbitrations of the Stockholm Chamber of Commerce (SCC), German Institution of Arbitration's - DIS - Supplementary Rules for Expedited Proceedings 08 (SREP), Rules for Expedited Procedures of the American Arbitration Association (AAA), Swiss Rules of International Arbitration, Section V, Arbitration Rules of the Japan Commercial Arbitration Association (JCAA), Section V. On the other hand, the ICC Rules contain a general rule on expedited procedure stating that the parties may agree to shorten the various time limits set out in the ICC Rules (Art. 38.1) without providing further specific provisions on fast track arbitration.

There are different approaches to the concept of fast track arbitration under various arbitration rules. However, it is possible to distinguish certain basic elements as general features of fast track arbitration [17, p. 260 et seq.].

In the first place, fast track arbitration must be agreed between the parties. The parties may agree on this kind of arbitration within the arbitration clause by providing in advance for the principle of an expedited arbitration in case of a dispute, or they may do it at any time thereafter, in the course of arbitration. Institutional arbitrations, which provide specific rules for expedited arbitrations, offer to the parties the appropriate model arbitration clauses.

²⁷ On the issue generally [8, pp. 681-682].

Thus for example, the Rules for Expedited Arbitrations of the Stockholm Chamber of Commerce (SCC), contain the following model arbitration clause: “Any dispute, controversy or claim arising out of or in connection with this contract, or the breach, termination or invalidity thereof, shall be finally settled by arbitration in accordance with the Rules for Expedited Arbitrations of the Arbitration Institute of the Stockholm Chamber of Commerce. Recommended additions: The Seat of arbitration shall be (...), The language of arbitration shall be (...), The contract shall be governed by the substantive law of (...)”.²⁸

Another feature of fast track arbitration concerns the limitation of procedural steps. This limitation relates above all to the restriction on the number of written submissions, the organisation and conduct of oral hearings and expedited arbitral awards. Thus, for example, with regard to the expedited award, DIS - Supplementary Rules for Expedited Proceedings 08 (SREP) state that, unless the parties have agreed otherwise, the arbitral tribunal may abstain from stating the facts of the case in the arbitral award (Section 7)²⁹, and under the Rules for Expedited Arbitrations of the Stockholm Chamber of Commerce (SCC), the arbitrator is not obliged to include the reasons for the award, unless one of the parties requests it so no later than at the closing statement (Art. 35.1).³⁰

An important characteristic of fast track arbitration relates to short and strict time limits in the proceedings determined by the parties who wish to reduce the time between the request for arbitration and the issuance of the arbitral award. These time limits may apply to every stage of the proceedings - nomination of the arbitrator/arbitrators, submissions of the parties, signature of terms of reference, organisation of the oral hearings and rendering of the arbitral award.

Notwithstanding, however, the obvious advantages of fast track arbitration, it should be noted that this kind of accelerated procedure brings certain risks and disadvantages [2, p. 88]. Thus, for example, agreeing to short time limits may provide ground for challenging the award or resisting

its enforcement,³¹ for example because the arbitral tribunal was deprived of the time and means to consider the case properly or because a party was not able to present its case, which constitutes a breach of *equal treatment* of the parties and *compliance with due process* as the fundamental principles of arbitration. Furthermore, arbitral awards which do not include reasons for the award or fact of the case may become subject for challenging more easily than “classic” awards [17, p. 261]. On the other hand, only certain issues, such as disputes relating to price determination, are warranted and capable of being resolved by fast track arbitration, while, conversely, complex disputes involving addressing a large number of factual and legal issues would be unsuited to an expedited procedure [8, pp. 681-682], [1, p. 435]. Finally, the cooperation between the parties is a key factor for the success of fast track proceedings; if only one party is interested in speed and the other is reluctant to cooperate, the overall success of the fast track proceeding will be endangered. For these reasons, parties are well advised to exercise special caution when agreeing upon a fast track procedure, and to avoid conflict between the need for rapidity and the requirement for due process and legal certainty [17, pp. 275-276].

Conclusion

It has been demonstrated that the key aspects in the development of the strategy for providing efficiency in resolution of business disputes are related to the selection of arbitration as a dispute resolution procedure, drafting arbitration agreement, selection and appointment of arbitrators and establishment of the appropriate framework of the arbitral proceedings by providing conditions for effective case management and implementation of the best techniques controlling time and money. Furthermore, although an expedited procedure such as fast track arbitration can be an effective way to speed up the resolution of a business dispute, parties need to be aware of its disadvantages and potential risks. The strategy for ensuring efficiency in resolution of business disputes needs to be developed timely, already at the time of entering into the contract,

28 Available at www.sccinstitute.com/media

29 Available at www.dis-arb.de/en/16/re

30 Available at www.sccinstitute.com/media

31 See Convention on Recognition and Enforcement of Foreign Arbitral Awards of 1958 (New York Convention).

rather than at the time a dispute has arisen. Finally, speed and efficiency of the procedure must not undermine the fundamental principles of arbitration such as equal treatment of the parties - due process and fairness, and generally must not be in contravention of the requirement of legal certainty. Serbian business community should pay special attention to all these factors when deciding on a dispute resolution policy for their contracts in order to achieve the optimal solutions.

References

1. Blackaby, N., & Partasides, C., with Redfern, A., & Hunter, M. (2009). *Redfern and Hunter on international arbitration*, fifth edition. Oxford: Oxford University Press.
2. Bühring-Uhle, Ch., and for the Second Edition Kirchhoff, L., Scherer, G. (2006). *Arbitration and mediation in international business*. Kluwer Law International.
3. Casella, A. (1992). *Arbitration in international trade*. NBER Working Paper Series. In working paper no. 4136. Retrieved from <http://www.nber.org/papers/w4136>
4. Charles River Associates. (2012). *Arbitration in Toronto: An economic study*. Retrieved from <http://www.crai.com/uploadedFiles/Publications/Arbitration%20in%20Toronto%202012-09-06.pdf>
5. David, R. (1982). *L'arbitrage dans le commerce international*. Paris: Economica.
6. DiMatteo, L.A. (2009). *Law on international contracting*. Kluwer Law International: Wolters Kluwer Law & Business
7. Doing Business World Bank Survey. (2016). Retrieved from www.doingbusiness.org/methodology
8. Fouchard, Ph., Gaillard, E., & Goldman, B. (1999). *Fouchard, Gaillard, Goldman on international commercial arbitration*. The Hague/Boston/London: Kluwer Law International.
9. Fry, J., Greenberg, S., & Mazza, F. (2012). *The Secretariat's guide to ICC arbitration*. Paris: ICC International Chamber of Commerce, The World business organisation.
10. Knežević, G., & Pavić, V. (2009). *Arbitraža i ADR*. Beograd: Izdavački centar Pravnog fakulteta Univerziteta u Beogradu.
11. Model contracts for small firms – Legal guidance for doing international business. (2010). Geneva: International Trade Centre.
12. Perović, J. (2002). *Ugovor o međunarodnoj trgovinskoj arbitraži*. Beograd: Službeni list SRJ.
13. Perović, J. (2012). *Standardne klauzule u međunarodnim privrednim ugovorima*. Beograd: Centar za izdavačku delatnost Ekonomskog fakulteta.
14. Perović, J., & Đorđević, M. (2013). Resolution of commercial disputes through arbitration as a contributor to improvement of business environment in Serbia. *Ekonomika preduzeća*, 65(3-4), 238-255.
15. Report of the ICC Commission on Arbitration and ADR Task Force on reducing time and costs in arbitration, (2012). *Controlling time and costs in arbitration*. Paris: ICC International Chamber of Commerce.
16. Sussman, E., & Wilkinson, J. (2012). *Benefits of arbitration for commercial disputes*. Retrieved from http://www.americanbar.org/content/dam/aba/publications/dispute_resolution_magazine/March_2012_Sussman_Wilkinson_March_5.authcheckdam.pdf
17. Welser, I., & Klausseger, Ch. (2009). Fast track arbitration: Just fast or something different?. *Austrian Arbitration Yearbook*.



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ANALYSIS OF THE FACTORS OF SUSTAINABLE AGRICULTURE IN SERBIA AND THE EUROPEAN UNION MEMBER STATES

Analiza faktora održive poljoprivrede u Srbiji i
zemljama Evropske unije

Abstract

The consequences of negative impact of agriculture on sustainable use of resources require the development of modern agricultural practices in linewith ecological principles which are sustainable in the long term. The main objective of this research is to define the model of sustainable agriculture, observedthrough different dimensions of sustainability, with the support of the multivariate analyses: principal component analysis and factor analysis. In addition to this, the paper defines the level of development of agriculture in Serbia in comparison to EU member states. The importance of determining the position of Serbia in relation to the EU member statesis reflected in the necessary harmonization of agrarian policy of Serbia and the EU, as well as of the environmental policies. The research results point to a multidimensional approach to sustainable agriculture, where there are significant differences in practice, in terms of economic, technological and environmental aspects of the development. Considering the lower level of development of agriculture in Serbia compared to European Union member states, the opportunity for sustainable agricultural development in Serbia are the IPA funds, respectively the IPARD component of pre-accession assistance availableto candidate countriesfor EU accession, aimed at reducing development disparities.

Keywords: *sustainable development, agriculture, factor analysis, Serbia, European Union.*

Sažetak

Posledice negativnog uticaja poljoprivrede na održivu upotrebu resursa iziskuju razvoj moderne poljoprivredne prakse, koja je u skladu sa ekološkim principima, odnosno održiva na dug vremenski period. Osnovni cilj ovog istraživanja jeste definisanje modela održive poljoprivrede, putem različitih dimenzija održivosti, koristeći multivarijacione metode: analizu glavnih komponenti i faktorsku analizu. Takođe, u radu je definisan nivo razvoja poljoprivrede Srbije u odnosu na zemlje EU. Značaj određivanja pozicije Srbije u odnosu na zemlje EU ogleda se u potrebi harmonizacije agrarne politike Srbije i EU, kao i usklađivanja politika za zaštitu životne sredine. Rezultati istraživanja ukazuju na multidimenzionalni pristup konceptu održive poljoprivrede, pri čemu postoje značajne razlike u praksi u pogledu ekonomskih, tehnoloških i ekoloških aspekata razvoja. S obzirom na niži nivo razvoja poljoprivrede Srbije u odnosu na zemlje EU, mogućnosti za održivi razvoj poljoprivrede Srbije predstavljaju IPA fondovi, odnosno IPARD komponenta pretpristupnih fondova, koja je namenjena kandidatima za članstvo u EU, s obzirom na to da se ova sredstva usmeravaju ka smanjenju razvojnih dispariteta.

Cljučne reči: *održivi razvoj, poljoprivreda, faktorska analiza, Srbija, Evropska unija.*

Introduction

Sustainable agriculture is a multidimensional concept of development, which was created in response to the degradation and vulnerability of natural resources. As such, it is defined in Agenda 21, emphasizing the importance of the production system that combines elements of economic and environmental production [20]. Accordingly, Edwards [4] argues that sustainability of agriculture means adjusting conventional production, i.e. the use of more efficient technologies which will reduce or eliminate undesirable effects, primarily on the environment. Academic literature offers various definitions of sustainable agriculture, which is viewed as production that provides profitability to the farmer (cash economy) on one hand, but on the other implies efficient management of agricultural land and other resources aimed at long-term survival of this sector (subsistence economy) [8]. In other words, it implies balance with the agroecological environment where the production takes place. Also, many authors highlight the significance of the sociological aspect of agriculture, which means that, in addition to productivity and profitability and environmental production, the concept of sustainable agriculture also includes quality of life [9]. In essence, it is difficult to precisely define this concept, in view of the fact that it implies economic, sociological and ecological sustainability of agriculture [23], [15], [16]. These three fundamental dimensions of sustainability point to the complexity of this concept, where the sustainable development of agriculture is reflected in fundamental changes in this sector. Birovljev et al. [2] point out that sustainable agriculture means the maximum use of renewable resources and effective category management, which involves a combination of traditional and modern technologies. It is precisely the importance of this concept that is reflected in the introduction of new and modern technologies in production, which yield multiple benefits for society as a whole.

Attaining the status of candidate for accession to the European Union implies a constant need for ranking the development of agriculture in Serbia and the EU member states, as this is the way to define the base for harmonizing the agricultural policy of Serbia and the CAP. It is therefore

essential to define the position of Serbia in relation to the EU member states. This is in line with Serbia's focus on full membership within the Union. This study observes the level of development of agriculture in Serbia and the EU member states through performance of agriculture aimed at the concept of sustainable development of this sector. Consequences of the negative impact of agriculture on natural resources, i.e. excessive utilization of soil and water, and disruption of biodiversity feature as the key issue of national policies. Integration of sustainable development into national policies has enabled the adaptation of conventional agriculture to environmental principles, in other words, the preservation of the agroecosystem. The EU's Common Agricultural Policy (CAP) for 2014-2020 includes definitions of support measures aimed directly at preservation of the environment, i.e. green direct payments. The CAP's budget framework includes the application of green payments, amounting to 30% of national funds, intended for producers applying good agricultural practices aimed at the protection of agro-environment [11]. In accordance with the concept of sustainability of agriculture, such a form of subsidizing agriculture is aimed at agroecological measures, at supporting organic production, and at innovative projects contributing to the preservation of environment [6]. As far as Serbia is concerned, the measures for sustainable development include a defined amount of funds for preservation of the environment, which are channeled primarily to organic production and preservation of genetic resources. The amount of these funds, however, is insignificant. In addition to this, inadequate protection of agro-environment in Serbia stems from undefined legal regulations [2].

