UDC 65 ISSN 0353-443X

YEAR LXV SEPTEMBER - OCTOBER 2017

Ekonomika preduzeća

Serbian Association of Economists
Journal of Business Economics and Management

NOVI BEOGRAD · OMLADINSKIH BRIGADA 86

+381 11 205 40 40 · www.west65.rs

UDC 65 ISSN 0353-443X

EP Ekonomika preduzeća

Journal of the Serbian Association of Economists and Serbian Association of Corporate Directors
Founded in 1947 in Belgrade
Year LXV September-October
No. 5-6 Page 331-426
Publisher: Serbian Association of Economists
Editorial Office and Administration
Dobrinjska 11/1
Bulevar Mihajla Pupina 147
11000 Belgrade, Serbia
Phone: 011/264-49-80; 361-34-09
Fax: 011/362-96-89
Account No: 205-14935-97 Komercijalna banka
Web: www.ses.org.rs
E-mail: office@ses.org.rs

Printing office
"Kuća štampe" 011 307.5.307
stampanje.com
Printed in 200 copies
The journal is published four times a year

Just like wisdom, science cannot be created in a day. It takes time and effort. Given the fact, it was our pleasure and honor to welcome a distinguished professor *Lj. Madžar* to present his article in the *Introduction* section of this edition of *Ekonomika preduzeća*. Growth is one of the greatest concerns in macroeconomics. In his cognizable manner, the author takes us along a voyage through history in order to be able to understand better the roots of sclerotic growth in post-socialist countries.

Employment is the second keyword in macroeconomics. Readers of *Ekonomika preduzeća* will easily spot the strand between the second *Introductory paper* and the previous polemics about labor market statistics in Serbia carried on by *P. Petrović* and his co-authors on one hand, and *M. Arandarenko* with co-authors on the other. In this edition, *M. Kovačević*, Director of the Statistical Office of the Republic of Serbia, together with *V. Pantelić* and *D. Aleksić*, continues this interesting story that has many layers and perspectives. The authors made an effort to present rather technical but useful details. Truth is never simple and at one pole. We strive to be a journal that promotes the values of scientific arguments, not the power of position, and thus welcome readers to be the judges in this truly interesting and important debate.

In the first paper in the *Finance* section, *K. Đulić, L. Barjaktarović, R. Pindžo* and *A. Vjetrov* analyze the pecking order theory implementation and both the internal and external factors influencing the companies' debt policy on a sample of 65 companies in Serbia surveyed during 2015. The authors' results confirm the already identified structural imbalance of Serbia's economy, and show that the restrictive and costly credit policy of the banks in Serbia influences the companies' limited access to external sources of capital. In the same section, *M. Lazarević* examines the treatment of credit risk in the post-crisis reform of the Basel rules. The author reveals major deficiencies and anomalies in calculating risk-weighted assets that the empirical analyses have demonstrated and elaborates the need for radical modification of the credit risk framework.

In the *Transition and Restructuring* section, *S. Rapaić* explores whether the FDI inflow of over 20 billion euros contributed to the economic development of Serbia in the 2001-2013 period. The paper tells an interesting story about privatization in Serbia, foreign capital and the gap between desirable and actual outcomes.

In the *Information Technology* section, a duo of authors – *A. Zečević* and *J. Radović-Stojanović* analyze the usage of information and communication technologies in enterprises in Serbia in comparison with the EU Member States. In this paper, the readers can find data proving that the accomplished level of the usage of ICT in enterprises in Serbia is above the European average, yet still below the level of the developed EU economies. When cloud computing services and the development of web-based sales are considered, Serbia is still lagging behind the analyzed sample.

In the first paper in the *Marketing* section, *A. Đorđević* and *V. Marinković* analyze the hospitality industry in Serbia with particular focus on boutique tourism. Empirical data are the basis for econometrical modeling to identify satisfaction drivers of vacation-traveling tourists. In the second paper in this section, *I. Domazet* and *I. Stošić* explore the basic characteristics of competitive forces in the after-sales market of motor vehicles in Serbia. They pointed out the role of after-sale services during the period of use of vehicles in the demand dynamics.

Prof. Dragan Đuričin, Editor in Chief

ORIGINAL SCIENTIFIC PAPER
UDK: 330.341:32
DOI:10.5937/EKOPRE1706331M
Date of Receipt: September 12, 2017

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THE PARADOX OF FAILED GROWTH IN THE POST-SOCIALIST ECONOMIES – With Reference to Traits Characteristic of Serbia –

Paradoks izostalog rasta u postsocijalističkim privredama – Sa osvrtom na osobenosti karakteristične za Srbiju –

Abstract

The paradox to which this paper is devoted consists in the largely unexpected fact that the rates of economic growth achieved in the post-socialist economies, following their privatization and transition to a market based institutional framework, appeared to be significantly lower than the rates achieved during the most successful episodes of the socialist era. In the general and even in the large segments of the professional public the impression is created that the demised collectivist institutional arrangement of the socialist past is more efficient and, particularly, dynamically more propulsive than the market economy of the contemporary post-socialist institutional order. This misperception is characterized as damaging and growth constraining because it distorts the collective evaluation and electoral preferences making it extremely difficult and occasionally impossible to create a development promoting, propulsive institutional system compatible with the foundations of a market economy. The delusion of the superior socialist development performance is dispelled by pointing to the unsustainability of the temporarily fast development under the socialist system and its inherent convergence towards long run economic stagnation. This is the context in which the notorious extensive socialist development is examined as a dynamic process whose rhythm of growth converges to the rate of expansion of the slowest growing production factor. This property of the development trajectory is revealed as the reason on account of which the final result of extensive development is the long run economic stagnation at the best and even less favorable dynamic scenarios in more likely macroeconomic constellations.

Keywords: *sustainability of development, extensive development, technological progress, institutional system, the inefficiency of the collectivist arrangements, collective evaluation of growth experience, electoral preferences*

Sažetak

Paradoks kome je posvećen ovaj rad sastoji se u poglavito neočekivenoj činjenici da su se stope privrednog rasta ostvarene u postsocijalističkim privredama nakon njihove privatizacije i prelaska na tržišno zasnovan privredni poredak pokazale znatno mižim od stopa realizovnih tokom najuspešnijih epizoda iz socijalističkog vremena. U najširoj javnosti ali i u opsežnim segmentima profesionalnog sveta stvoren je utisak da je napušteni kolektivistički aranžman iz naše socijalističke prošlosti efikasniji i, osobito, dinamički propulzivniji nego tržišna privreda svojstvena savremenom postsocijalističkom institucionalnom poretku. Ova pogrešna percepcija okarakterisana je kao štetna i ograničavajuća na planu privrednog razvoja zato što deformiše kolektivna vrednovanja i elektoralne preferencije, silno otežavajući a povremeno i doslovno onemogućavajući stvaraje institucionalnog sistema koji bi bio propulzivan i pogodan sa stanovišta podsticanja privredne ekspanzije, a koji bi u isti mah bio kompatibilan sa osnovama tržišne privrede. Zabluda o tobožnjoj superiornosti razvojnog učinka iz vremena socijalizma razvejana je tako što je pokazana neodrživost brzog ali kratkovekog razvoja u okviru i uz regulativno delovanje socijalističkog sistema čije je inherentno svojstvo konvergencija ka drugoročnoj privrednoj stagnaciji. Ovo je kontekst u kome je ispitan naširoko poznati ekstenzivni socijalistički razvoj kao process čiji tempo rasta konvergira ka stopi uvećavanja najsporije rastućeg privrednog činioca. Ovo svojstvo razvojne putanje označeno je kao razlog zbog koga je konačni rezultat ekstenzivnog razvoja dugoročna privredna stagnacija u najboljem slučaju ali čak i znatno nepovoljniji dinamički scenariji u drugim, nesumnjivo verovatnijim makroekonomskim konstelacijama.

Ključne reči: *održivost razvoja, ekstenzivni razvoj, tehnički progres, institucionalni sistem, neefikasnost kolektivističkih aranžmana, kolektivna evaluacija razvojnog iskustva, izborne preferencije*

Introduction

It is not just a matter of sophisticated economic theory but, by now, a widely accepted article of faith of the informed general public that the market economy is undoubtedly more efficient and more productive than the economy based on hierarchically originated commands and administrative regulations. Automatic coordination of economic decisions deeply grounded on properly structured motivation impulses and smoothly exploiting an unsurpassable mass of appropriate information is clearly superior to the direction of economic processes by the immediate orders and endeavors to allocate resources directly, by estimating the incomprehensively large quantity of vastly differentiated social needs.