Academic literature offers different classifications of sustainability indicators. In practice, the number of indicators is most dependent on the availability of other data sources, and on the possibility to quantify them. The European Commission uses the Sustainable Development Indicators (SDIs), a pyramid of indicators enabling the comparison of EU member states by taking into account socio-economic development, climate changes and energy consumption, sustainable production and its productivity, natural resources, quality of life, demographic changes and

globalization processes. The OECD defines sustainability of agricultural production through agroecological indicators, such as agricultural output, utilization of agricultural land, number and size of farms, use of inputs (fertilizers and pesticides), irrigation, organic production etc. It also defines clear impacts of agriculture on the environment through the quality of soil, water, air pollution etc. [13]. Stockle et al. [18] observe the concept of sustainability of agriculture through nine key indicators: profitability of production, productivity, quality of resources, energy efficiency, biodiversity, quality of life and social progress. Gomez-Limon et al. [7] define sixteen indicators of sustainability: revenue from agricultural production, share of agriculture in GDP, share of ensured agricultural production, employment in agriculture, stability of employment in this sector, risk of abandoning production, economic dependence of the farming sector, specialization, plot size, amount of salt in the soil, use of nitrogen fertilizers, use of phosphorus fertilizers, use of pesticides, irrigated areas, energy utilization and biodiversity protection. The essence of agriculture makes up its dynamism, as well as its interdependence and unbreakable bond with nature. Numerous negative consequences on soil, water, air, biodiversity and human health have made it necessary to introduce significant changes in agricultural production, and to develop more ecologically sustainable systems that are introduced in the production control system documentation and certification and which, therefore, guarantees safety for consumers.

On the basis of the various classifications of indicators in the context of this study, sustainable agriculture is defined by fourteen overall performance indicators, enabling comparative analysis of Serbia with the EU member states. The paper is divided into four segments. After an introduction followed by an elaboration of the methods employed in the study and the research results, the last segment offers conclusions adopted on the basis of the results presented above.

Research methodology

The aim of this paper is to identify different dimensions of sustainability of agriculture through factor analysis. The model of sustainable agriculture was defined through

fourteen indicators which could be directly or indirectly related with the process of sustainable development of agriculture. The research database was compiled by using available data sources: the Statistical Office of the European Communities (EUROSTAT), FAOSTAT, and the national databases for Serbia (Statistical Office of the Republic of Serbia) and Croatia (Croatian Bureau of Statistics). The observation period is approximately five years, from 2008 to 2012. As Croatia was not an EU member state in the said period, it is important to note that it was included in the analysis. Statistica 12 software was employed in this research. The empirical assessment of sustainability entails certain problems, such as the time period of observation, or the inability to assess all the factors affecting sustainable development of agriculture [7]. There were also some limitations related to the selection of model variables in terms of insufficient data, primarily for Serbia (for instance, lack of adequate data on the use of pesticides in the agriculture of Serbia for the observation period). Indicators of sustainable agriculture include the production and export performance, as well as the indicators that evidenced the importance of agriculture in the overall economy of the country (share in GDP and the share in total employment). These indicators demonstrate the level of development of the agrarian sector in a country. The analysis also included environmental indicators. Defined indicators of sustainable agriculture are:

- Share of agriculture in the total gross domestic product (% of GDP);
- Share of employment in agriculture in the total employment (%);
- Labor productivity in agriculture;
- Agricultural exports per active agricultural producer;
- Agricultural exports per hectare of agricultural land;
- Average economic size of farms (standard output/ number of farms);
- Yield of cereals per hectare (kg/ha);
- Livestock unit per hectare (LU/ha);
- Share of arable land in the total agricultural land (%);
- Used fertilizer (kg/ha);
- Share of irrigated areas in the total agricultural land (%);

- Share of areas under organic production in the total agricultural land (%);
- Costs for environmental protection (EUR per capita);
- Greenhouse gas emission from agriculture (%).

The study employed methods of multivariate techniques: principal component analysis and factor analysis. Factor analysis has been increasingly used over the last decade in all areas of business research, and it is particularly suitable for analysis of complex schemes and multidimensional relationships the researchers are facing with. The significance of factor analysis is reflected in the reduction of the number of variables to a smaller set of variables, i.e. factors [3], [19]. This analysis is based on the principal component analysis, with varimax factor rotation. The results of the principal component analysis are eigenvalues, which represent the number of factors within a data series. This study includes all factors with eigenvalues higher than 1, and within which the factor loadings are higher than 0.7. The final step of the factor analysis is determining factor values for each unit of observation (EU member states and Serbia), i.e. the factor scores. Factor scores enable the countries to be ranked in relation to indicators pertaining to a given factor. This allows for a comparison to be made between Serbia and other countries included in the analysis, in relation to the defined dimensions of sustainability.

Research results

Eigenvalues, being the variables of main components, show the number of factors expected within the factor analysis. This study contains four factors with eigenvalues higher than 1 (Table 1). Also, 77.23% of total variations are explained by these four factors.

The following step of the factor analysis comprises grouping indicators into factors. The results of the factor

analysis, with valmax factor rotation, reveal the structure of data where the indicators are classified into four groups. Grouping implies a strong correlation of indicators with a certain factor.

The first factor (F1) includes the following indicators: labor productivity in agriculture, agricultural exports per active agricultural producer, agricultural exports per hectare of agricultural land, average economic size of farms, yield of cereals per hectare, total number of livestock units per hectare and costs for environmental protection. Given the nature of the indicators, this factor stands as the general level of development of a country's agriculture. Respectively, higher productivity of land and labor, better export performance and higher average economic size of farms are characteristics of the developed countries. In addition to this, highly developed countries have higher expenditures for environmental protection. The second factor (F2) comprises two indicators: share of arable land in the total agricultural land and used fertilizer per hectare. Ranking the countries reveals in which country the used fertilizer per hectare is more present, in other words, which country has a lower share of arable land in the total agricultural land. The third factor (F3) includes the share of irrigated areas in the total agricultural land and emission of greenhouse gases from agriculture, with these countries being ranked according to the higher share of irrigated areas in the total agricultural land and lower emission of greenhouse gases. The fourth factor (F4) covers indicators that show the importance of agriculture in the economy of a country (share of agriculture in the total gross domestic product and in total employment) and the share of areas under organic production in the total agricultural land. The final step of factor analysis is to determine factor scores for each country within this study and to rank the countries within each factor (Table 3).

Table 1: Principal component analysis

No.	Eigenvalue	% of total variance	Cumulative eigenvalue	Cumulative variance %
1	5.944903	42.46359	5.94490	42.46359
2	2.083015	14.87868	8.02792	57.34227
3	1.564275	11.17339	9.59219	68.51567
4	1.218406	8.70290	10.81060	77.21857

Source: The authors' own calculations

Table 2: Grouping sustainable agriculture indicators into factors

	Factor loadings			
	F1	F2	F3	F4
Share of agriculture in the total gross domestic product (% of GDP)	-0.377647	-0.135499	-0.071826	-0.689889
Share of employment in agriculture in the total employment (%)	-0.258497	-0.108190	-0.289218	-0.720723
Labor productivity in agriculture	0.682540	0.072928	0.190560	0.368130
Agricultural exports per active agricultural producer	0.881063	0.111884	0.045913	0.096901
Agricultural exports per hectare of agricultural land	0.883213	0.054781	0.200238	-0.080872
Average economic size of farms (standard output/number of farms)	0.843724	-0.178707	-0.020339	0.235294
Yield of cereals per hectare (kg/ha)	0.820410	0.305921	-0.198486	0.165448
Livestock unit per hectare (LU/ha)	0.808515	0.420279	0.177524	0.152758
Share of arable land in the total agricultural land (%)	0.011495	-0.799321	0.106717	-0.156154
Used fertilizer (kg/ha)	0.296245	0.843571	-0.005475	-0.080403
Share of irrigated areas in the total agricultural land (%)	-0.007504	0.055090	0.905645	0.023214
Share of areas under organic production in the total agricultural land (%)	-0.168652	-0.437144	-0.385982	0.741125
Costs for environmental protection (EUR per capita)	0.708510	0.063983	0.384802	0.367261
Greenhouse gas emission from agriculture (%)	-0.239851	0.351418	-0.674183	-0.197668

Source: The authors' own calculations

Factor 1, whose eigenvalue is 5.94, accounts for 42.46% of total variations. It comprises seven indicators, as defined in the previous section of the paper. Given the nature of the indicators, the first factor views the economic dimension of sustainable agriculture. These indicators speak of a general level of development of agricultural production. Also, the ecological indicator (costs for environmental protection) indicates the general level of development in a country. The largest factor scores (Table 3) are observed in the Benelux countries, Denmark, Germany, France and the UK. Taking into account the position of Serbia in relation to the EU member states, it is noticeable that the agriculture in Serbia lags behind the agricultures of other countries in terms of development. Such results are devastating, as the long-term concept of sustainable development implies constant economic growth of the agricultural sector, technological progress, efficient resource management and increase in the quality of life [21]. The agricultural production system, which is environmentally friendly but is not economically sustainable for the producer, cannot be regarded as acceptable.

The second factor, whose eigenvalue is 2.08, could be defined as the technological aspect in agricultural production, observed through the use of inputs (used fertilizers per hectare) and share of arable land in the total agricultural land. Both indicators refer to the

management of agricultural land, with the inevitable impact of agriculture on the environment. The used fertilizer per hectare is a significant indicator of sustainability of agricultural production (factor loading is 0.84). Notably, many authors define sustainability of agriculture as the function of the level of used inputs, such as fertilizers [24], [17]. Appropriate use of fertilizers increases the productivity of land, whereas, on the other hand, the environmental effect that the use of these inputs produces on the quality of natural resources must be pointed out. N mineral fertilizers are produced using high amounts of energy (gas), and therefore contribute to greenhouse gas emission and fossil fuel depletion. Some environmental pollution issues caused by the production of P mineral fertilizers are related to the contamination of phosphate rocks with heavy metals and other elements which, once released into the environment or transferred onto the soil, may pose a risk to ecosystems and humans [5].

The third factor comprises the following indicators: share of irrigated areas in the total agricultural land and greenhouse gas emission from agriculture. This factor, with eigenvalue of 1.56, accounts for 11.17% of total variation. Emission of harmful gases from agriculture, causing the greenhouse effect, represents a direct, negative impact of agricultural production on the environment. For this reason, the European Union has defined measures and

Table 3: Factor scores

Factor 1		Factor 2		Factor 3		Factor 4	
Belgium	3.00488	Ireland	3.85322	Malta	2.62267	Austria	1.91518
The Netherlands	2.93382	Slovenia	1.33481	Cyprus	2.47432	Sweden	1.33544
Luxembourg	1.41040	The UK	1.05294	Italy	1.25029	The UK	1.14647
Denmark	1.21456	Portugal	0.68071	The Netherlands	0.99478	Slovenia	0.99610
Germany	0.59173	Croatia	0.66807	Luxembourg	0.81443	Italy	0.96516
France	0.52475	Malta	0.50753	Romania	0.73824	Germany	0.84911
The UK	0.04892	Luxembourg	0.34862	Greece	0.62982	Luxembourg	0.81277
The Czech Republic	0.03312	Spain	0.29295	Denmark	0.47454	Denmark	0.61119
Ireland	0.00510	Cyprus	0.18844	Spain	0.33493	The Czech Republic	0.55222
Slovenia	-0.03210	Greece	0.17436	Portugal	0.31071	France	0.54517
Malta	-0.19153	France	0.13941	Finland	0.16541	Spain	0.42536
Finland	-0.19699	Belgium	0.13400	Bulgaria	0.11026	Finland	0.33818
Austria	-0.25780	The Netherlands	0.10582	Slovenia	-0.10194	Estonia	0.28097
Sweden	-0.26066	Italy	0.08044	The UK	-0.14791	Portugal	0.13763
Spain	-0.28167	Romania	-0.02232	Slovakia	-0.19906	Slovakia	0.10088
Italy	-0.28413	Bulgaria	-0.18831	Croatia	-0.22722	Malta	0.07633
Lithuania	-0.34036	Germany	-0.22470	Hungary	-0.32370	Cyprus	-0.00669
Portugal	-0.34770	Serbia	-0.26294	France	-0.33682	Ireland	-0.01787
Hungary	-0.41302	Austria	-0.34718	Germany	-0.37335	Latvia	-0.15013
Croatia	-0.42468	Latvia	-0.35447	Poland	-0.37884	Lithuania	-0.48046
Slovakia	-0.49067	Lithuania	-0.47139	Serbia	-0.43907	Greece	-0.61176
Poland	-0.55854	Poland	-0.48423	Sweden	-0.57804	The Netherlands	-0.62656
Estonia	-0.71030	Hungary	-0.64962	Belgium	-0.74981	Hungary	-0.74648
Latvia	-0.71417	Estonia	-0.83226	Austria	-0.76381	Bulgaria	-0.76049
Greece	-0.74015	Slovakia	-0.86914	Lithuania	-1.10492	Belgium	-0.86178
Romania	-0.74308	The Czech Republic	-0.97280	The Czech Republic	-1.14530	Croatia	-0.92303
Bulgaria	-0.75587	Finland	-1.14287	Estonia	-1.23530	Poland	-1.49456
Serbia	-0.90076	Sweden	-1.23862	Latvia	-1.25019	Romania	-1.55505
Cyprus	-1.12310	Denmark	-1.50050	Ireland	-1.56509	Serbia	-2.85331