Yet, recent experiences arising from post-socialist structural shifts and observed tendencies seem to contradict, at least in some constellations and during periods of limited duration, this generally held belief. And, indeed, the belief deeply rooted in scientific considerations and corresponding, multiply corroborating empirical findings. The times of socialist development with particularly marked industrialization drives contain the periods of extraordinarily fast economic growth, impressive expansion of employment, extremely high savings and investment rates and regular yearly increase in incomes which predictably produced equally beneficial increase in the standard of living. Post-socialist economies plummeted to the incomparably lower rates of growth of the economy, displayed disturbingly high rates of unemployment, drastically reduced rates of investment and, particularly, savings and sunk into the murky waters of uncomfortably high foreign indebtedness. Some vital economic activities, such as housing construction, whose cardinal and seemingly universal importance for the welfare of the populace is plainly evident, were by far more developed during socialist times than they are now; the housing area delivered yearly in some periods of socialist construction was, in *per capita* terms, depending on years selected for comparison, between three and seven times bigger than after the demise of socialism. Numerous public opinion surveys show almost in one voice the conviction of the broad strata of the population that socialist times had been incomparably superior to the post-socialist situation and a distinct nostalgia for socialist arrangements comes visibly to the fore (e.g. [6]).

In a recently completed work, prepared as background paper for the inaugural address on the occasion of the election for the corresponding member of the Slovene Academy of Sciences and Arts, this author offered a comprehensive critique of the forcibly imposed, democratically nonlegitimized collectivist systems, with extensive argumentation of the statement of their fundamental and ultimate inefficiency. The information inadequacy of such systems is strongly pointed out, both in the sense of such systems not being capable of producing required volume and, particularly, kind and quality of information and in the sense of overcentralized and politically directed systems not being able to collect and to purposefully use the scant information made available to the decision making loci. Motivation is equally vigorously emphasized. Coercion can never extract as much devotion to the task and as much effort as properly structured motivation which stirs the action of free men, the agents who are induced to working for their own benefit. The inability of the collectivist systems to generate technological and other innovations and the incapability of such systemic creations to learn sufficiently fast is also pointed out. They are not only weak in creating the new technological solutions but are also sluggish in utilizing the existing technology long used in other, more developed economies. And with low, occasionally bent down to zero, rate of technical progress, economic development at reasonably high rates is unsustainable.

For economic development to unfold regularly and at a sufficiently high rate the essential prerequisite is civic, particularly economic, freedom reliably protected by the rule of law. The absence of the rule of law is the gravest weakness of the collectivist systems based on coercion and reducing a large part of communication among the economic agents to issuing the orders and passing the reports on their execution. Without rule of law the system is burdened with terrifying uncertainty and converted into rule of men over men. In such systems no one is safe and all are threatened, including those at the very top of the social pyramid. Such a lawless set-up predictably

generates massive purges (*csistkas*) as a predictable manner in which the power holders protect their own body and limb. Purges are a regular, structurally determined and foreseeable phenomenon in such systems and what kind of more drastic deformity of an institutional arrangement can be imagined than such systemic annihilation of the precious human material. In the expanded version of the paper a number of notable, highly placed personalities, having succumbed tragically to the purges, are analyzed. Such systems have massive compulsion, rather than free cooperation based on self-interest, as their *modus operandi*. Millions of prosperous and even poor peasants, *kulaks* and others had been executed because they defended their properties and resisted the collectivization. Whole nations have been transferred from their homelands to distant, inhospitable Siberian areas. It is evident than *not all* among the expelled ethnic entity could be responsible for anything; it then follows that innocent people are subject to drastic punishments and that the very idea of justice is done away with. If and when institutional systems are at such unbelievable odds with justice, individuals don't get what they deserve and – taking the other side of the coin – they are exposed to severe punishments which they don't deserve. With such an extreme dissociation of act and consequences, including the separation of efforts and rewards, no system could under any circumstances come out as efficient.

There is also a direct ruin of the social morals. Without the rule of law providing a reliable protection of individual rights and liberties, so that power holders can arbitrarily handle and treat any individual, including forcing him into all kinds of ethically impermissible acts, such as arbitrary accusation of neighbors and acquaintances, denunciations and extortion of false admissions, sticking to ethical principles becomes *very expensive in terms of sufferings and even survival*, and, no wonder, the decline of morals, the ruin of the very ethical base of the society inevitably follows. Children denouncing parents – the case of famous Pavel Morozov and the praising of such parental treasons by such celebrities as Gorky – become a steady and ordinary part of the ethical landscape of the society [5, p. 367]. Interdependencies between the morals of a society and its economic potential call fir and have given rise to thousands of books and papers, but here it will suffice to state that with such eroded morals, whereby the erosion is functionally determined by the structure of institutional order and, in particular, by the political set-up of the society – any chance for sustainable long run development vanishes for good.

The Quandaries of mobilization and allocation of resources

Crude force and compulsion are undoubtedly instrumental in the mobilization of resources – large masses of people can be herded and relocated at will and investment can be expanded at the expense of the total consumption within the very wide limits – but such huge quantities of resources on which political directorate quite easily lays its hand are inexorably wasted to a large extent and the resulting distortion of allocation eliminates whatever effects might have been achieved by mobilization itself. In cruelly reigned collectivist systems much of what was drained out by forcible mobilization had been simply dissipated by reckless and highly irrational allocation. Yet, mobilization does remain as a very important and truly desirable function of the economic system: resources which are not mobilized and remain idle do not command any economic value. Only mobilized resources can be allocated, allocation involves mobilization as its essential, absolutely conditioning prerequisite. Self-management and other institutional peculiarities have to some extent differentiated the Yugoslav economic system in relation to the systems of other socialist countries, but that system remained a member of the family and shared with the rest some fundamental characteristics: the lack of democratic legitimacy, intensive and steady governmental intervention, installation of administrative regulations over wide areas on which markets would have performed much more efficiently and the excessive use of coercion including the forceful confiscation of properties and the well known manner of its compulsory introduction at the very beginning of what later came to be called *industrialization of the country and socialist construction*. In thorough understanding of Yugoslav institutional realities much can be learned from studying

of other socialist systems, including their inclination toward centralism and even central planning.

With systems which produce small or negligible quantities of innovations, i.e. which learn slowly or don't learn at all, technical progress practically does not arise as a determinant of development and the drivers of growth are practically reduced to raw and crude physical amassing of the factors of production – various categories of capital and labor. The important fact is that economic progress can in these ways – by mobilizing and putting to productive use large quantities of production factors and thus by consuming immense quantum of inputs – achieve an impressive, literarily fascinating acceleration of growth and produce unprecedentedly big rates of growth, but that growth is *not sustainable*. The basic proposition of the theory of economic growth has it that the sustainable rate of growth, i.e. achievable in the long run, if depending only on the mobilized quantities of the production factors and deprived of the precious component of the technical progress, is *equal to the rate of growth of the slowest expanding factor.* Growth depending on the increasing quantities of these factors, stripped off of the beneficial impact of technological modernization, is traditionally called *extensive growth*. The tragedy of extensive growth consists in the sad fact that the economy is doomed to grow at the rhythm of the slowest growing factor in the long run. The best scenario in the extensive growth story is the one in which population, and by implication the labor force, appears to be the slowest growing factor, in which case the long run stagnation is the mirror of the future of an economy. Other scenarios are clearly even less favorable – they are articulated by the long run decline of the income *per capita*. Despite the impressive development spurts over periods of limited duration, extensive growth is an abysmally bad option as it leads into secular stagnation in the most favorable case.

Costs in terms of unbelievable numbers of human lives are the next huge component of cost that has not been and never will be accounted for. Some numbers are given in the previous subsection. There are many sources containing the estimates of the lost lives and the data contained in these sources differ widely. But whatever estimates are taken, they are horrifying. Along with all wide differences they display a common characteristic: they are very, very large and almost stupefying. The need of providing illustrative substantiation bears adding a few facts in this context, too. Cohen [1, pp. 323-4] – notices that only in the period 1936-1939 7-8 million people were arrested, out of which 3 million were shot or perished in other ways. The Party itself suffered annihilating blows. Out of 2.8 million of Party members in 1934 more than 1 million were arrested of which 2/3 were executed. Out of 1,966 delegates of the XVII Party congress in 1934 1,108 were arrested with majority of them having been executed. Out of 139 members and candidates of the Central Committee of the Party 110 were executed or forced to commit suicide in 1934. Cohen [1, p. 324] states that the Bolshevik Party had been exterminated and replaced with a new, completely different party composed of obedient performers. Solzhenitsyn has estimated the *total* number of people who suffered Stalinist terror to 60 million [2, p. 477].

Among the conspicuously neglected and, indeed, poorly understood aspects of the appalling irrationality of the system defined on the highest level – it could be called *macro social irrationality* – the way in which wars had been conducted by the then existing Soviet Union. The military strategy of the supreme leadership was characterized by a very peculiar attitude towards the risk. As opposed to Western Allies the Soviet leaders and commanders have indulged into utterly extreme operations recklessly sacrificing hundreds of thousands lives of the military. The cautious attitude of the Western allies, disinclined to launch ambitious and dangerous operations and hesitating to open the second front on the West had for long been the source of serious tensions between the Soviets and the Western Allies [2, pp. 274-5]. The results are well known. The victorious USSR lost in the World War II about twice as many military lives as Hitler's Germany lost on all fronts. Another characteristic illustration of the attitude of the leadership towards human lives is the outcome of the notorious Soviet-Finish War: the victorious Red Army lost about 200,000 soldiers against 100,000 on the Finish side. These remarks should be understood in the strictly pragmatic, cost-efficiency sense; they don't touch upon the ethical side of the stance taken regarding the degree

of respect and the readiness to protect human lives. The present efficiency aspect of the issue consists simply in the horrifying cost which the authoritarian collectivist system was ready to undergo to achieve some of its objectives. With such high costs one is tempted to wonder about the worth and the justifiability of the objectives themselves, even if they appear to be reached.

The key problem in popular, and to some extent even professional, evaluation of alternative institutional orders consists in an extraordinarily skewed selectivity in observing the performance of competitive arrangements. Socialist system is under various guises and in correspondingly differentiated alternatives existed in Serbia for some half-a-century. That rather big interval of time has exhibited a multitude of development performances, starting with the glorious period 1952-1960, when the country headed the list of the fastest growing economies (Ivan Stojanović aptly called this time interval *belle époque*, and ending with the dramatic early eighties, when the country found herself at the verge of the bankruptcy and fell in a way under the guardianship of the IMF. The periods of rapid economic expansion are most deeply carved in the collective memory, the less glorious periods are largely forgotten and the socialist period as a whole comes out in the collective remembering as extraordinarily successful. The global picture is biased and unrealistic. Two important features are simply disregarded. *Firstly*, as the theory firmly establishes, the growth realized in the *belle époque*, how ever rapid and vigorous, is unsustainable; its most successful stages contain the seeds of subsequent retardation and determinants of serous crises. *Secondly*, clear signs of unsustainability have shown up during the socialist development itself: growth indicators plummeted, macroeconomic equilibria turned out seriously disrupted and pressures for major institutional changes escalated. *Thirdly*, socialist institutional machinery driving and steering growth not only demonstrated signs of an incurable illness, breaking dramatically development trends toward stagnation, but, even more disturbingly left legacies for the future. It aggravated the growth conditions in the future post-socialist period. *Mirrabile dictu*, much of what came out as unsatisfactory development performance in the post-socialist market economy *is ascribable not to the institutional arrangements of that time, but to the regulating mechanisms of the past socialist times, to the socialist systemic creations which no more exist!*

The key to understanding the hardly expected tumble of the rhythm of development following the radical institutional change consisting in the transition to some sort of a market economy is the *unsustainability of the socialist strategy of extensive growth.* It is to that delicate subject that we now turn. While the ephemerality of the extensive growth is in this section analyzed in the broad and general terms, the next section is devoted to a more detailed and analytically positioned examination of this extraordinarily significant phenomenon, a dynamic manifestation which – as far as economic development goes – determined destiny of socialist societal order. Extensive growth has, of course, been *extensively* analyzed in the literature, but one cannot escape feeling that the degree and the amount of its analysis have not reached the level of justified commensurability with its doomsday significance.

The mechanics of extensive growth and the inevitability of deceleration

Considerable stress has been laid on extensive growth here. It is therefore necessary to provide a brief theoretical sketch of its dynamics and the factors determining the changes in its rhythm with ultimate deceleration as an unavoidable result of the nature of the underlying interrelationships. The most concise, the easiest and the clearest way of laying down the pattern of extensive growth is through a mathematical model which delivers definitive and easy to comprehend results. The insights provided by the model are exact, obvious and waterproof, of course all that under a number of simplifying assumptions. As mathematics doesn't fit into this type of the paper, an effort will be made to reproduce the mathematical derivations in words.

The key element in this verbal interpretation of corresponding formulae is the rate of growth of capital. It is defined as a ratio of net investment (= accumulation), i.e. national savings and the capital itself. As national saving are a multiple of the rate of savings and national income, the rate of growth of capital, in the model based

on deducting the depreciation and dealing with net quantities, is obtained by multiplying the rate of savings with the national income and dividing this multiple by the value of capital.

Extensive growth is initiated by and boils down to a sudden and marked increase of the rate of savings. The new authorities forged through the revolution are development centered and political monopoly, a part of their definition, enables them to rise the rate of savings abruptly and vigorously; indeed, such dramatic increase of the part of national income taken aside for capacity expansion by the virtue of definition raises the rate of savings and thereby, again by the very definition, the rate of growth of capital. Such an abrupt and strong increase of the rate of growth of capital induces the process of its gradual but sustained *decrease*. Yes, such a discrete upward shift of the rate of growth of capital becomes the cause of its subsequent continuous decline. This is the essence of the lack of sustainability of extensive growth: as *the rate of growth of the rate of growth of capital* is, for a newly fixed saving rate, equal to the difference between the rates of growth of the national income and that of the capital, discrete increment of the latter makes *the rate of growth of the rate of growth of capital* negative. That really boils down to the above mentioned statement that abrupt, once-and-for-all increment of the rate of capital growth becomes the driving cause of its continuous decline. Extensive growth predictably tends to secular stagnation. All this happens in a set of circumstances in which capital is the fastest growing production factor, which also could be taken as a part of the definition of the extensive growth.

The model is transparently generalized by introducing additional factors of production, additional to the capital and labor which conventionally figure in most models of economic development. In further working out of these models economists have introduced additional factors such as land, a summary variable for the versatile collection of natural resources. In such a generalized setting little is changed, but one insight comes forth as decisive: in the model of growth based exclusively on the expansion of the factors of production the long run, *steady state rate of growth of the national income comes out equal to the slowest growing production factor.* Taking roughly *per capita* income as a sort of indicator of social welfare and a general goal of development policy, the best long run (*steady state*) this generalized model can deliver is *stagnation of per capita income*. If the slowest growing factor is not population-cum-labor force, but any other factor, the steady state rate of growth will be equal to the rate of such slowest growing factor, that rate will be less than the rate of population growth and one arrives at a macroeconomic set-up of long run or *secular regression*. The model turns into an analytical picture of long run decline, with permanent deterioration as the unavoidable destiny of the macroeconomic system (defined as the set of interconnected parts making up the economy as a whole).

The next easy statement refers to the functional requirements appearing as the necessary conditions for sustainable, steady state *growth*. These consist in the necessity for the system to secure a positive rate of technical progress defined as the rate at which national income would grow with fixed quantities of the production factors; clearly, such growth must be due to uninterruptedly increasing efficiency in the form of equally continuous accumulation of productively relevant knowledge. For the sake of brevity, conditions of regular and continuous technical progress are ultimately reducible to institutionally secured and legally guaranteed economic freedom of the largest possible number of economic agents, it being understood that the freedom must be guaranteed by the laws of the country and the legal system enforcing them and applying them to all individuals and organizations *equally*. Entrepreneurial undertakings will undisturbedly unfold only with economic freedoms secured and with proper motivation for a large number of economic units to search for new products and processes and constantly to innovate. The system as a whole learns successfully only by and through learning of autonomous units appearing as its elements.

When the rate of technical progress enters as an additive term into the formula for the rate of national income growth – the remaining part of the formula consisting of the weighted average of the rates of growth of labor and capital, with the weights equal to the elasticities of the national income with respect to those production factors – the possibility of the steady sustainable increase of income

per capita props up and one arrives to a configuration of dynamic components diametrically and fundamentally different from analogous configuration of development trends typifying the extensive development. The rate of growth of *per capita* income generated by this model containing technical growth is equal to the rate of technical progress itself divided by the share of labor in the functional distribution of income, i.e. the elasticity of the national income with respect to labor. It turns out that the rate of *per capita* growth, i.e. per worker or inhabitant (the share of the workforce in population being assumed constant) is an inverse function of the share of labor in the functional distribution of income. This result would be beautiful even if it were incorrect: in a dynamic context labor is better off the less it participates in the distribution of income, assuming that all non-labor income is entirely invested into the expansion of productive capacities. Under these admittedly restrictive assumptions, the genuine interest of labor, exemplified by the *speed* with which its income grows in time, is best served with its low, as low as possible, participation in the distribution of current income.

Going back to the extensive growth, its tragedy consists in the absence of technical progress due to the lack of economic freedom(s). With over centralized economy and its predominant if not exclusive administrative guidance, economic units do not have maneuvering space for independent deciding, the enormous mass of agents are excluded from creative experimenting and accompanying generating of new technological solutions, the system is doomed in the sense of having to rely only on mobilization of productive factors as a source of growth and at the same time doomed to a development deceleration in a somewhat longer run. Moreover, such a system generates forbidding constraints on future development, even when it unfolds within completely reformed institutional order. The public at large, and even a large part of the profession, ascribes development deceleration to this new, market oriented set of institutions, thus blocking the change and making it politically difficult to continue developing the long awaited truly decentralized order with its yet unrealized development potential. Mistaken diagnoses and erroneous analyses are not the only and probably not the most important determinant of the mistaken policies but they certainly contribute a lot to them, more indirectly than directly. A detailed analysis of the limitations of the socialist extensive growth – spelled out by the models belonging to different classes, those with fixed coefficients and the ones with possibilities of substitution between the production factors – is provided by Madžar [4, pp. 320-335].