Source: The authors' own calculations

directives influencing the reduction of greenhouse gases in the agricultural sector [5]. The second indicator shaping this factor is irrigation. Irrigation of agricultural areas influences productivity and sustainability, primarily in small farms, reflecting its socio-economic significance [12]. Furthermore, the impact of irrigation on the environment should not be underestimated. Wriedt et al. [22] point out that developed countries use modern, sustainable irrigation systems, in accordance with environmental protection regulations. In addition to this, in certain European countries (in the Mediterranean region), irrigation is of key importance primarily because dry spells, without irrigation, cause lower yields, while the surplus of nitrogen remains accumulated in the soil after

the harvest. This factor, however, is the most difficult to define, as irrigation may produce both positive and negative effects on the environment. Therefore, a more comprehensive analysis of this indicator is necessary, while also taking into account the availability of water at the local level, source of water for irrigation and other indicators revealing the environmental impact of using water in agriculture. Irrigated areas in Serbia are insufficient (1.77% of total agricultural land), accompanied by a lack of regulations in the segment of environmental protection and reduction of greenhouse gas emission from agriculture [2]. Given that one of the prerequisites for Serbia's accession to the EU is harmonization of legislation in the domain of environmental protection, Serbia is faced with a great

task of aligning these policies and regulations with the EU legislation.

The last factor, whose eigenvalue is 1.22, accounts for 8.70% of total variation. The focus here is on organic production (factor loading is 0.74) and its connection with the concept of sustainable agriculture. As far as sustainability of agriculture is concerned, it is in most cases observed through the technological side of sustainability of agriculture, which is represented by various agricultural practices protecting the environment [15]. One of such systems is organic production. Increase in demand for products that are in compliance with environmental principles of production (environmentally friendly) in the European Union has resulted in the development of this technology [10]. Undoubtedly, this production which does not use chemical inputs yields multiple benefits for the society as a whole [14]. In other words, organic production could contribute to socio-economic and environmentally friendly sustainable development, with the possibility of increasing revenues and improving quality of life [1]. This is where its importance is actually reflected. Factor scores place Serbia almost at the bottom of the ranking table, which suggests that relative lag in production performance also entails the inability to adequately develop organic production in Serbia. Nevertheless, this result was to be expected given that, among the analyzed countries, Serbia has the smallest share of land under organic production in the total area (0.15%).

Conclusion

The results of this study point out the significance of certain dimensions of sustainability of agriculture. Namely, the factors obtained within this model identify economic, technological and environmental aspects of sustainability of agriculture. However, it must be emphasized that it is not possible to draw a clear-cut line between these dimensions. For instance, productivity of agriculture depends on the agroecological conditions within a country. Also, the second factor, i.e. the technological aspect, could also be observed as the environmental dimension of agriculture. In other words, sustainability of agriculture is, in most cases, perceived as overcoming the conflict between economy

and ecology, where it implies production that enables achieving high yields and profit without degradation of the environment and natural resources on which agricultural production is based. Thus, this definition of agriculture implies benefits both for producers and society as a whole.

In this paper, the economic aspect within the model of sustainable agriculture represents the most significant factor, accounting for 42.46% of total variation. The performance of agriculture within the first factor shows the level of development of agriculture, where the unfavorable position for Serbia is perceived. Economies such as the Benelux countries, Denmark, Germany, France and Great Britain boast the best production and export performance of agriculture. In addition, the use of inputs, land management and the impact of agriculture on the environment (the second and the third factor) are important aspects of sustainable development of agriculture. Organic production, as one of the model variables, was taken under the supposition that sustainable agriculture is reflected in the introduction of new technologies in production while adhering to environmental principles. It is difficult to determine which analyzed country or group of countries has put in place a sustainable system of agriculture, given that synchronized development of all dimensions of sustainability is virtually impossible. This leads to a conclusion that it is necessary to determine the degree of significance of each selected indicator for each country at the given moment of its development. It is also important to emphasize that insufficient environmental awareness, as well as the lack of motivation on the part of current generations not to impair the future generations with their activities, are yet additional obstacles to the sustainable development of agriculture within a country.

In practice, sustainability of agriculture is achieved by coordinating the activities of agricultural and environmental policies. Significance of sustainability within the European Union has already been brought to the fore with adopted laws and directives aimed at the preservation of the agro-environment. On the other hand, in comparison to the European Union member states, Serbian agricultural performance is significantly lagging behind. The imperative of Serbia's agricultural policy in the future should be the alignment with the principles

of the EU's Common Agricultural Policy, as well as the harmonization of environmental policies and the EU rules. A chance for Serbian agriculture are the IPA (Instrument for Pre-Accession Assistance) and IPARD components of pre-accession assistance to candidate countries for EU accession whose aim is to reduce development disparities. Therefore, it is necessary to emphasize that the effects of these funds (improving the quality of life, environmental protection) will depend on the efficiency of its disbursement, as well as on the modality of using the respective funds.

References

1. Birovljev, J., & Štavljanin, B. (2011). Development of organic food production in European countries with comparable resources. *Strategic Management*, 16(3), 23-33.
2. Birovljev, J., Matkovski, B., & Četković, B. (2014). Poljoprivreda i zaštita životne sredine Srbije u funkciji prilagođavanja Zajedničkoj agrarnoj politici Evropske unije. *Anali Ekonomskog fakulteta u Subotici*, 50(32), 17-29.
3. Osborne, J. W., & Costello, A. B. (2009). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Pan-Pacific Management Review*, 12(2), 131-146.
4. Edwards, C. A. (1989). The importance of integration in sustainable agricultural systems. *Agriculture, ecosystems & environment*, 27(1-4), 25-35.
5. European Commission. (2007). *Klimatske promene – izazovi za poljoprivredu*. Retrieved from http://www.seerural.org/wp-content/uploads/2009/05/01_KLIMATSKE-PROMENE-lzazovi-za-poljoprivredu.pdf
6. European Commission. (2013). Overview of CAP Reform 2014-2020. Retrieved from http://ec.europa.eu/agriculture/policy-perspectives/policy-briefs/05_en.pdf
7. Gómez-Limón, J. A., & Sanchez-Fernandez, G. (2010). Empirical evaluation of agricultural sustainability using composite indicators. *Ecological economics*, 69(5), 1062-1075.
8. Hamblin, A. (1991, November). How do we know when agricultural systems are sustainable? In *Environmental indicators for sustainable agriculture*. Report on a national workshop. LWRDC and GRDC.
9. Keeney, D. R. (1989). Toward a sustainable agriculture: Need for clarification of concepts and terminology. *American Journal of Alternative Agriculture*, 4(3-4), 101-105.
10. Lampkin, N. H., & Padel, S. (1994). *The economics of organic farming: An international perspective* (No. 338.162 E19e). Oxon, GB: CAB International.
11. Matkovski, B., & Kleut, Ž. (2014). Integration processes and rural development policy as factors affecting competitiveness and economic efficiency of agrarian economy of Serbia. In *Strategic Management and Decision Support Systems in Strategic Management - 19th International Scientific Conference SM2014*, Subotica, Serbia.
12. Mihailović, B., Cvijanovic, D., Milojević, I., & Filipović, M. (2014). The role of irrigation in development of agriculture in Srem district. *Ekonomika poljoprivrede*, 61(4), 989.
13. Organization for Economic Cooperation and Development/OECD (2001). *Environmental indicators for agriculture: Methods and results*. Retrieved from <https://www.oecd.org/tad/sustainable-agriculture/40680869.pdf>
14. Rigby, D., & Cáceres, D. (2001). Organic farming and the sustainability of agricultural systems. *Agricultural Systems*, 68(1), 21-40.
15. Schaller, N. (1993). The concept of agricultural sustainability. *Agriculture, ecosystems & environment*, 46(1), 89-97.
16. Siche, J. R., Agostinho, F., Ortega, E., & Romeiro, A. (2008). Sustainability of nations by indices: Comparative study between environmental sustainability index, ecological footprint and the energy performance indices. *Ecological Economics*, 66(4), 628-637.
17. Stoate, C., Boatman, N. D., Borralho, R. J., Carvalho, C. R., De Snoo, G. R., & Eden, P. (2001). Ecological impacts of arable intensification in Europe. *Journal of Environmental Management*, 63(4), 337-365.
18. Stockle, C. O., Papendick, R. I., Saxton, K. E., Campbell, G. S., & Van Evert, F. K. (1994). A framework for evaluating the sustainability of agricultural production systems. *American Journal of Alternative Agriculture*, 9(1-2), 45-50.
19. Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics*. Boston: Pearson Allyn & Bacon.
20. The United Nations Conference on Environment and Development, Earth Summit/UNCED. (1992). *Rio declaration on environment and development*. Rio de Janeiro, Brazil.
21. Vićentijević, D., Aćimović, L. J., & Stevanović, S. (2011). Uticaj tehnološkog razvoja na održivi razvoj poljoprivrede i zaštitu životne sredine. *Ekonomika poljoprivrede*, 58(2), 191-203.
22. Wriedt, G., Van der Velde, M., Aloe, A., & Bouraoui, F. (2009). Estimating irrigation water requirements in Europe. *Journal of Hydrology*, 373, 527-544.
23. Yunlong, C., & Smit, B. (1994). Sustainability in agriculture: a general review. *Agriculture, Ecosystems & Environment*, 49(3), 299-307.
24. Zandstra, H. (1994). Sustainability and productivity growth: Issues, objectives and knowledge needs– Guidelines for working groups. In *Reconciling Sustainability with Productivity Growth*. Report of a workshop. Gainesville, Florida, May 1993, University of Florida and Cornell University.



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INFLUENCE OF TECHNOLOGICAL DEVELOPMENT ON ENCOURAGING INNOVATIVENESS OF DOMESTIC INDUSTRIAL ENTERPRISES*

Uticaj tehnološkog razvoja na podsticanje inovativnosti domaćih industrijskih preduzeća

Abstract

Technology and technological development are the key factors of contemporary socio-economic development, and the application of the latest technological achievements is the developed countries' most powerful means of competitiveness. Intensive technological changes produce an influence on increasing the dynamics of the business conditions, making them uncertain, unpredictable and discontinued, while forcing business entities to adapt constantly. In this paper, the influence of technological development on the enhancement of innovativeness of domestic industrial enterprises is studied, given the fact that today, as well, industry is the branch of economy which the prosperity of the majority of the developed countries rests on. Study on the subject is divided into four parts. In the first part, the mutual dependency of technological and economic development is examined, with special attention to the strategic aspects of technological development. The second part of the paper is dedicated to observing innovativeness as the basis for technological development. The analysis of certain indicators of innovativeness in domestic enterprises is presented in the third part, whereas in the last part, analysis of the data obtained by conducting research into the influence of technological development on encouraging innovativeness of domestic industrial enterprises was carried out by investigating the role of graduate engineers in this process. The aim of this paper is to indicate the significance and complexity of the influence of technological development on contemporary business conditions, and also to conduct an analysis of the influence of technological development on encouraging innovativeness in domestic industrial enterprises. The ultimate goal of the paper is to define certain measures that are to be taken so as to improve the existing, highly unfavorable, situation in this field.

Keywords: *technology, innovativeness, development, business entities, industry, human resources.*

Sažetak

Tehnologija i tehnološki razvoj predstavljaju ključne faktore savremenog društveno-ekonomskog razvoja, a primena najnovijih tehnoloških dostignuća čini najmoćnije sredstvo konkurentnosti razvijenih zemalja. Intenzivne tehnološke promene utiču na povećanje dinamičnosti uslova poslovanja, čineći ih neizvesnim, nepredvidivim i diskontinuiranim, i primoravajući privredne subjekte da im se stalno prilagođavaju. U ovom radu proučava se uticaj tehnološkog razvoja na pospešivanje inovativnosti domaćih industrijskih preduzeća, budući da je industrija i danas privredna grana na kojoj počiva prosperitet većine razvijenih zemalja. Proučavanje predmetne problematike podeljeno je na četiri dela. U prvom delu rada proučava se međusobna uslovljenost tehnološkog i privrednog razvoja, sa posebnim osvrtom na nužnost strategijskog pristupa u ovoj oblasti. Drugi deo rada posvećen je proučavanju inovativnosti kao osnove tehnološkog razvoja. Analiza određenih pokazatelja inovativnosti domaćih privrednih subjekata izneta je u trećem delu rada, dok je u poslednjem delu rada izvršena analiza podataka dobijenih istraživanjem uticaja tehnološkog razvoja na podsticanje inovativnosti domaćih industrijskih preduzeća, kroz proučavanje uloge diplomiranih inženjera u ovom procesu. Cilj rada je da se ukaže na značaj i kompleksnost uticaja tehnološkog razvoja na savremene uslove poslovanja, kao i da se na osnovu podataka dobijenih sprovedenim istraživanjem izvrši analiza uticaja tehnološkog razvoja na podsticanje inovativnosti u domaćim industrijskim preduzećima. Krajnji cilj rada jeste da se definišu određene mere koje bi trebalo preduzeti kako bi se postojeća, veoma nepovoljna, situacija u ovoj oblasti poboljšala.

Ključne reči: *tehnologija, inovativnost, razvoj, privredni subjekti, industrija, ljudski resursi.*

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Introduction

Contemporary technological achievements are among the most significant development factors and the most powerful means of competitiveness of the developed countries. Very intensive technical-technological progress has an influence on permanent changes in the conditions of doing business, the increasing severity of competition, as well as on the increase in the pressure on business entities to intensify their development. The development and application of the latest technological achievements imply a permanent increase in the quantum of knowledge of the economy and its entities; therefore, the developed economies are prevalently based on knowledge. Human resources are knowledge bearers, simultaneously being the bearers of intellectual capital, as the most important element of economic resources. Given the influence of technological development on business entities' corporate success, the paper shall study the most important features of the influence of technological development on business entities' development and business operations, then the strategic approach to the process of technological development, as well as the characteristics of innovativeness as the basis for technological development. In the final part of the paper, analysis of certain indicators of domestic economy's innovativeness is carried out, as well as an analysis of the data obtained through conducting research into domestic industrial enterprises, demonstrating the extent to which technological development influences the encouragement of the given enterprises' innovativeness.

Mutual dependency of technological and economic development

Technology (from Greek τέχνη (techne) – a skill, an art, knowledge, a means, a tool; and –λογία (logos) – science) could be defined more broadly as a science dealing with research into the production processes, or more narrowly, as a concrete system of production of a certain product by applying a determined procedure, while simultaneously using appropriate materials, tools, professional workforce and knowledge [8], [18]. In the contemporary conditions of doing business, technology has

become one of the most important factors of economic and social prosperity. Whether it is the objectified (*hardware*) or non-objectified (*software*) technological knowledge, the influence of technology on contemporary economic and business processes is great and significant. Unlike the previous stages of socio-economic development, when technology was developing separately from science, in the contemporary conditions a systematic link has been established between the development of science and the development of technology. As an activity tasked to broaden the boundaries of one's perception of reality and attain new knowledge, science creates a basis for development and technology aimed at application of scientific knowledge in practice. By doing so, science has become the basis for contemporary technological development, since it enables the complete technical equipping of production, as well as a decrease in the workforce's participation in the direct process of production, strengthening the role of creativeness of human resources in value creation [16, p. 171]. Tight connection between science and technology and the application of their joint results represent necessary conditions for a more rapid development of each national economy and its present-day business entities.

Although technology and technological development are as old as the human society, the qualitative changes in their significance were intensified in the process of the first industrial revolution and have continued to date, when we are becoming aware of the fourth industrial revolution. The significance of the influence of technology is also supported by the fact that contemporary technological achievements are the most powerful means of competitiveness in the highly developed countries and the basis of their monopolistic position in many fields of international economic and political relations.

Technological progress may result in the creation of new processes and new products and services, as well as in the creation of novelties in marketing and organization [22, p. 15], [10, p. 72]. Technological changes contribute to a significant extent to an increase in the dynamic quality of the environment and conditions of doing business, bringing about their greater uncertainty and unpredictability. All this makes the conditions of doing business discontinuous, leading to the need for

globalization of the market and the world economy, and intensifying the need for permanent diversification of production programs and quick changes thereof. Those who are the quickest in adapting to changes will survive in such changeable conditions. "In industrial revolution 4.0, adaptation means adequate speed" [7, p. 34]. The new technological revolution and the informatics revolution as its integral part have also led to the economic revolution.

The influence of technological development on the achieved economic growth and development of countries is very significant. Research studies show that the share of technological in the total economic development may be within the range from 40% to up to 90% [4, p. 4]. Technological development is not only the basis, but also the imperative of development of each country and its business entities, because the said process contributes to a higher rate of economic growth, influences the increase in the productivity of business entities, improves the position of a country in the international distribution of work and contributes to a more complete satisfaction of the needs of the population, which, combined, results in higher living and social standards in general. Due to that, the countries and the business entities that do not achieve adequate technological development, permanently make their competitive position worse, which leads to a substantial slowdown in their development. In the value chain of a business entity, technology permeates all its activities, starting from the inbound logistics, all kinds of operational activities, marketing, sales, all types of management, all the way to the outbound logistics, technological development and the overall infrastructure of the enterprise [6, p. 682].

Developed countries are leaders in the sphere of technological progress, which is how they acquired their competitive advantage, and frequently a monopolistic position, on the global technology market. On the other hand, there are undeveloped countries characterized by a pronounced technological backwardness which they aspire to overcome while accelerating their developmental flows. Technology transfer appears as one of the instruments of their technological and economic development, and frequently also as the only one way for them to obtain certain more advanced technological solutions. Technology

transfer, however, apart from its undoubted positive effects (such as quicker attainment of technological solutions, employment of domestic resources, revival of the national economy, increase in employment and competitiveness), produces numerous negative effects, as well, one of the most unfavorable being these countries falling into permanent technological dependency [25, p. 281].

The development and application of the latest technological achievements is also implicative of a permanent increase in the quantum of knowledge of the economy and its business entities, causing that contemporary economies are referred to as the economies of knowledge or knowledge-based economies. The economy of knowledge implies an economy that bases its development on production, distribution and use of knowledge [9, p. 22]. Knowledge-based economies employ knowledge in all their economic operations and activities. The employment of numerous innovations and new technologies has, to a significant extent, contributed to the change in the economic structure of the developed countries and the widening thereof, resulting in the self-transformation of knowledge-based economies into knowledge-driven economies. A high level of science development and an educated population are an adequate basis for a more rapid technological development. Given the fact that the application of new technologies implies continuous education of employees, a relationship of tight interdependency is formed between knowledge, education, science, technology and economic development.

So far, experience has shown that in knowledge-driven economies there is an expansion of development possibilities, as well as a change in the conditions of doing business. According to a research study conducted by the Foundation for Information Technologies and Innovations, Singapore was the most developed country according to the applied criteria – 38% of Singapore's population is highly educated, there are 9.7 researchers per 1,000 workers, and 1.4% of GDP is invested in research and company development, whereas 0.9% of GDP is invested in public institutions [2, p. 43].

Contemporary enterprises must struggle to improve their competitive position by strengthening their technological basis and innovation potential. In order for an innovation to be successfully placed in the market, it is necessary

that appropriate efforts are made not only in the field of technology, but also in the fields of engineering and marketing, which are implicative of the very application of adequate knowledge. In order to respond to the said requirements, business entities must dispose of appropriate human, financial and material resources, they should develop cooperation with other entities and also build an appropriate organizational structure so as to establish an adequate link between the technological and economic spheres of their business [25, p. 270].

As it is not inherent in technology to spontaneously develop itself, it is necessary that the technology development process be managed, but managed systematically, in a planned manner and for the long term, which requires a strategic approach. The technological strategy, in a broader sense, is an element of the economic development strategy related to the long-term exploitation, development and maintenance of the total knowledge and capacity of an economy and its entities.

The significance of strategic approach to technological development has been more and more pronounced over time, because the level of technological development is essentially significant for an enterprise. Therefore, the level of technological development is the key factor in an enterprise's environment, while technology is the primary resource of an enterprise's competitive advantage. Technology's strategic influence may change the structure of the market and industry, and technological development permeates all segments of business. High technology also requires an appropriate level of culture, an appropriate

style of management and organization of doing business [30, p. 10].

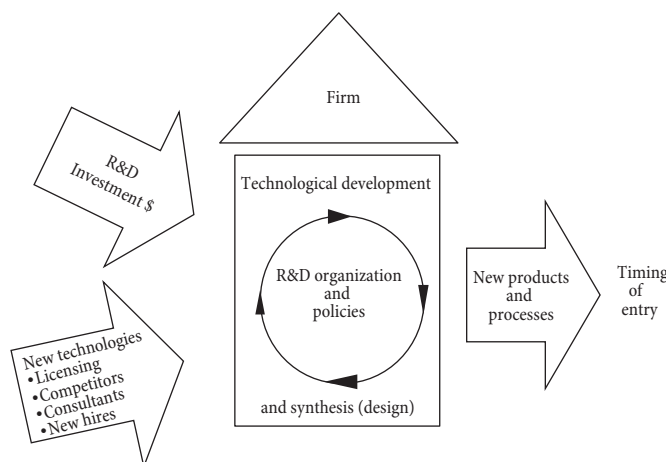
When formulating a technology strategy, business entities must be mindful of choosing between different technologies and available resources, as well as of the successfulness of application of the said technologies. Technology strategy permeates all business functions of an enterprise, starting from production, marketing, R&D, all the way to resource allocation and management (Fig. 1) [3, p. 234].

From a global viewpoint, technology strategy should encompass the following four segments: technology acquisition, usage, development and sales [25, p. 278]. Technology strategy is a means by which an enterprise can achieve each one of the three generic strategies: the lowest cost strategy, the differentiation strategy and the strategy of being focused [6, p. 688]. Given the fact that technology develops quickly, the once-defined technology strategy is not final – it must be subjected to revision and adjusted to current changes from time to time.

Innovativeness as the basis of technological development

Innovations and innovativeness (from Latin *innovatio* – a novelty, designing novelties, change) [31] represent the basis for contemporary technological development. The meaning, the role and the significance of innovativeness have changed as time passed, following technological and social changes. In the beginning, the innovative process

Figure 1: Technological policy framework



Source: [3, p. 234]

was performed mainly spontaneously and was a result of isolated activities of talented individuals who aspired to reach new solutions. Today, innovativeness covers a broad field and is a means, a manner of thinking and a tool in the struggle to survive. Innovativeness can be understood as entrepreneurs' specific tool and a means that helps them to employ change as a possibility for performing different production and service activities [5, p. 95]. It is also possible to understand innovation as an inspiration and a creation, renaissance and pressure exerted on changes in the learning process, representing a path to discoveries [20, p. 87]. The European Commission defined innovation as the renewal and extension of the product assortment and the markets related to them; the establishment of new methods of production, supply and distribution; the introduction of changes in the management and organization of labor and conditions and employees' skills [9, p. 12], whereas according to the OECD's definition, technological innovation is the transformation of an idea into a new or improved product or an operational process in industry or trade [11, p. 15]. Unlike invention, innovation is, as a rule of thumb, associated with practical application and can represent a process in which potential is turned into a new idea and its wide practical use [27, p. 67].

Constant changes in the business environment bring about permanent relativization of the position of business entities which are forced to incessantly adapt themselves to the respective changes. Adaption is, in general, much more successful if it is based on a strategic approach and planning. In the given circumstances, it is necessary that business entities integrate all their business functions and direct them toward creating, improving and maintaining competitiveness which is based on innovativeness. Business entities' innovation space is very broad and consists of four elements: the product, the process, the paradigm and the position [28, p. 76]. Enterprises must take care of all the elements of their innovation space, because the process of innovativeness and the process of technological development have become quite complex. For that reason, developed countries devote much attention to the process of innovativeness in the form of long-term, planned investments of resources in this field, through the implementation of innovative solutions, permanent

improvement of the process of innovativeness itself, as well as through the development of innovativeness in all spheres of doing business. Business entities generate their process of innovativeness on the basis of three factors: the organization's capabilities, the needs of the market and the science and technology basis [29, p. 45].