Additional aspects and further consequences of socialist growth

The false perception of unusually rapid extensive growth realized by and within the socialist institutional order can arise from the very methodology of computing the rates of growth and could be qualified as a statistical artifact. Socialist development was typically characterized by deep and far going structural changes. Exceedingly deep structural changes imply a comparable variability of the sectoral rates of growth. Rapidly growing sectors have relatively small initial size with relatively high relative prices and high terminal values with relative prices considerably reduced. As the weights in calculating the growth rates for the economy as a whole are determined by high initial prices, the high sect oral rates get very high weights. For the same reason the slow growing sector obtain low weights. The result is an overvalued growth rate for the global aggregate relating to the entire economy.

At the end of the so determined period statistical series undergo a procedure of updating and the system of weights markedly changes. The sectors which have previously been growing at the above average rates become thus relatively abundant and command the lower relative prices while a new set of sectors coming out as proportionately scarce command high prices. The same phenomenon repeats itself with the new set of rapidly growing and large weights obtaining sectors and again there emerges a very high rate of growth for the entire economy. The successive overvaluations of the global, economy-wide rates of growth mutually build themselves upon each other with the curious result that very high rates are registered for the economy as a whole and for the entire encompassed period, with significant interim changes but not necessarily with sizable changes in the

real, say physical aggregates of the system. To illustrate this curious phenomenon, Madžar [4, pp. 293-4] has constructed a curious example of a two-period system which, having started from an assumed real term sectoral configuration, after the second period comes *back to the same configuration* – with nothing, after all, having been changed – and yet with very high rates of growth registered in the observed interim.

It must not be forgotten that the strategy of hasty growth, which has been so typical in socialist systems and which is so amenable to outings into the areas in which growth can relatively easy be accelerated, on that account alone accumulates numerous development damaging bottlenecks which eventually have to be dealt with but at disproportionately high social cost. Before the system starts threatening to break up under the pressure of accumulated bottlenecks, urgent and – because of urgency – hard – to coordinate corrective measures have to be undertaken. Considerable waste of resources is obviously implied. Nutter [7], [8] singles out excessive accumulation of inventories as an important component of this heavy social cost. As these inventories tend to be permanently tied to the frequently disturbed and policy shocks exposed production processes, it follows that a part of the statistically recorded high growth rates gets eaten up in the periods of above average changes in the development rhythm.

More generally, a high inventory-turnover ratio is a reliable indicator of the overall inefficiency of an economy. This is the place to recall once again the findings of international comparative analysis which indicate distinctly high inventory-output ratios in the socialist economies with generally known and ill-famed intolerably low standards of consumer service [3, pp. 347-362]. Shifting back and forth among various collections of permanently and pressingly growth constraining bottlenecks, with exorbitant accumulation of inventories on this and on many other accounts, creates chaotic constellations of mismatches and the, resulting deeply ingrained mess is a most unwelcome heritage hampering development for a long time after the demise of the socialist order. Here is again one of the reasons of insufficiently rapid growth of contemporary market economies which is not determined by any of their structural characteristics but has inextricable roots in the preceding collectivist order.

A much discussed and overly important phenomenon, which is both a mechanism and an aspect of extensive growth, is the, again ill-famed, mechanism of price scissors through which socialist development was to a large extent financed and which had served as a coercion based arrangement of brutal exploitation. First of all, coercion meant that the authorities had been able to fix arbitrarily price relations within very wide limits. These relations had been fixed brutally in the most exploitative way. Huge amounts of income were ultimately transferred from, anyway underdeveloped and in the largest part literally backward, rural agriculture to the socialist sector to finance ambitiously blueprinted and not happily steered industrialization.

This is a one-shot device of development strategy *par excellence*. The process of extracting income from the privately owned peasant agriculture has to come to an end because the socialist nonagricultural sector grows much more rapidly than the rural agricultural economy; the ratio between the two segments becomes more and more skewed in favor of nonagricultural socialist segment of the economy. Once that sector becomes too large in relation to agriculture, it obviously becomes simply impossible for the bulky, overgrown sector to live and develop at the expense of the relatively small, excessively diminished sector. The sheer proportion of the sizes of the two sectors eliminates this exploitative way of nourishing the state run and collectively organized part of the economy by drawing resources from an economic segment which, relatively speaking, tends towards insignificance. It should be added that, in as much as the economy acquired certain market characteristics, the exploitation of the village by the city located, urban turned and collectively organized part of the economy was to a recognizable degree facilitated by the marked differences of the market structures: highly competitive sector of the rural agriculture was confronted with the much more monopolized sector of the nonagricultural activities.

Any developing economy, even the one growing through implementation of extensive growth strategies, becomes more complex and more challenging regarding

coordination and dynamic steering. A physically enlarged economy and the one growing, among other, on that account, needs more and more decisions to be tolerably managed and to function with bearable efficiency. Some sort of decentralization becomes imperative. Haphazard and inconsistent decentralization within politically led collectivist systems creates the problems of its own and contributes to the chaos which, as a part of socialist legacy, again acts in the post-socialist development as a constraining factor. More than that, the epochal turn to market system following the demise of the socialist order creates an intensive need for new systems of coordination and steering and such fundamentally different systems cannot be created off-hand. The long time and unavoidably high risk with uncertainty could and should be seen as the reasons for the institutional lacunae which persist until the new regulating arrangements are eventually built up. Such lacunae act as an additional, independent source of growth deceleration in the post-socialist period.

Conclusion

Understanding the phenomenon of the seemingly efficient and apparently impressive socialist development is of vital importance. The reason of this importance is widely accepted and deeply rooted *false* perception of this extraordinary spectacle. Its unprecedented rhythm in some sub-periods of the socialist development has left almost indelible imprints in and on collective memory of some ex-communist societies and correspondingly the unjustified critical stance toward post-socialist market economies and accompanying democratized pluralistic political systems. That clearly has far-reaching political implications as it strongly influences collective evaluation of the alternative institutional systems and biases electoral preferences towards collectivist orders of the past. Such evaluation and the resulting political preferences are the root cause of a serious set of political constraints in the global strategic undertaking of building a genuine democratic social order and corresponding full-fledged market economy. Dispelling the erroneous perceptions of the demised socialist institutional set-up and eliminating the mirage of the allegedly superior collectivist arrangement is a matter of the highest social priority.

This paper is devoted to the wiping out of the myth of the ostensibly superior efficiency and accompanying developmental potential of the collectivist institutional arrangements. The extraordinarily fast growth in some limited time intervals of the socialist era is understandably acknowledged, but it is shown that such impressive upswing of social economic expansion are *not sustainable* and, moreover, that the clear signs of the limited duration of the socialist development bonanza have appeared even before the breakup of that collectivist order. Cutting the long story short, *socialist extensive development is not sustainable*. The very high growth rated realized during *limited* periods of socialist development are not representative and are even *less typical* of the dynamic potential of any socialist economy. A markedly lower rate of growth of a post-socialist economy could be interpreted as a sign of superior efficiency in comparison with much higher rates achieved in limited time spans during the socialist epoch. The reason is evident: as a matter of principle, the former are sustainable and the temporarily attractive rates, how ever high may not be taken as indicative of the growth potential of the socialist economies. Despite the seeming and erroneously interpreted evidence to the contrary, the market economies are not only more efficient in the conventional sense of the (static) allocation of resources but also in the more important respect of achieving sufficiently fast development which is maintainable in the long run.

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ORIGINAL SCIENTIFIC PAPER
UDK: 331.526(497.11)
331.5.024.5
DOI:10.5937/EKOPRE1706341K
Date of Receipt: July 25, 2017.

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TRENDS AND CHALLENGES IN SERBIAN LABOUR MARKET: CHANGE IN THE NATURE OF JOBS AND LABOUR UNDERUTILISATION

Trendovi i izazovi na tržištu rada Srbije – promena prirode poslova i nedovoljna iskorišćenost radne snage

Abstract

In this paper, we will continue the academic discussion started long ago [1], [2], [13], [14], [15] about the validity of employment statistics. We will present new arguments to support our previous assertions that employment has undoubtedly grown in the 2012-2016 period and that there is no room for doubt in the quality of the Labour Force Survey. In search for clues to better understand seemingly counterintuitive dynamics in Serbian labour market, we will analyse the precarious nature of recent employment growth in detail and present our findings on that subject, as well as its impact on the (in)consistency of employment trend and trends of social security contribution revenue and personal consumption.