Enterprises that are more dedicated to their own innovative development normally achieve much better business results in comparison to their competitors. It is particularly important to emphasize that the business entities' approach to innovativeness must be planned in the long term and must be systematically applied. Research studies show that if an enterprise is permanently dedicated to innovativeness, its innovations are by 15% more likely to be successful [19, p. 69]. Given the complexity of contemporary technology, enterprises frequently combine the introduction of innovation of both products and processes. So, for example, they start manufacturing new products by applying a new technological procedure for which an enterprise needs greater resources, knowledge, experience, special skills and so forth. Perseverance in combining different fields of the application of innovations increases the likelihood of their successfulness by 2% to 4% [19, p. 70]. It is also very important for business entities to achieve complementarity while developing different types of innovation, because it enables achievement of synergetic effects and creates the possibility of increasing the enterprise's chances for its own development and improvement of competitiveness. The enterprises which have won the battle for the leading position in a particular segment of technical development aspire to have their innovation used by at least 50% of the consumers so that the innovation could become dominant, i.e. standard [26, p. 59].

The emergence of innovation itself, however, is not a guarantee that it will be successful in the market, just as the application of the most contemporary technologies all but guarantees high profitability. Once an innovation is introduced, the process of its development can be conducted in two directions: through the adaptation of the innovation and through competitors' imitation of the innovation [21, p. 62]. An innovation can be subjected to adaptation when the buyer is ready to accept the innovation.

The adaptation of an innovation is necessary because the conditions of the application of an innovation, in general, differ from one enterprise to another in terms of the difference between knowledge, experience, personnel, organization, infrastructure thereof and so forth. The complexity of contemporary technologies makes their application more complicated. If a certain technology has the potential to be applied and adapted in a larger number of fields, it helps its further improvement, advancement, new inventions, increase in knowledge and it creates far greater commercial value, as well. In practice, it is frequently the case that a large number of enterprises are mutually connected in certain forms of cooperation so as to reduce costs, which is particularly pronounced in the field of information technologies. Through their mutual cooperation, enterprises tend to use more rationally the available resources, which are always limited. Namely, this way the available resources are directed toward innovations development in the fields in which those enterprises competently operate and in which they have competitive advantage, whereas other activities are delegated to entities outside the enterprise [26, p. 205].

Innovations begin to be imitated once competitors start making efforts, as soon as possible, to offer the market their product or service which is very similar to the innovation that has already appeared in the market. For the innovator enterprise, it is important that its technology should be adapted as much as possible, i.e. applied in as many fields as possible, and to be applied by as many other business entities as possible. The processes of adaptation and imitation of an innovation are interconnected and interwoven.

The intensive process of innovation has led to the shortening of the lifecycle of technology and the products, so that the main weapons of enterprises in their fight to survive in the market are their changes and adaptation, first of all through the capability of differentiating products and services via innovativeness. That is why the most successful enterprises are the innovative ones, which base their business operations on knowledge and which are capable of quickly responding to challenges coming from the environment. In the said conditions, speed of reacting to the newly created changes is one of the critical factors

for business success. For that reason, business entities must be much quicker in their response to changes so as to achieve greater efficiency and flexibility and enhance their ability to endure discontinuity in doing business. In such circumstances, innovations are also introduced to the management modalities applied in order to achieve the greatest possible efficiency of the business systems which are organized in quite a new manner. The domain of employees must constantly be expanded so as to increase their motivation for more efficient performance of their tasks. This is also confirmed by a research study according to which the business results of the biggest world firms, such as General Electric, Du Pont, Procter & Gamble and Toyota, were contributed the most exactly by the process of innovating their management [17, p. 253]. Technical and technological progress condition the employees to face with new requirements in the future. The said requirements will be conditional upon the necessity of the development of employees' new characteristics, knowledge and skills in compliance with the new work and living conditions. The characteristics that will be esteemed the most in the future are passion in doing the work, creativity in problem solving and appropriate initiative [12, p. 127]. Creativity, as well as the employees' permanent creativity is something that will be the comparative advantage of the business entities that possess it. For that reason, the key changes in the management system should encompass the following three categories: (1) the content – which is implicative of change in the enterprise itself, its organizational structure, strategies, processes applied, technologies and so forth; (2) the people – through exerting influence on their behavior, emotions, sense, spiritual development, and (3) the process – as planned changes in the content and the employees, their projection and application [1, p. 17].

The majority of business entities do not possess sufficient resources to develop all the elements of innovative activity, which would be justified economically. Only large and economically strong enterprises can achieve the development of innovative activities in several fields. Those enterprises are technological leaders and are relatively few. The majority of the other enterprises develop only one or a few innovative fields in which they have competitive

advantage on the grounds of their knowledge, experience, personnel, tradition, the market and so forth.

Some indicators of innovativeness in the domestic economy

Innovativeness as a link between invention and its practical application stands as the basis of all developmental changes. Human knowledge, whose process of creation, expansion and application is permanent, and its influence on the overall development of the economy and society is complex, multidimensional and long-term, constitutes the basis for innovativeness [14, p. 547].

At the level of national economy, the science and research activity of innovativeness is what constitutes its basis. The level of development of innovative activity and the level of technological and overall economic development, too, depend on the amount of resources a country invests in this field and on the qualitative structure of those resources. The data showing that the most developed countries in the field of the SRP allocate between 3% and 4% of their GDP, which is one of the most significant factors of their economic development and technological superiority, speaks in favor of this assertion. For decades, less than 0.4% of the relatively low GDP has been allocated to the field of research and development in the domestic economy, which is insufficient for initiating any kind of relevant development [23], [24]. In order to take any steps forward whatsoever in the sphere of technological development, it is necessary that the approach to this activity be significantly modified not only at the level of the economy, but also at the level of business entities. Change in the approach means that investments in this field are not to be treated as an undesired cost, but rather as a highly profitable investment in the future.

When studying the condition of the research and development activities in Serbia, the analysis can be conducted in several directions. One of them is the structure of the organizations performing this activity per particular sectors. The latest available data indicate that 42.6% of the organizations performing scientific research work in Serbia belong to the sphere of higher education. The organizations of the non-financial sector account

for 30.4%; those of the state sector account for 25.3% in scientific research work, whereas the smallest number of the organizations performing this activity come from the non-profit sector, whose share is 1.7%. The stated data enable us to conclude that the field of research and development is concentrated in institutions of higher education and the non-financial sector, which account for over 70% of the organizations conducting this activity [24]. The said fact indicates that research and development in Serbia is still concentrated in the institutions which operate in the range of basic research, and that adequate connectedness between science and the economy is still lacking. Contrary to the abovementioned situation, in developed countries research and development has increasingly shifted to large corporations which also have their own research and development sectors. The respective development sectors are tasked to solve concrete developmental problems of the corporation through research. The process of the shifting R&D to enterprises contributes to an increase in their quantum of scientific and technological knowledge. For that reason, the majority of highly developed countries tends to integrate large and economically strong enterprises into the educational system of the country, while in some cases the said enterprises also have their own universities. The biggest world companies have their own scientific research laboratories, as is the case with the companies Xerox, RCA and AT/T. Given the fact that contemporary research studies are multidisciplinary, complex and as a rule of thumb quite expensive, it is implicative of the forming of an ever-increasing tighter connection between enterprises, on one hand, and universities and institutes, on the other. According to the data published in R&D Magazine in the United States in 2010, 70% of research and developmental works were performed exactly in enterprises, and merely 15% at universities, whereas one half of all the scientists in the USA were employed in industry or worked for the industry. The European Union, too, aspires to have two thirds of the R&D investments placed in private enterprises [18, p. 192]. The reason for the said tendencies lies in the fact that contemporary technologies are very complex, that their development frequently implies specific knowledge, skills and experience, which cannot always be bought, so enterprises are forced to create and

develop them by themselves, which is particularly so when speaking about leading technology companies [13, p. 7].

Today, scientific discoveries and innovations are tightly connected to practice, in a way that both in the world and in our country, those innovations whose commercial verification is relatively certain are pressed ahead. The retention of discovery at the level of theory, deprived of the commercial application of the same, is a process considered to be unsustainable in the long run for business entities and the economy. The link between practice and scientific and research work, however, is the weakest link in the chain of the domestic economy's innovativeness. Observed in the short term, the purchase of finalized technological solutions via some forms of technology transfer contributes far more quickly to the achievement of certain developmental goals set by the business entities. Observed in the long term, the exclusive purchase of finalized technological solutions, however, may lead enterprises to a state of permanent technological dependency. For that reason, the option of combining the purchased technology with their own solutions, as well as of further developing and adapting the purchased technology to their own conditions of application and needs, is the most acceptable option for the majority of business entities.

Size and economic strength of the business entities influence their innovativeness to a substantial extent. As a rule of thumb, large enterprises have significant resources at their disposal, therefore their innovation potential is greater, together with their chances to successfully commercialize their innovations, and they also possess greater strength to endure the risk of failed research studies and attempts. Table 1 classifies business entities in the Republic of Serbia according to their size and innovativeness.

By analyzing the data presented in Table 1, it can be perceived that large enterprises have the biggest share (66.2%) in the group of innovators, which confirms the fact that innovativeness can only be attributed to the business entities which possess the necessary resources. The data introduced in Table 1 are also indicative of the fact that small enterprises, whose share in the total number of business entities is 76.4%, participate as innovators to the smallest extent (40.8%). The presented data dispute the widespread opinion that small enterprises are the bearers of the process of innovativeness in this economy of ours. In the medium-sized enterprises group, 55% are accounted for as innovators. The data in Table 1 also show that there is a greater involvement of innovators in the production rather than in the service enterprises. Such a situation is a consequence of the fact that the production process offers a much broader and much more diverse space for innovativeness than is the case with the service sector.

The innovation potential of a national economy depends both on the structure of its innovative entities and the structure of innovations implemented in it. In the domestic economy, the situation regarding this issue is also unfavorable (Table 2).

By analyzing the data presented in Table 2, it is possible to conclude that, out of the total number of the business entities, the innovators account for less than one half, namely 44.6%. Amongst them, the most numerous are the non-technological innovators, whose share is 39.7%. The technological innovators account for no more than 27.4%, which indicates the fact that there is a relatively small number of domestic business entities dealing with innovativeness in the sphere of technological improvement. It is a consequence of the relatively low level of technological development, as well as the cause for a

Table 1: The structure of business entities according to their size and innovativeness (2010-2012)

No.	Business entities	Total		Innovators		Non-innovators	
		Number	%	Number	%	Number	%
1.	Total	11,841	100	5,280	44.6	6,561	55.4
2.	Small	9,057	76.4	3,691	40.8	5,366	59.2
3.	Medium-sized	2,264	19.1	1,245	55.0	1,019	45.0
4.	Large	520	4.5	344	66.2	176	33.8
5.	Production	4,122	34.8	2,007	48.7	2,195	51.3
6.	Service	7,719	65.2	3,273	42.4	4,366	57.6

Source: Statistical Yearbook of the RS 2015 and the Authors' own calculations.

situation like this one. Non-technological innovations are mainly cheaper, quicker to apply and imply a smaller risk than technological innovations, for which reason the prevalent investment in these is a consequence of the poverty of the economy, as well as of the inadequate treatment of this field.

Research into innovativeness of the domestic economy can also be conducted in the direction of the analysis of the structure of the very innovative activities applied by the domestic business entities, which is provided in Table 2. As the presented data indicate, the domestic business entities are somewhat more oriented toward product innovations than process innovations (21% to 19.1%). Innovations in the business entities' organizations account for 31.4% of the innovative activities, whereas innovations in marketing make up 29.7% of the total innovations. The stated structure of the particular types of innovations is indicative of the fact that, due to the scarcity of the resources they have at their disposal, domestic business entities are more focused on innovations that incur lower costs, and these are exactly novelties in the organization of the enterprise and novelties in the field of marketing activity.

Technological development and innovativeness of domestic industrial enterprises

Due to the complexity of technological development, it is very difficult to exactly define all the indicators of any given development. Technological development and innovativeness of the domestic economy are at a relatively low level. Numerous factors have led to this, while at the same time a lack of adequate strategic approach in this field, low investment in R&D lasting for many years and inefficient privatization are just some of the most relevant

ones. One of rather pronounced developmental problems of the domestic economy is also the deindustrialization process that intensifies all the existing backward processes. Even today, however, the industry is the branch of economy which supports the prosperity of the majority of the developed countries, because it has a multiplicative influence on the development of all other production and non-production activities, as well as on the overall socio-economic development. Due to the abovementioned, even in the future, the industrial sector will also play a very important role in the process of reviving and developing the domestic economy [15, p. 2]. Given the statements above, the following part of this paper introduces a research study which was conducted on domestic industrial enterprises, because technological development in the industrial sector is the basis for technological development of all other branches of economy.

One of the segments of the research study was aimed at examining the extent to which domestic industrial enterprises use their available personnel resources to encourage technological progress and innovativeness in order to strengthen their competitive position and improve their business success. In that sense, the research was conducted on a sample of industrial enterprises and on a sample of employees. The research study conducted in the Republic of Serbia in 2014 included, namely, the industrial enterprises operating in the following industries: chemical, pharmaceutical, paper, metal, mining and rubber. Within the framework of the research into the role and significance of human resources as the bearers of intellectual capital, relevance of graduate engineers was especially subjected to research, because they are the bearers of industrial enterprises' technological development and innovativeness. For that reason, this segment of the research includes those

Table 2: The structure of innovators and innovations according to the types (2010-2012)
(in %)

No.	Innovators		Innovations	
	Type	Share in %	Type	Share in %
1.	Total	44.6	Products	21.0
2.	Technological innovators	27.4	Processes	19.1
3.	Non-technological innovators	39.7	In organizations	31.4
4.	All innovators	22.6	In marketing	29.7
5.	Non-innovators	55.4	Still in progress or abandoned	7.9

Source: Statistical Yearbook of the RS 2015 and the Authors' own calculations.

enterprises deemed to be representative of their activity and which, on the other hand, employ a significant number of graduate engineers. In this segment, the research study encompassed 18 enterprises and 434 graduate engineers (in mechanical engineering, electrical engineering, mining-geological and technological-metallurgical professions). According to their size, the enterprises were classified into two groups – the one consisting of small and medium-sized enterprises (of up to 250 employees) and the other consisting of large enterprises (of over 250 employees). The sample was carefully stratified following the regional principle and it included enterprises inside the entire territory of the Republic of Serbia. The research goal in the said segment was to investigate the role, significance and influence of graduate engineers in technological development and innovativeness of the industrial enterprises where they are employed, as well as to gain knowledge on the condition of the industrial enterprises in view of the level of their technological development and innovativeness on the basis of the analysis and of what should be done to improve them.

The conducted research indicates that, among the industrial branches, graduate engineers account for the largest percentage share (32.9%) in the employee structure in the mining industry, which is only to be followed by the rubber industry (19.8%) and the chemical and metal industries, where graduate engineers account for 16.5% of the employees. A question, however, may be posed whether the employed engineers, as an important segment of human resources in the analyzed industrial enterprises, have the conditions needed to apply their acquired knowledge when performing their tasks. The research has shown that less than one half of the employed engineers, i.e. 42.2%, work as engineers, whereas 31.6% of the engineers are engaged in some sort of managerial or executive jobs. The majority

of the engineers even declared that they are only partly engaged on the job they were professionally trained for, for the most part in the pharmaceutical industry (66%) and the paper industry (as many as 83.3% of them only partly work on jobs which pertain to their profession). The stated data allow us to conclude that domestic industrial enterprises do not rationally use their human resources, for which reason the knowledge possessed by their graduate engineers remains insufficiently used.

A very rapid and dynamic technological development implies that experts constantly innovate their existing knowledge and skills and acquire new ones. The employees who keep up with the latest achievements and trends are quite a precious resource for each business entity, because they can be the bearers of innovativeness and its development. In accordance with the abovementioned, the research was directed toward the question of the extent to which certain types of professional development opportunities for graduate engineers were available. The results of the given research segment are presented in Table 3.

The data presented in Table 3 suggest a rather unfavorable structure of professional development sessions which the engineers in the surveyed enterprises attended. Namely, a relatively small percentage of graduate engineers took part in the development sessions in the field of introduction of new technologies; namely, most of them work in the chemical and the pharmaceutical industry (26.5% and 23.1%, respectively), while the smallest percentage came from the metal and the rubber industry, where only around 10% of graduate engineers attended the development sessions in this field. Such data are the consequence of the slow introduction of new technology in domestic enterprises due to poor business results, lack of financial and other resources, loss of competitiveness and the market share, for which reason trainings in this field

Table 3: The availability of certain types of professional development opportunities for graduate engineers in domestic industrial enterprises (in %)

No.	Branch of industry	Introduction of new technologies	Introduction of new standards	Both	N/A
1.	Metal	9.1	12.7	78.2	-
2.	Rubber	10.0	36.0	42.0	12.0
3.	Paper	20.0	30.0	50.0	-
4.	Chemical	26.5	10.2	61.2	2.0
5.	Mining	19.8	12.6	55.9	11.7
6.	Pharmaceutical	23.1	12.0	61.5	2.6

are relatively rare. The development sessions in the field of introduction of new standards were not attended by a high percentage of the engineers, either. In the rubber and the paper industry, 36% and 30% of graduate engineers, respectively, attended professional development sessions in the field of introduction of new standards, whereas in all the other industrial branches only 10% to 12.7% of graduate engineers attended professional development sessions in this field. The majority of the surveyed engineers reported that their professional development sessions in the field of introduction of new technologies had been related to their development in the field of introduction of new standards, which is especially so in the metal industry (78.2%), whereas some engineers could not even say what training they had attended, which is indicative of the low quality of training, as well as of their lack of interest in training.

In order for an engineer to do his/her work efficiently, it is necessary that professionals, apart from the appropriate type and level of professional qualifications, permanently keep up with the latest achievements in all the fields of science and technology development, especially in the field they themselves are engaged in. For that reason, one of the research segments was directed toward answering the question whether graduate engineers do keep up with the development of science and technology concerning their own profession (Table 4).

The data presented in Table 4 indicate quite an unfavorable situation in terms of keeping up with the development of science and technology by the graduate engineers employed in domestic industrial enterprises. Namely, the development of science and technology is observed by less than one half of the graduate engineers, with the exception of electrical engineers, whose share accounts for 51.2%. Yet more discouraging is the data showing that only 5.7% to 16.3% of the graduate engineers keep up with the development of science and technology

in their profession on a regular basis. The majority of the surveyed engineers only occasionally inform themselves about the latest trends in the field of the development of science and technology, namely as many as 50% of the engineers in mining and geology. The cause for such a relatively low interest in keeping up with the latest developments certainly lies in the fact that a large number of industrial enterprises are in an unfavorable position. In many industrial enterprises, production ceased or is only partially conducted, and the technology is obsolete. Many privatized enterprises closed their research and development sectors and observe engineers as mere performers, instead of treating them as a creative part of the human resources who should take initiative in solving current and developmental problems. Combined with relatively low salaries, this has brought about a lack of motivation in graduate engineers to implement the contemporary trends and develop their competencies. Due to the abovementioned, their interest in innovativeness and contribution to the development of their enterprise(s) is very weak.

Building on the abovementioned, a question may be posed regarding the extent to which industrial business entities in Serbia encourage and motivate their employees to constantly develop their knowledge and simultaneously contribute to the increase of the enterprise's efficiency, improvement of its business success and development. One of the manners to motivate employees to constantly develop their knowledge is to provide them with the opportunity to make progress by advancing in the employment hierarchical structure. The conducted research study has shown that the mutual dependency of continuous development of knowledge and a better job position is quite weak in domestic industrial enterprises (Table 5).

By analyzing the data presented in Table 5, one could establish the fact that almost one half of the respondents answered that there was no dependency between their

Table 4: Keeping up with the development of science and technology by graduate engineers (in %)

No.	Field of profession	Yes	Regularly	Occasionally	No	No answer
1.	Mechanical engineering	42.1	12.4	43.0	1.7	0.8
2.	Electrical engineering	51.2	16.3	32.6	-	-
3.	Mining-Geological	44.3	5.7	50.0	-	1.5
4.	Technological-Metallurgical	44.5	7.5	43.0	3.5	-

Table 5: Dependency between the engineers' position and continuous development of their knowledge (in %)

No.	Branch of industry	Yes	No	Partly	No answer available
1.	Metal	33.3	13.9	46.6	4.2
2.	Rubber	20.9	22.1	48.8	8.1
3.	Paper	25.0	41.7	33.3	-
4.	Chemical	22.5	25.4	47.9	4.2
5.	Mining	16.1	46.2	34.3	3.5
6.	Pharmaceutical	36.0	20.0	42.0	2.0

position and their continuous professional development, or if any did exist, it was only partial. The greatest mutual dependency between knowledge development and the job position is observed in the pharmaceutical and the metal industries, where 36% and 33.3% of the respondents, respectively, answered affirmatively. The link between the work position and professional development is the weakest in the mining (48.8%) and the paper (41.7%) industries, which are characterized by somewhat lower rate of technological development. In the enterprises operating in the rubber and the chemical industries, there is mainly a partial dependency between the position and permanent development, which is 48.8% and 47.9%, respectively, and it also depends on the size and competitiveness of the specific enterprise.

The problems of technological development have particularly been pronounced in the economies that have gone through a transition to the market conditions of doing business. The domestic economy also belongs to this group. Since the process of economic transition contributes to national economies opening up to other countries' economies, access to contemporary technologies should therefore be facilitated. In such a constellation of relationships, however, enterprises are faced with new requests, one of the most important being the creation and implementation of the strategy of continuous adaptation to changeable conditions of doing business, while simultaneously achieving a constant enhancement of efficiency and effectiveness criteria. The said requirements are very difficult to meet simultaneously. In order to implement these, it is necessary that all the employees be actively involved not only in the performance of operational tasks, but also in the process of solving all problems which an enterprise comes across in conducting its business operations. The conducted

research has demonstrated that, in the domestic industrial entities, insufficient attention is dedicated to motivating employees to constantly develop themselves professionally, to be innovative and contribute creatively to solving problems. However, given the fact that the acceleration of technological development is one of the basic preconditions for the revival, development and improvement of its competitiveness of the domestic economy, it is necessary that certain changes be introduced to the management of limited resources, and that the rationality of their use be increased. Large layoffs in the industrial sector (in the period from 2001 to 2010, 700,000 employees were fired) are also a major issue [32]. Simultaneously with the outflow of the workforce, which is a problem in its own right, there are inevitable and far more serious consequences related to the outflow of knowledge, experience, specific skills and employees' other competencies, which have been accumulated in this sector for a longer time and are very difficult to be quickly and fully compensated for [15, p. 3]. This is why it is very important to adequately manage all available resources, the human ones in particular, since humans are the bearers of intellectual capital. In order to achieve the necessary level of technological development in such limited conditions, it is necessary that an adequate strategy for technological development be defined, and the treatment of this field and human resources as the bearers of intellectual capital be changed.

Conclusion

In contemporary conditions, technological development is not only the basis, but also the imperative for the development of each country and its business entities. In the domestic economy, which is still trapped in the process of transition

and is simultaneously characterized by a low rate of growth, structural imbalance and unemployment, the problems of technological development are quite pronounced and they frequently hinder its revival and development. The conducted research shows that the situation in the field of innovativeness and technological development of domestic business entities is quite an unfavorable one. Apart from low investments in R&D, which have been below 1% of GDP for decades, the structure of the said investments is also unfavorable. The research study indicates that, out of the total number of business entities, innovators account for less than one half, i.e. 44.6%, whereas technological innovators account for only 27.4%. The analysis of the subject matter structure is indicative of the fact that the share of product and process innovations is approximately 20%, whereas organization innovations and marketing innovations boast the largest share, 31.4% and 29.7 percent, respectively. The data obtained through the research study conducted in domestic industrial enterprises, inclusive of graduate engineers as the bearers of the innovativeness of this type of the enterprise, indicate that less than one half of the engineers (42.2%) perform works which they were not professionally trained for, whereas the majority of the engineers occupy managerial and executive positions, which is indicative of the fact that this resource is being used irrationally. Besides, a relatively small number of the engineers attended professional development sessions in the field of introduction of new technologies (9%-26%), and only about 10% of the graduate engineers keep up with the development of science and technology within the field of their profession(s) on a regular basis. The research also demonstrates that domestic industrial entities dedicate insufficient attention to their employees' motivation to continuously develop themselves professionally, to be innovative and creatively contribute to problem solving. Given the fact that intensive technological development is conducive to permanent changes in the conditions of doing business and places new requirements before the enterprises with respect to adaptation and the continuous enhancement of efficiency and effectiveness criteria, it is necessary – for the purpose of reaching a solution to the unfavorable situation – that the domestic business entities maximally rationally use all of their resources, particularly

human resources, as the bearers of intellectual capital, and also apply a long-term strategic approach within the field of their technological development and innovativeness.