Keywords: *Labour Force Survey, employment, quality of employment, national accounts*

Sažetak

U ovom članku nadovezaćemo se na davno započetu polemiku o validnosti statističkih podataka o zaposlenosti [1], [2], [13], [14], [15]. Iznećemo nove argumente kojima ćemo potkrepiti naše prethodno iznete tvrdnje da je zaposlenost nesumnjivo porasla u periodu 2012-2016. i da nema prostora za sumnju u kvalitet Ankete o radnoj snazi čiji kvalitet Petrović et al. uporno pokušavaju da ospore. Još jednom ćemo pokazati da Petrović et al, u pokušaju da diskredituju Anketu o radnoj snazi, a samim tim i zvaničnu statistiku, koriste neuporedive serije podataka iz Ankete, ignorišući pritom ostale statističke izvore koji potkrepljuju ocene zaposlenosti dobijene iz Ankete. Bavićemo se detaljnije prirodom povećane zaposlenosti, čime ćemo objasniti delimičnu nekonzistentnost između rasta zaposlenosti i BDP-a. Pokazaćemo da je netačna tvrdnja koju Petrović et al. iznose o neskladu između rasta zaposlenosti i privatne potrošnje, odnosno doprinosa od socijalnog osiguranja. Ukazaćemo i na problem nedovoljno iskorišćene radne snage.

Ključne reči: *Anketa o radnoj snazi, zaposlenost, kvalitet zaposlenosti, nacionalni računi*

Introduction

Public discussion on recent labour market trends in Serbia, initiated by the Fiscal Council, i.e. its Chairman Prof. Pavle Petrović and his coworkers a few years ago, has not ceased yet. While Petrović et al. [14], [15] firmly dispute the reliability of the Labour Force Survey (LFS), refusing to acknowledge significant employment drop in 2008-2012 period and remarkable employment growth in 2012-2016 period, recorded by LFS, Prof. Mihail Arandarenko[1] et al. [1], [2] advocate the significance of LFS as the most comprehensive, internationally standardised, household survey aimed at providing information, not only on employment and unemployment, but also on the quality of employment, informal employment, economic and social characteristics of labour force, inactive population, etc. The suspicion of Petrović et al. about the reliability of LFS [14], [15] arises from two different sources. First of all, they do not accept the concept of statistical revision that was applied to LFS in 2014 when a methodological change caused a break of series, and results for 2014 were revised in order to ensure forward comparability with the 2015 and later data obtained after a methodological adjustment had been applied. Backward comparability could not be provided. Petrović et al. hold on to their 'theory' that it is not possible that both employment figures for 2014, originally published and revised, are correct, so they use revised figures for 2014, as they find them "more accurate", and compare them with LFS data for previous years that are not revised and, therefore, not comparable. That way they come up with an enormous growth of employment in 2012-2014. Secondly, they do not understand the difference between LFS-based employment and national-accounts-based employment. Thus, lacking national-accounts-based employment figures in our statistical system (due to the lack of registers and access to existing registers for statistical use), they use LFS-based employment figures (unweighted for actual hours of work and wages) to prove the alleged discrepancy of employment trend and other relevant macroeconomic trends, such as private consumption, social security contribution revenue, etc.

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Although we have already replied to their remarks in [1], [2], [13], which they seem to have ignored since they repeated the same comments in their papers [14], [15], in this paper, we will present some additional findings in support of the arguments provided in our previous papers. Moreover, in search for clues to better understand seemingly counterintuitive dynamics in Serbian labour market, we analyse in more detail the characteristics of our labour market that have been less discussed in public, such as 'non-standard employment' and 'labour underutilisation'. Here, we will introduce our findings about the impact of these trends on the (in)consistency of employment trend and trends in social security contribution revenue and personal consumption.

After the introduction, the remainder of the paper is structured as follows: in Section 2, we will compare LFS employment figures with the corresponding figures from the Central Registry of Compulsory Social Insurance (CRCSI). In Section 3, we will discuss the quality of employment and the manner in which the new, emerging forms of non-standard employment affect it. Section 4 addresses employment elasticity. We provide the arguments against the remarks of Petrović et al. that Serbia is the champion with the highest employment elasticity coefficient. In Section 5, we provide arguments for non-linear relationship of LFS employment with social security contribution revenue and private consumption. In Section 6, we introduce the concept of labour underutilisation.

Section 2: Comparative evidence of administrative and survey employment

In their recent paper, Petrović et al. [15] have stated that "one way or another – strong employment growth in a stagnating economy is an illusion". They came to that conclusion by comparing "the originally released annual employment data until 2013 with the upwardly revised data for 2014" and finding that employment grew by 315,000 in 2012-2014 period. By persistently comparing the incomparable, they demonstrate a lack of understanding of the concept of statistical revision, claiming that it is not possible that both figures for employment in 2014,

originally published and revised, are correct and that "one must be more correct". When the LFS methodology has changed, Statistical Office of the Republic of Serbia (SORS) provided the link between the new and the old methodology by presenting revised figures for one year back (for 2014). The break of series still exists as such and is clearly indicated in official SORS' publications, information notes and in many other papers published recently (e.g. [13]). Since it seems that Petrović et al. [15] still argue about that, in Table 1, we provided a comparative analysis of administrative employment from the Central Registry of Compulsory Social Insurance (CRCSI) and formal employment from LFS, intentionally excluding agricultural activities[2], aiming to demonstrate a strong consistency of data coming from these two completely independent sources.

In order to suggest how the issue of break of series can be resolved, in Table 1, we provide figures for employment growth in 2012-2016 period by summing up the growth in 2012-2014 (using originally released data) and the growth in 2014-2016 (using revised data for 2014 which are comparable with the data for 2016).

The results unanimously suggest formal employment growth of approximately 100,000 in 2012-2016 period (96,000 by CRCSI and 103,000 by LFS) when agricultural activities are excluded. The "rest" of the growth, about 250,000 constituting the majority of growth in the mentioned period, is associated with temporary and seasonal, usually low-paid, informal or partly formalised employment in agricultural activities. Therefore, in 2012-2016, total employment has increased by 13%, while formal employment excluding agriculture and registered employment excluding agriculture went up by 5.5% and 5%, respectively.

These figures are far lower than those produced by Petrović et al. [15] and imply the precarious nature of growing employment, driven by low labour productivity and low wages which, due to high labour taxes and contributions to social security funds, most often remain in informal sector. Such employment growth might not be expected, even in theory, to be proportionally reflected on GDP growth and social security contribution revenue.

Section 3: Quality of employment

Encouraged by the findings listed in the previous section, we further scrutinise the quality of employment. Once again, we rely on LFS as the source, since it offers not only the information about the quantity of employment, but also a mine of information on the quality of employment.

LFS results suggest that recent labour market recovery is followed by a decline in quality of employment due to the expansion of non-standard employment (hereinafter "NSE"). Although there is no common definition of NSE, in this paper, we will use the definition adopted at ILO Meeting of Experts on Non-Standard Forms of Employment in February 2015 [6] which distinguishes four types of NSE: (1) temporary employment; (2) part-time work; (3) temporary agency work and other forms of employment involving multiple parties; and (4) disguised employment relationships and dependent self-employment, of which first three categories might be obtained from LFS.

The emergence of new forms of employment has been a legitimate response of enterprises to volatile market

2 The definition of formal employment in agriculture in CRCSI differs from the one in LFS. LFS considers persons who are registered in the Ministry of Agriculture formally employed. Since law does not stipulate that they have to be registered in CRCSI, they might be missing from the Employment Register.

Table 1: Comparative analysis of employment growth by CRCSI and LFS, in thousands, 2012-2016

	2012	2014	2014 rev.	2016	2012-2014	2014 rev.-2016	2012-2016
	(in thousands)						
Total employment (formal and informal), LFS	2,228.3	2,421.3	2,559.4	2,719.4	192.9	160.0	**352.9**
Formal employment, LFS	1,838.9	1,887.5	2,016.9	2,120.2	48.7	103.3	**152.0**
Formal employment excl. agriculture*, LFS	1,654.9	1,700.3	1,830.4	1,888.0	45.4	57.6	**103.0**
Registered employment excl. agriculture**, CRCSI	1,825.0	1,806.5	1,806.5	1,920.7	-18.5	114.1	**95.7**

Source: LFS, CRCSI

* Agriculture encompasses the following sectors of economic activity: agriculture and part of households as employers related to agricultural activities.

** Here, agriculture encompasses agriculture as a sector of economic activity by NACE rev.2 and individual farmers.

demands, recorded not only in Serbia, but also in many other industrialised and developing countries. The main reasons that affect the change in the quality of employment at a global level are technological progress, growth of the service sector at the expense of agriculture and industry, decline in the unionised share of the work force, etc. Specific reasons for recent non-standard employment expansion in Serbia are various. In public sector, temporary contracts are a way to circumvent the legal decision on the prohibition of employment brought in 2014. Non-standard employment growth in informal sector is the result of unfavourable tax burden for companies hiring low-paid, temporary, part-time or seasonal workers due to a low level of progressivity in the taxation of wages.

The expansion of new forms of employment adversely affects the quality of employment, in terms of job security, wages, access to retirement benefits, holiday and sick pay, on-job trainings. While, from economic perspective, non-traditional, usually unstable, employment has a detrimental effect on innovative work behaviour, consumption and, consequently, economic growth, from social perspective, increasing job insecurity leads to a decline in well-being and reduction of birth rate.

Our intention here is to show that employment growth characterised by stagnation of permanent employment and expansion of temporary, part-time and multiparty employment cannot follow the same pattern of economic growth, private consumption and social contribution revenue as the growth of traditional, stable employment. Especially not in the circumstances of unfavourable demographic trends and emigration of highly educated youth which adversely reflects on the labour market demand for skilled and innovative workforce.

Temporary employment

According to LFS results from 2016, the number of employees[3] with temporary contracts was 441,000, representing almost a quarter of total employment. While the number of employees on permanent contract has been stagnating over the past years, the number of employees on temporary contracts rose by 112,000 in the period from 2014 to 2016, which resulted in the increase in temporary employment rate[4] by 5 percentage points, from 19% in 2014 to 24% in 2016. Moreover, cautiously assuming that change in weighting procedure in LFS[5] does not affect the structure of employees by type of working arrangement and that share of temporary employment in 2010 and 2016 can be compared, it appears that the temporary employment rate has doubled in the last six years (Figure 1).

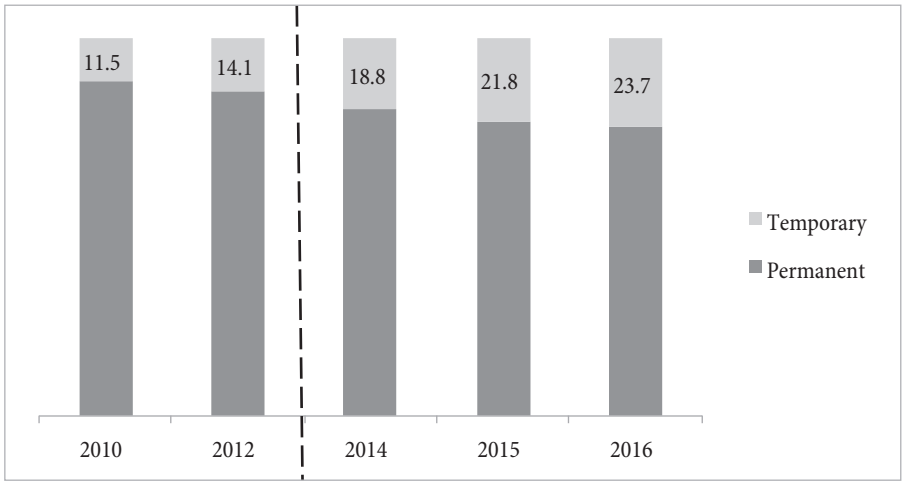
A more detailed analysis shows that temporary jobs are not reserved for a specific group of people. They are

3 The question on type of contract refers to employees, not to self-employed persons and contributing family workers.

4 Temporary employment rate represents the share of employees on temporary contract in the total number of employees.

5 The weighting procedure in LFS was changed in 2014. It caused a break in time series. The previous results for 2014 were revised to ensure forward comparability.

Figure 1: Structure of employees by type of working arrangement, %



Source: LFS, SORS

performed by a wider variety of people (Table 2), most importantly vulnerable categories – the youngest (15-24) and the oldest (65+), people with the lowest level of education, those employed in agriculture, construction and accommodation and food service activities and at households as employers. Temporary employment rates by sex, age groups, education and economic activities for 2014-2016 suggest growth of more than 10 percentage points in some branches of activity (e.g. administrative and support service activities) over that period.

Furthermore, the most volatile part of temporary employment – short-term temporary employment with the duration of work of up to 3 months, suggests even stronger growth. The share of short-term temporary employment in the total number of employees was 9.5% in 2016, compared to 4.6% in 2014.

Table 2: Temporary employment rate, population 15+, 2014-2016

	2014	2015	2016
	(percentage)		
Total	19	22	24
Sex			
Men	20	23	26
Women	17	20	21
Age groups			
15-24	59	61	63
25-34	29	32	35
35-44	15	18	18
45-54	10	13	15
55-64	10	12	14
65+	47	50	46
Economic activities			
Agriculture, forestry and fishing	53	55	53
Mining and quarrying	12	18	16
Manufacturing	17	21	24
Electricity, gas, steam and air conditioning supply	10	14	18
Water supply; sewerage, waste management and remediation activities	13	10	13
Construction	37	44	45
Wholesale and retail trade; repair of motor vehicles and motorcycles	20	24	25
Transportation and storage	13	18	19
Accommodation and food service activities	37	33	38
Information and communication	10	17	18
Financial and insurance activities	14	17	15
Real estate activities	(14)	(22)	(21)
Professional, scientific and technical activities	19	17	20
Administrative and support service activities	26	31	37
Public administration and defence; compulsory social security	13	11	14
Education	15	16	19
Human health and social work activities	8	9	11
Arts, entertainment and recreation	24	30	29
Other service activities	33	34	33
Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use	95	85	70
Activities of extraterritorial organisations and bodies	-	-	-
Education level			
Lower	32	35	35
Middle	19	23	25
Higher	15	16	18

( ) less reliable estimates; - unreliable estimates;
Source: LFS, SORS

Compared to Serbian rate of 24%, the average temporary employment rate for 28 countries of the EU was significantly lower, reaching 14.2% in 2016[6]. However, the indicator that better reflects the negative aspects of temporary employment in Serbia compared to Europe is involuntary temporary employment rate, calculated as the proportion of employees who work on temporary contracts because they could not find a permanent job in the total number of employees. While the average involuntary temporary employment rate in the EU was 8.8%, it reached 21.5% in Serbia in 2016, suggesting that temporary employment in our country is not a personal choice that brings autonomy over the work and a high degree of flexibility as it might be in some other, developed countries of the EU. It is more likely to be a necessity characterised by economic insecurity, lower degree of social protection and poor working conditions.

Part-time employment

Since minimum social security contribution is not adjusted to the hours of work performed, formal work does not pay for part-time jobs, so that mini-jobs and midi-jobs almost always remain in informal sector. According to LFS, the number of employed persons with part-time jobs (less than 36 hours of work in a week) has lately slightly increased and reached 353,000 in 2016.

6 Eurostat

Table 3. Part-time employment, 2016

2016	Total employment	Informal employment	Informal employment rate (%)
Part-time	353,000	252,000	71.4

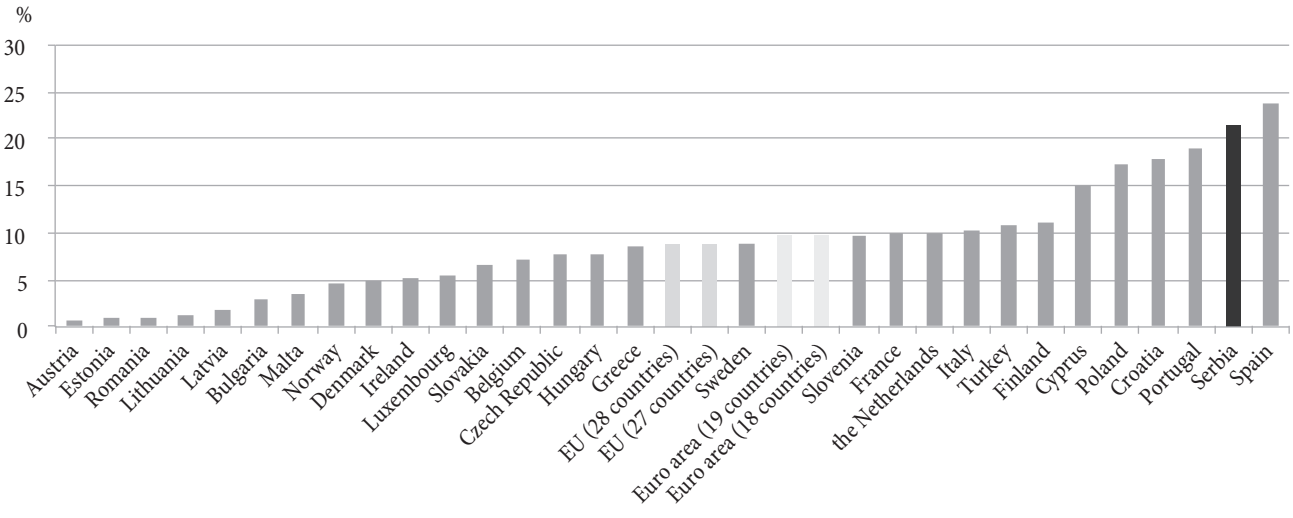
Source: LFS, SORS

However, in just a four-year span, from 2012 to 2016 (if we assume again that the methodological change in LFS in 2014 did not affect the proportion of informally employed part-time workers), informal employment rate among part-time workers rose from 66% in 2012 to 71% in 2016. It means that seven out of ten part-time workers were informally employed, contributing to social security contribution bill with 0 dinars. On the other hand, informal employment rate for those who have regular full-time jobs was about 14% in 2016, meaning that chances of being informally employed are more than five times higher for part-time workers than for their full-time counterparts.

Temporary agency workers

In addition to all mentioned above, LFS results suggest that temporary agency work has emerged as well. Temporary agency work is organised through a triangular relationship between the temporary agency worker, the agency and the user firm. Workers hired by agencies are often in a precarious position, since the duration of their employment is usually less than 12 months, and the quality of their

Figure 2: Involuntary temporary employment rate in EU countries, 2016



Source: Eurostat

jobs and wages is often lower while the work intensity is higher than among the core workforce.