References

1. Anderson, D., & Ackerman Anderson, L. (2001). *Beyond change management advanced strategies for today's transformational leaders*. San Francisco: Jossey - Bass/Pfeiffer.
2. Bennett, R. (2010). Innovation and the internet demand new collaboration. *Ericsson Business Review*, 2, 41-45.
3. Burgelman, A. R., & Modesto, A. M. (1988). *Strategic management of technology and innovation*. Illinois: Irwin, Homewood.
4. Clifton, D. (1989). Elements of an effective assistance policy to stimulate economic development. *Economic Development Quarterly*, 1, 3-12.
5. Draker, P. (1991). *Inovacije i preduzetništvo*. Beograd: Privredni pregled.
6. Đuričin, D., Janošević, S., & Kaličanin, Đ. (2015). *Menadžment i strategija*. Beograd: Ekonomski fakultet.
7. Đuričin, D., & Vuksanović, I. (2016). The future of Serbia and how to survive it: Catching up and convergence with the EU. *Ekonomika preduzeća*, 1-2, 15-36.
8. *Ekonomika enciklopedija*. (1994). Beograd: Savremena administracija..
9. European Commission. (2004). *Innovation management and the knowledge-driven economy*. Brussels-Luxemburg: EVSC-EC-EAEC.
10. Ford, D., & Saren, M. (1996). *Technology strategy for business*. London: International Thompson Business Press.
11. *OECD, Growth in services, fostering employment, productivity and innovation*. (2005). Meeting of the OECD Council at the Ministerial Level: OECD.
12. Hamel, G., & Brin, B. (2007). *The future of management*. Harvard: Harvard Business School Press.
13. Kokeza, G. (2008). Tehnološka zaostalost Srbije – stanje i mogućnosti prevazilaženja. *Ekonomski vidici*, 1, 1-13.
14. Kokeza, G. (2012). Doprinos ekonomije znanja privrednom preobražaju Srbije. *Ekonomski vidici*, 4, 547-565.
15. Kokeza, G. (2014). Reindustrijalizacija privrede Srbije – ključni faktor u procesu evropskih integracija. *Ekonomski vidici*, 1, 1-11.
16. Kokeza, G. (2015). Unapređenje inovativnosti kao instrument ekonomskog razvoja. *Ekonomski vidici*, 2-3, 167-179.
17. Komazec, G. (2012). *Nauka, nove tehnologije i inovacija menadžmenta u svetu*. Beograd: Geografski institut "Jovan Cvijić" Srpske akademije nauka i umetnosti.
18. Kukoleča, S. (1994). *Organizaciono-poslovni leksikon*. Beograd: Rad.
19. Martinez-Ros, E., & Labeaga, M. J. (2009). Product and process innovation: Persistence and complementarities. *Europeann Management Review*, 6(1), 64-75.
20. Miller, L. W., & Morris, L. (1999). *Fourth generation R&D, managing knowledge, technology and innovation*. New York: John Wiley & Sons Inc.
21. Narayanan, K. V. (2001). *Managing technology and innovation for competitive advantage*. New Jersey: Prentice Hall.

22. Rosegger, G. (1980). *The economics of production and innovation*. Oxford: Pergamon Press.
23. Statistički godišnjak RS. (2014). Beograd: Republički zavod za statistiku.
24. Statistički godišnjak RS. (2015). Beograd: Republički zavod za statistiku.
25. Stavrić, B., & Kokeza, G. (2009). *Upravljanje poslovnim sistemom*. Beograd: Tehnološko-metalurški fakultet.
26. Schilling, A. M. (2005). *Strategic management of technological innovation*. New York: McGraw-Hill Irwin.
27. Tidd, J., & Hull, F. M. (2003). *Service innovation – Organizational responses to technological opportunities & market imperatives*. London: Imperial College Press.
28. Tidd, J., & Bessant, J. (2009). *Managing innovation, integrating technological, market and organizational change*. Chichester: John Wiley & Sons.
29. Trott, P. (2005). *Innovation management and new product development*. London: Prentice Hall.
30. Twiss, B., & Goodbridge, M. (1989). *Managing technology for competitive advantage*. London: Pitman.
31. Vujaklija, M. (1991). *Leksikon stranih reči i izraza*. Beograd: Prosveta.
32. www.balkanmagazin.net/biznis/cid131-61614/poslovni-ambijent-i-prioriteti. Retrieved on September 23rd 2016



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ENHANCING AGRI-COMPETITIVENESS: A COST-BENEFIT ANALYSIS OF RASPBERRY PRODUCTION ON A FAMILY FARM

Povećanje agrokurentnosti – cost-benefit analiza
proizvodnje maline na porodičnom gazdinstvu

Abstract

The research presented in this paper shows the efficiency of resource utilization on small family farms, where business activities are highly dependent on natural factors. The production process is mainly labor-intensive, while investments in fixed assets are frequently hindered by difficulties in securing finance. Serbia has not used its high potentials to a sufficient extent owing to the inadequate application of agronomic measures.

The impetus for the production of high-quality grade one raspberries, which command the highest price, leads to an increase of yield from 7t/ha to 13t/ha as a result of the application of adequate agronomic measures.

The goal is to grow sufficient quantities of high-quality raspberries.

Keywords: *family farm, raspberry, production, competitiveness*

Sažetak

Istraživanje u ovom radu prikazuje efikasnost iskorišćavanja resursa u malim porodičnim gazdinstvima. Poslovne aktivnosti su visoko zavisne od prirodnih faktora. Proces proizvodnje je uglavnom radno-intenzivan, dok su ulaganja u osnovna sredstva često otežana usled otežanih uslova finansiranja. Velike potencijale Srbija nije dovoljno iskoristila zbog neadekvatne primene agrotehničkih mera.

Stimulus za proizvodnju kvalitetne maline prve klase, čija je cena najpovoljnija, dovodi do povećane proizvodnje sa 7t/h na 13t/h zbog primene adekvatnih agrotehničkih mera.

Cilj je proizvoditi dovoljne količine visokokvalitetne maline.

Ključne reči: *porodično gazdinstvo, malina, proizvodnja, konkurentnost*

Introduction

Consumers' demands for high-quality products impose the requirement for well-coordinated production and consumption. Future considerations should focus on the marketing concept, as it is becoming a factor in increasingly wide vertical and horizontal cooperation between growers and traders. Organizations need to address the challenges of speed, convenience and reliability. This can help reduce costs, increase productivity and reduce risk, thus achieving competitive advantage, as concluded by Walker et al. [14]. The suboptimal production structure in Serbia is another hindrance to competitiveness. The problem of small family farms in the transition period is well-known in development policy as a crucial problem in the country. The process of transforming these family farms into market-oriented farms with sustainable potential should be supported through special measures, accession and transition assistance programs (SAPARD and IPARD).

In Serbia, small family farms with modest development potential comprise the majority of all family farms. These farms are at a high income risk owing to the increasing competition on the domestic market and limited opportunities for employment and generation of external income. The key risks to further agri-product marketing are inefficient production practices. Consistent policies on efficient marketing channels at the macro and micro levels, as well as the supply-demand balance, are matters to be researched further according to Revoredo-Giha & Leat [10].

The complexity of marketing channels is also reflected in the complexity of performance measurement across the supply chain as proved by Aramyan et al. [2].

Local marketing channels insist on shorter distances from producers to consumers, thus contributing to the overall development by increasing local farmers' earnings, enhancing the rural economy and the overall utility to consumers who, in the globalization era, prefer locally sourced food [3], [6], [7].

The integration of family farm marketing channel members

The family-based farming model is a problem faced by all countries, given that its form has never been ideal anywhere. The agri-industrial business and family farms are increasingly inextricably linked. The family-based farming model is inevitably becoming integrated in agri-industrial business developments, which implies the increasing employment of capital in food production. Risks, such as production, institutional or price risks, are being overcome through the pooling of smaller producers. Competitiveness and higher market share are achieved by producers' pooling into larger groups in order to ensure an enhanced marketing approach and respond to the demands of the contemporary market, or marketing activity management models. This trend is evidenced by an analysis of the family farm of Mr. Ljubinko Tomić, based in Užice, who is a member of the marketing channel of a complex agribusiness system operated by the company Yugent Food (see Tables 3, 4).

Table 1: Characteristics of the family-based farming model

Traditionally oriented farmers	Entrepreneurially oriented farmers
Usually small farm and cautious expansion	Markedly large farm
Caution when incurring debt	Extensive capital borrowing
Higher stability in difficult times	Risk of over-indebtedness
Preference for land ownership over lease	Land lease and ownership equally desirable
Production diversification	Specialized and commercialized production
Lower sensitivity to market shocks	High sensitivity to market shocks
Continuity of family identity on the farm	Farm is not the family's permanent base
Higher level of intergenerational cooperation in the household	Intergenerational competition on the farm
Farm preserved for one heir	Self-establishment of a possible successor to pursue the parents' occupation
High level of loyalty and environmentally-friendly behavior	Lower level of loyalty to the community and profit orientation

Source: [15].

Only strong agri-industrial business and food industry can be economically attractive business partners to a small family farm. Through integration, small producers obtain secure access to the market, as well as to new technologies and knowledge needed to improve their production. Within the company Yugent Food, taken as an example of an agribusiness system, a department for cooperation with individual family farms has been established. Shared interests have been identified with 851 farms. Producers are offered fertilizers and plant protection products used in raspberry production. This business relationship is in the interest of both partners, as it is based on mutual trust and strong ties, while the opportunities presented by such cooperation are virtually inexhaustible.

In a new agrarian strategy, an individual family farm should be the pivot of future development (see Table 1).

Economically sound development is the only path to be pursued by small family farms. Fierce market competition requires strong and capable businesses. A family farm as a stand-alone unit is not capable of approaching the market on its own.

The contemporary business environment requires prompt responses by businesses. Importers must also export in order to secure foreign currency for further purchases. Both large and small farms must adapt by building economic ties, thereby improving their operations. In Serbia, priority was formerly given to large agri-industrial enterprises, owing to their higher productivity and efficiency. Using the example of small producers tied to the company Yugent Food, we will demonstrate that small family farms are capable of becoming vibrant specialized producers. The trust that forms the basis for the cooperation between small family farms and the company will contribute to increased commodity production. At present, the major problems include financing current production. The pricing policy requires review and modification. To date, it has been discriminatory and based on rigorous price control. Managers who build teams ready for cooperation and

entrepreneurship will be able to adapt to the environment and market conditions.

The potential for raspberry production on family farms – a cost-benefit analysis

Raspberries are among the key export products and constitute the backbone of rural development in certain areas. Serbia is one of the world's leading raspberry producers and accounts for about one quarter of the global output. An analysis of export and consumption reveals a trend of production stagnation from year to year, accompanied by price growth. The conclusion is that, owing to insufficient raspberry production volume, prices are growing, resulting in an inability to increase raspberry sales for human consumption for economic reasons. In addition to the insufficient production volume, the focus should be on the modalities of raspberry production, purchase and marketing.

The overview shown in Table 2 gives rise to the conclusion that, despite the tendency toward increasing plantation areas and the number of fruit-bearing stems, the yield mainly remains unchanged or declines. This indicates Serbia's high potentials, as yet underutilized owing to the inadequate application of agronomic measures. Export stagnation is also caused by the insufficient quantities produced.

The research data based on analysis of a specific family farm indicate the possibility of increasing the yield per hectare (see Table 5). The core business activity of the observed farm is livestock farming, more specifically sheep rearing. Its ancillary activity, fruit production, comprises plum and raspberry production. Sheep and lambs are sold through brokers and to natural persons. 99% of the raspberry output is sold to the cold store operator Yugent Food. The farm retains about 1% of its livestock and fruit output for subsistence consumption and craft food production. Its development vision for the 2012–2017

Table 2: Raspberry yield in the 2003-2012 period

Crop year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Yield per ha, in t	4.8	5.7	5.5	5.3	5.3	5.7	5.8	5.5	5.8	4.5
Plantation area, in ha	16,354	15,995	15,413	15,024	14,496	14,680	14,957	15,171	15,354	15,748

Source: The author's adaptations based on [12].

period is to increase the sheep headcount by 11. As its greatest weakness, the farm highlights the lack of its own funds and labor force within the household. Unfavorable location is another hindrance to the farm's operation. The government's and its agencies' uncondusive attitude to farm growth and development is a major threat.