The number of temporary agency workers reached 38,000 in 2016.

Section 4: Employment elasticity and "inconceivable" disconnection between employment and GDP

In the last two decades, employment elasticity has become one of the most common approaches used to assess the labour intensity of economic growth. Employment elasticity is defined as a percentage change in the number of employed persons in an economy compared with a percentage change in the economic output, measured by the gross domestic product. This concept provides insights into what part of GDP change occurs due to a change in productivity and which part is the result of a change in size of total (general) employment. Sustainable growth is growth that secures permanent increase in both employment levels and living standards (productivity), but there is no such thing as ideal employment elasticity ratio. We can only talk about expected long-term values of employment elasticity, which are between 0 and 1. Furthermore, if elasticity is closer to zero, economic growth comes mostly from productivity growth and if it is closer to 1, a major contribution to economic growth is provided by total employment growth.

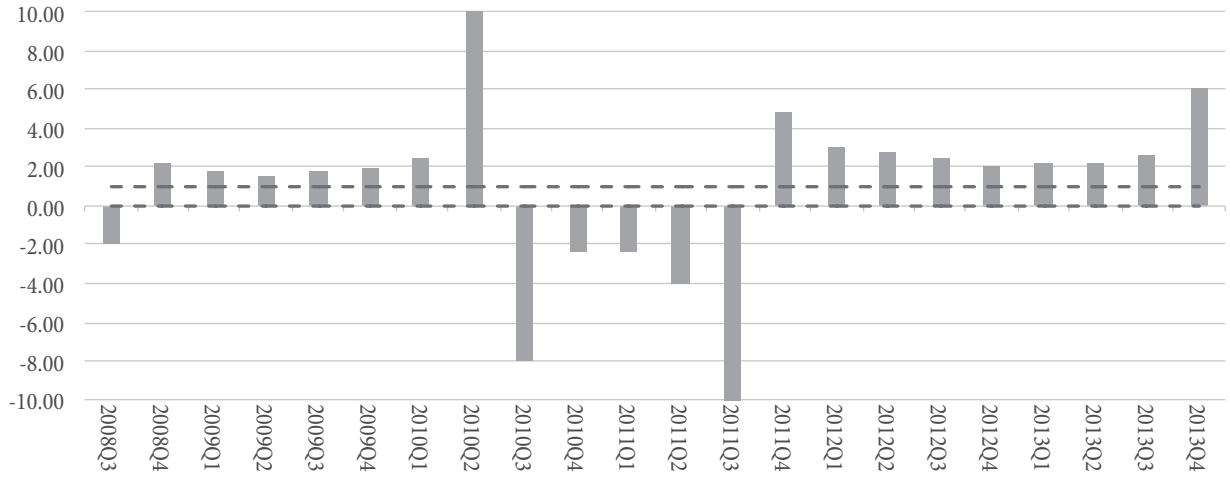
However, there are at least two problems with using this methodology (at least in its rudimentary form)[7]. First, as pointed out by some authors [10], [11], if employment elasticity is calculated for a short period of time, it tends to be very unstable and often outside of the expected 0-1 range. Secondly, some studies suggest [9] and [3] that Okun's coefficients[8], and consequently employment elasticity, are much more unstable during economic recessions than in other phases of the business cycle.

To show how short periods and business cycle can reflect on the values of employment elasticity, we took Spain, which had two recessions – one in early 2009 and another in mid-2012, as an example. We used seasonally and calendar-adjusted data of employment and economic activity and calculated their percentage change compared to the same period previous year. As we can see from Figure 3, in 22 observed periods, employment elasticity was not, for a single period, inside theoretically expected values (0, 1). During that span, the result closest to the theoretically expected value was around 1.5, while the furthest was 25 (bars for second quarter of 2010 and third quarter of 2013 are stacked; their actual values are 25 and -20, respectively).

7 More complex approach is based on using a multivariate log-linear regression model.

8 Regression coefficients used for estimating the sensitivity of output to unemployment - named after Arthur M. Okun, who proposed the relationship between unemployment and GDP in 1962.

Figure 3: Employment elasticity in Spain, 2008Q3 - 2013Q4



Source: Own calculation using Eurostat data, National Accounts [namq_gdp_k], [namq_nace10_e];
Note: Seasonally and calendar-adjusted data, percentage change compared to corresponding period of the previous year.

Without taking into account the aforementioned shortcomings, Petrović et al. in their recent papers [14], [15] applied the simple methodology explained above to examine employment elasticity in Serbia in 2012-2014. In their calculation, employment elasticity was 19.9% at first, and then - after revision - 12.4%. They found that the value was "far outside of the expected and, indeed, any possible range", which led them to the conclusion "that the major discrepancy in employment elasticity in Serbia over the 2012-2014 period, from either the expected theoretical values or actual values in comparable countries, strongly suggests that the reported market trends are highly suspicious". Is the recorded value of employment elasticity indeed outside of any possible range and is that the reason why SORS should stop conducting the Labour Force Survey (LFS) which is used to measure the change in total employment and employment elasticity afterwards? We do not think so.

Firstly, while doing the calculation, they combined the two abovementioned problems which are inherent to this indicator. Besides its calculation for a short period of time, they chose the period in which Serbian economy was in recession. It should be noted that, barring the recession in 2009 (caused by the financial crisis) and recession in 2011 (caused by the European sovereign debt crisis), unlike EU, Serbia had another recession in 2014 (partially caused by floods and partially by structural issues). Consequently, the synergy of both these factors contributed to shifting the values of employment elasticity far over the expected boundaries.

Secondly, and more importantly, even if we disregard the previous fact and attribute it to coincidence, the next example shows the dangerous level of selectivity which is not allowed at this level of scientific debate. As Table 4 shows, Petrović et al. chose an exact time period in which Serbia was "the champion" (as they said) in employment growth and employment elasticity. For this purpose, we divided the whole period of economic crisis (2008-2015) in two-year subperiods and then calculated employment elasticity for 33 European countries (including Serbia). By doing that, we just wanted to show that the choice of exactly 2012-2014 by Petrović et al. was everything but coincidence. Namely, out of all seven examined subperiods, Serbia was an outlier in employment elasticity only in 2012-2014. In all other subperiods Serbia was far from the maximum with regard to recorded employment elasticity.

By carefully analysing the data from Table 4, we can notice exactly what Arandarenko et al. [2] claim: "Extend that period... and some other country would certainly replace Serbia as an outlier". Moreover, Petrović et al. argue "that employment elasticity in Serbia, which is roughly 30 times higher than the average in CEE economies, clearly indicates that something is wrong with the reported employment series in Serbia". Using their erroneous logic, we can say that employment elasticity in Hungary and Romania (which are quite comparable with Serbia) was roughly 84 and 88 times higher than the EU 28 average, respectively. It remains unclear why at least one of these two countries has not ceased to conduct LFS.

Tracking employment elasticity over time could be a useful indicator providing important insights into the extent to which part of the growth is associated with the increase in total employment and to which part is achieved due to productivity growth per worker, but it

Table 4: Highest employment elasticity in Europe by two-year subperiods

	08-10	09-11	10-12	11-13	12-14	14*-16*
EU 28	1.34	-0.35	-0.28	2.10	0.38	0.63
Luxembourg	31.56					
Romania		-29.35				
Hungary			24.61	7.36		
Serbia	6.08	-6.84	-19.99	1.74	12.39	1.76
Cyprus						
Greece						-15.04

Source: Authors' own calculation using Eurostat data on real GDP growth and total employment growth, percentage change in previous year and revised SORS data from LFS for Serbia in 2015 and 2016.
*Revised data

must be interpreted cautiously, taking into account not just the quantity, but the quality of employment as well.

The theory that employment growth depends exclusively on economic growth is long outdated. Nowadays it is clear that the combination of factors, such as the capacity of the labour market and the labour market institutions, in addition to the economic environment, should be taken into account when it comes to employment elasticity.

Section 5: Social security contribution and private consumption and the reasons for their non-linear relationship with LFS employment

Petrović et al. [15] also emphasised the disconnection between social security contribution (SSC) revenues and LFS employment, claiming once again that something was clearly wrong with reported labour market trends and that LFS data were highly suspicious. Such a bold claim does not help us to better understand the trends in the labour market, but it can potentially harm the integrity of internationally standardised and undisputed LFS in public.

Petrović et al. [15] persistently ignore the explanation given by Arandarenko et al. [2] that LFS is not designed to provide a direct link between the employment data and any macroeconomic outcome which is reflected by national accounts. For that purpose, most of the countries use national-accounts-based employment (NA employment). The main reason for that is the fact that without precise weights (mainly wages, but also working hours), satisfying consistency between LFS employment and macroeconomic outcomes, such as personal consumption and social security contribution revenue, cannot be expected.

To clarify the difference between LFS and NA employment, it is worth briefly noting the relevant definitions [5], [16].