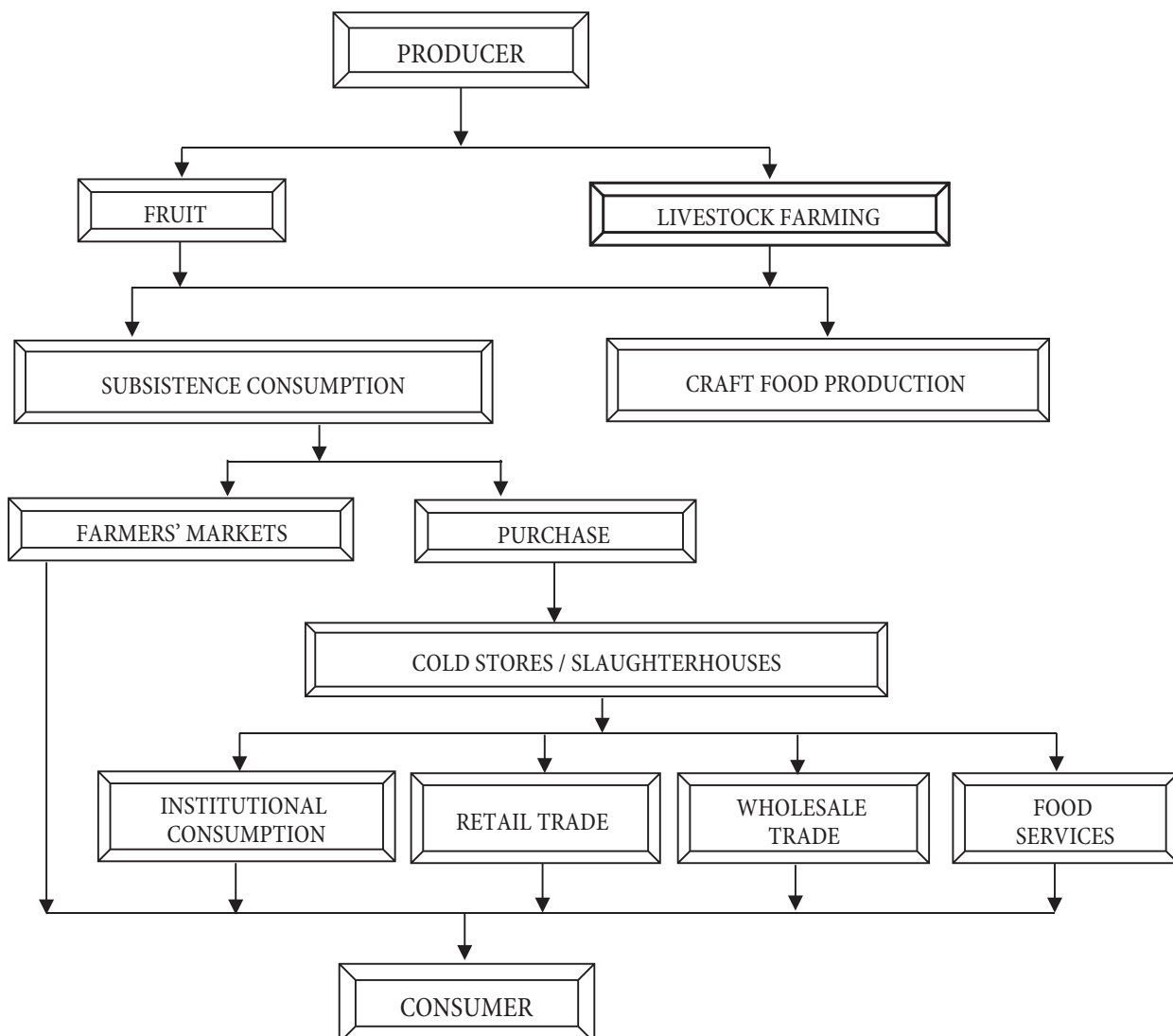
The farm sees its environment-friendly products and their price competitiveness as a strength in its further development. Owing to the well-organized marketing channel, the enterprise sees great export possibilities as an opportunity for further farm growth and development. The farm has identified the need for certification (EUROGAP); however, the cost of maintaining the certificate is too high. The farm's machinery is obsolete. Small machines are

used due to the terrain features (hilly and mountainous area). The farm has a passenger vehicle and one tractor.

Sales of the farm's outputs takes place without difficulties. Raspberries account for 84% and lambs for 16% of the total planned farm revenue in 2016. Plums are used only for on-farm subsistence consumption. The planned sale's revenue in 2016 amounts to EUR 10,500 for raspberries, and EUR 2,100 for lambs. The goods are sold at market prices, and the introduction of additional products is not planned.

The business goal is to generate revenue exceeding labor costs. Revenue depends on raspberry price in the global market, as well as on increased yield per hectare. If yield per hectare increases, costs decrease. In raspberry

Figure 1: The selected family farm's marketing channel



Source: The author's adaptations based on [9].

production, success is achieved by reducing the plantation area and maximizing the output on the existing areas under crops, as this facilitates savings in labor costs for plantation maintenance and operation.

The farm has 80 ares of arable land under raspberries. The cost-effectiveness of raspberry production will be shown by a cost-benefit analysis (see Tables 3, 4). The method employed is net present value (NPV). The profitability of the investment in raspberry production will be indicated by the positive or negative NPV.

Table 3: Raspberry sale revenue on the selected farm in 2013

Crop	Quantity sold, kg/are	Plantation area (ares)	Total quantity sold (kg)	Farm gate price of Willamette raspberries, EUR/kg	Total sale revenue (EUR)
Raspberry	69	80	5,520	1.75	9,660

Source: [9].

Table 4: Raspberry production costs on the selected farm in 2013

Type of cost	Plantation area 80 ares, in EUR
Annual maintenance and harvest costs, 80 ares	3,780
Annual plantation depreciation cost, 80 ares	420
Total quantity produced, kg/are	70
Total annual cost, 80 ares	4,200
Unit cost, EUR/kg	0.75
Cost of raspberries sold	4,140

Source: [9].

The benefits derived from the investment in raspberry production are calculated by means of the following formula:

$$NPV = \sum_{n=1}^{12} \frac{B_n - C_n}{(1+r)^n}$$

where

C_n – expected raspberry production costs,

B_n – expected raspberry sale revenue,

r – interest rate.

The analysis considers a period of 12 years, assuming that activities are carried out without major oscillations. The useful life of a raspberry plantation is 15 years. The full yield potential is achieved in the third year after the plantation is set up; hence, the period under consideration is 12 years. More specifically, after 12 years, the family farm concerned will need to replace the entire plantation. The data from Tables 3 and 4 will be used. Rate r , whose

level depends on the subjective assessment of the future net benefit, will stand at 8% [4, p. 198].

By inputting our data in the net present value formula, where the expected raspberry production costs amount to EUR 4,140, and the expected revenue to EUR 9,660, we come to the net present value of EUR 5,111 in the first year of raspberry sale, while the costs-to-revenue ratio stands at 2.3, which is higher than zero, thus demonstrating that raspberry production in future years is profitable (see Tables 3, 4). A risk may lie in market saturation resulting from raspberry hyperproduction, and failure to meet the EU standards. If an attempt is to be made to reduce future raspberry marketing risks, then the production process should be enhanced and adequate soil supplementation and chemical protection should be applied, as this would safeguard raspberry producers' market interests. Increasing yield per hectare reduces raspberry production costs, as yield stands in an inverse relationship to costs (see Table 5).

The calculation based on the agri-environmental conditions present in Western Serbia for the Willamette variety, assuming planned budgeting and agronomic measures are properly applied, differs dramatically from the calculation based on the Serbian family farms' agricultural practices. It can be presented as follows:

Table 5: Calculation of annual costs for the agri-environmental conditions concerned

Type of cost	Plantation area 80 ares, in EUR
Annual maintenance and harvest costs, 80 ares	7,960
Annual plantation depreciation cost, 80 ares	747
Total annual cost, 80 ares	8,707
Unit cost, EUR/kg	1.09
Quantity of raspberries produced, kg/are	100
Quantity of raspberries sold, kg/are	99
Total cost of raspberries sold, EUR	8,633
Total revenue from raspberries sold, 80 ares	13,702

Source: [9].

The data presented above lead to the conclusion that the cost per kilogram is higher by 0.34 EUR/kg. The cost increases as a result of additional investments in the production process, which results in raspberry yield increase from 70 kg/are to 100 kg/are. Owing to the higher produce quality, a higher price is accomplished in the global market and the sale is secured. Therefore, the total

revenue stated in Table 5, showing the calculation for the relevant agri-environmental conditions, will be higher.

Agri-competitiveness and cooperation among raspberry marketing channel members

In Serbia, raspberries are processed in industrial facilities and on farms, with the processing industry development level being very low. Raspberries are mainly processed in cold stores to produce semi-finished products, which are subsequently exported for further processing.

In rural areas, agricultural operations are predominantly of an extensive character and, from the aspect of income generation, subsistence-oriented, primarily aimed at meeting own needs, with the surplus being marketed through local farmers' markets; however, orders by local traders are also observed.

In the raspberry production sector, direct marketing channels are established by farmers and cold store operators. Cold store operators, in our case Yugent Food, have the role of traders. Yugent Food, through its intermediation, arranges regular exchange between the production and consumption sides. Yugent Food builds cooperative relationships with farmers, who represent the main source of raspberries, thus enhancing its capacity to meet the high expectations of its global customers. The relationship of cooperation is a consequence of the customers' stringent requirements which bind all marketing channel members through accountability. Raspberries are delicate and their quality begins to deteriorate already at the moment of harvest. The fruits lose their firmness, molds develop owing to the juice being released, and the fruits eventually rot. All marketing channel members aim to sustain fruit quality.

A more prominent role of fruit growers in the industry and trade domain would ensure competitive advantage and the proportionate growth of farm gate and export prices. Through analysis of a case study, this research has demonstrated that the opportunities offered by market-oriented operation require that all marketing channel members undergo a shift of their business orientation toward marketing-oriented agri-business, thus broadening the perspective of the marketing channel, which has so far had a distribution role. The presence of a degree of

competitiveness between cooperating production and trade companies with a view to meeting consumers' needs is a guideline for a new agri-business system. In line with the new market requirements, producers will undergo the greatest changes. The analysis of the observed family farm, which is a supplier to a complex agri-business operator – Yugent Food – provides possible guidelines for the producer restructuring process. The selected family farm operates with obsolete machinery and without certificates. It has identified an opportunity in Yugent Food's well-organized marketing channel. This company has the characteristics of a modern agri-business system, since it performs an interpersonal, interlocal role, as well as circulation, storage, safekeeping, processing and packaging of agricultural products. A cost-benefit analysis based on the agri-environmental conditions present in Western Serbia, assuming planned budgeting and agronomic measures are properly applied, indicates a dramatic difference in relation to the calculation based on the Serbian family farms' agricultural practices.

The key conclusion of the research conducted is that the Serbian agriculture should secure its survival in the global competitive market by synchronized production and its integration, to the highest extent possible, with the stakeholders in agri-food products circulation within short and long food supply systems, following the model of developed economies.

References

1. Andrić, N., Tomić, D., & Vlahović, B. (2011). Neki aspekti finansiranja ruralnog razvoja Evropske unije. In D. Tomić, M., Ševarlić, & S. Zekić (Eds.), *Agrarna i ruralna politika u Srbiji – nužnost ubrzanja reformi*, pp. 11-24, Beograd, Novi Sad: DAES.
2. Aramyan, L. H., Alfons, G. J. M., Lansink, O., Van der Vorst, J. G. A. J., & Kooten, O. (2007). Performance measurement in agri-food supply chains: A case study. *Supply Chain Management: An International Journal*, 12(4), 304-315.
3. Brown, C., & Miller, S. (2008). The impacts of local markets: A review of research on farmers markets and community supported agriculture (CSA). *American Journal of Agricultural Economics*, 90(5), 1298-1302.
4. Čejvanović, F., & Rozman, Č. (2004). Finansijska ocena konkurentne sposobnosti voćarske proizvodnje u Bosni i Hercegovini. *Ekonomski anali*, 161, 193-203.
5. Howieson, J., Lawley, M., & Hastings, M. (2016). Value chain analysis: An iterative and relational approach for agri-food chains. *Supply Chain Management: An International Journal*, 21(3), 352-362.

6. Marsden, T., Banks, J., & Bristow, G. (2002). The social management of rural nature: Understanding agrarian-based rural development. *Environment and Planning A*, 34(5), 809-825.
7. Martinez, S., Hand, M., Da Pra, M., Pollack, S., Ralston, K., Smith, T., Vogel, S., Clark, S., Luanne, L., Low, S., & Newman, C. (2010). *Local Food Systems: Concepts, Impacts, and Issue*. Economic Research Service, U.S. Department of Agriculture, No. (ERR-97).
8. Petrović, S., & Leposavić, A. (2011). *Malina – nove tehnologije gajenja, zaštite i prerade*. Čačak: Institut za voćarstvo.
9. Radosavljević, K. (2015). *Strategija razvoja kanala marketinga u agrobiznisu Republike Srbije*. Unpublished PhD thesis. Kragujevac: Ekonomski fakultet, Univerzitet u Kragujevcu.
10. Revoredo-Giha, C., & Leat, P. (2013). Risk and resilience in agri-food supply chains: The case of the ASDA PorkLink supply chain in Scotland. *Supply Chain Management: An International Journal*, 18(2), 219-231.
11. Serbia Investment and Export Promotion Agency (SIEPA). *Doing Business in Serbia 2015*. Retrieved from <http://siepa.gov.rs/en/>
12. Statistical Office of the Republic of Serbia. *The Statistical Yearbooks of RS (2003-2012)*. Retrieved from <http://www.stat.gov.rs>
13. Stojanović, Z. (2007). The agricultural policy changing directions and implications on agricultural and rural development in Serbia. In G. Rikalović & S. Devetaković (Eds.), *Economic policy and development*. Belgrade: Faculty of Economics, University of Belgrade.
14. Walker, B., Bovet, D., & Martha, J. (2000). Unlocking the supply chain to build competitive advantage. *International Journal of Logistics Management*, 11(2), 1-8.
15. Zakić, Z., & Stojanović, Ž. (2008). *Ekonomika agrara*. Beograd: Ekonomski fakultet, Univerzitet u Beogradu.



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www.sava-osiguranje.rs



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