In accordance with the International Labour Office (ILO), the LFS defines a person as employed when the person in a given reference week has received compensation in the form of wages, salaries, fees, gratuities, payment by results or payment in kind for a minimum of at least one hour of work, or has been temporarily absent from a job. LFS employment comprises formal and informal employment, whereby formal employment includes persons who have a formal contract on employment, as well as persons who undertake an agricultural activity registered in official government institutions, while informal employment involves work in unregistered enterprises, work in registered enterprises but without a formal contract of employment and without social and retirement security, as well as work of contributing family workers.

The NA uses the European standard for national accounts, ESA2010, and defines persons in employment as persons who supply workforce for the production of goods and services.

NA employment estimates may differ from LFS employment. There are differences due to integration of sources and due to conceptual reasons. While **the choice of sources used to produce NA employment might have a notable impact on the employment figures**, the size of conceptual adjustments is modest.

Differences due to integration:

- National accounts integrate information from many sources. All sources available (including LFS) are assessed and subsequently the decision is made on the best way of integrating them. Each source may shed light on a part of the economy. **Some countries use LFS very modestly in national accounts.** In Denmark, for instance, NA employment is primarily compiled from register-based data. The information is combined to provide the most complete and consistent estimate. As a consequence, each individual basic source may provide results that are different from the integrated NA estimates.

In national accounts, employment figures must be consistent with other variables, such as output and compensation of employees (i.e. wages, salaries and social contributions). Ensuring consistency between variables may result in adjustments.

Conceptual differences:

- Geographical scope: National accounts calculate both domestic (employment in resident production units irrespective of the place of residence of the employed person) and national (resident persons in employment) employment, but more importance is given to the former (e.g. this concept is more appropriate when

examining employment and GDP together). LFS, on the other hand, covers resident households. This means that LFS data must be adjusted, mainly for cross-border workers, to align with the domestic concept normally used in national accounts.

- Coverage differences: LFS does not cover persons living in institutional or collective households (e.g. conscripts), unpaid apprentices and trainees and/or persons on extended parental leave. They are all covered by ESA2010 employment. Appropriate adjustments are therefore needed.
- Recording thresholds: LFS results exclude persons below 15 years of age from the definition of employment (in some countries the exclusion boundaries are below 16 years of age and/or above 75 years of age). National accounts do not exclude individuals from employment because of age. The difference is very small in developed economies.

Bearing in mind the aforementioned, it is clear, before any quantitative analysis, how meaningless it is to expect the correlation between SSC and private consumption trends with LFS-based employment trend. Since data from the most important administrative source, Tax Administration, are not available for statistical use, although there are indications that it will become available soon, SORS still lacks precise figures on NA employment, as well as on total wage bill and actual working hours.

In addition to this, many other factors could have contributed to the non-linear relationship between LFS-based employment and SSC revenue [13], [15]. The most important are:

1. Nature of recent employment growth.
2. Change of pension and disability insurance contribution rate, as well as change of compulsory health insurance contribution rate (both in the middle of 2014).
3. Reduction of salaries for public sector employees (at the end of 2014).
4. Amendment to the Labour Law in 2014 which caused the reduction of salaries.
5. Employers' delay with the payment of mandatory taxes and contributions.

As indicated in Section 3, temporary and part-time jobs have recently expanded. Due to a lack of tax wedge incentives, these types of jobs usually stay in informal sector and, as such, are invisible in SSC total revenues. Just to point out the figures indicated in Section 2 again: total LFS employment went up for cca 350,000 in 2012-2016 period, of which cca 200,000 are in informal sector and cca 50,000 are on the edge of informality (agricultural activities registered in the Ministry of Agriculture which do not have to be registered in CRCSI). Therefore, only cca 100,000 "newly employed" out of 350,000 contribute to SSC revenue and total wage bill.

All of the mentioned facts once again prove that the link between LFS employment and SSC revenues should never be seen as linear, at least not without any insight into LFS microdata.

However, we continue monitoring the SSC trends and our findings, based on the available series of data (we still do not have access to 2016 data), suggest the increase in revenues from payroll tax by 1% (RSD 1.078 million) and from contributions for unemployment insurance by 1.4% (RSD 109.9 million) in 2015 compared to 2014. Here, we ignored the impact of amendments to the Labour Law in the middle of 2014 on salaries and salary reduction in the public sector at the end of 2014. Due to a change in the composition of SSC in 2014, we avoided measuring the increase of revenue in 2014/2015 period. As we do not have access to SSC revenue data for 2016, we are leaving it to Petrović et al. to confirm our hypothesis that SSC revenue growth in 2012-2016 period (taking into account the effects of the amendment to the Labour Law, reduction of salaries in public sector and change in the composition of SSC) was even more moderate than registered employment growth in the same period.

With the aim of measuring the impact of "suspicious" employment growth on private consumption, Petrović et al. [15] made completely irrelevant objections. They obtained "a complete discrepancy between the employment and private consumption trend". Their findings incited us to inspect wages and private consumption trends and to put them in relation with employment growth. Our findings, listed in Table 5, are exactly the opposite of theirs, suggesting a strong correlation between employment

and private consumption growth. Namely, following their logic, we estimate the total wage bill by multiplying average net wage with the registered employment and formal LFS employment figures. Employees on temporary contracts and individual farmers are excluded from the total registered employment figures, since there were no elements to estimate their number, when the revision of the numbers previously used for registered employment, obtained from RAD survey (for the period 2000-2014), was done based on the information from the new source CRCSI. In 2012-2016 period, total wage bill, estimated on the basis of registered employment, went up by 14.7% in nominal terms, while total wage bill estimated on the basis of formal employment figures from LFS went up by 20%. For the estimation of private consumption, we used retail trade turnover instead of HBS survey used by Petrović et al. [15]. Retail trade turnover increased by 14.2% in the same period.

Even though we used both LFS and registered employment figures in this calculation, we find registered employment definition more adequate for this kind of calculation, as it is closest, in terms of weights (hours worked and wages), to the national accounts concept of employment which is supposed to be used in the analysis of the correlation between employment growth and macroeconomic indicators.

Even though private consumption growth, measured by annual retail trade turnover, did not reach 20% as Petrović et al. expected, results do not support their remark on "complete discrepancy between the employment and private consumption trend". Despite the fact that private consumption trend in this case supports the reliability of LFS, we remain firm in the belief that challenging the quality of LFS based on the strength of the relationship of LFS estimates and some macroeconomic indicators is inadmissible. LFS is a priceless instrument for recording informal employment and other atypical types of employment. It provides information on the quality of employment, as well as international comparability. Thus, it should be used primarily for what it was made, instead of requesting from SORS to revise its LFS statistics so as to fit in better with the macroeconomic trends.

Almost perfect correspondence of formal employment from LFS with registered employment, as demonstrated in Section 2, confirms the quality of LFS estimates. Since cca 80% of total LFS employment (formal employment) is benchmarked against CRCSI, it seems that there is no room for scepticism in terms of its accuracy.

However, to demonstrate the complexity of relationships presented in statistics to Petrović et al., we examined other statistics related to private consumption and found that real growth rate of NA-based household final consumption expenditure in 2015 (data for 2016 still not available) was 98.7% compared to 2012. The growth of employment and real growth rate of average salaries to 95% in that period additionally blur the relationship between employment and private consumption trends.

In the next section, we will examine closely the issue of labour underutilisation in our country.

Section 6: Labour underutilisation

The main objective of monitoring labour markets is to assess the extent to which the economy is fully utilising its available human resources, or, in other words, the extent to which it provides opportunities to employ its

Table 5: Employment and private consumption trends, 2012-2016

	2012	2016	Growth, %
Registered employment** (a1)	1,865,614	1,920,679	2.95
Formal employment, LFS (a2)	1,968,000	2,120,000	7.72
Average net wage, RAD, dinars (b)	41,377	46,097	11.41
Estimated total wage bill (a1)*(b)	77,193,510,478	88,537,539,863	**14.70**
Estimated total wage bill (a2)*(b)	81,429,936,000	97,725,640,000	**20.01**
Annual retail trade turnover, mill. dinars	1,196,095	1,366,044	**14.21**

Source: Domestic trade and labour market statistics, SORS

** Registered employment without temporary workers and individual farmers

population to its full potential. With an increasingly diversified and fragmented labour market and varying degree of attachment to it, the unemployment rate is not a sufficient measure of labour underutilisation anymore. Besides the unemployment rate, two additional measures of labour underutilisation have been introduced by ILO: (1) time-related underemployment[9] and (2) potential labour force[10].

Based on LFS results for the population aged 15-64, it appears that number of underutilised people in Serbian labour market was above 1,000,000 in 2016. Even though LFS data suggest a downward trend of labour underutilisation in the last couple of years, the labour underutilisation rate[11] at the level of around 30% for people aged 15-64 in 2016 was still high.

Figure 4, presenting the structure of underutilised labour broken down to three mentioned categories for the population of 15-64 years of age in 2014 and 2016, suggests that employment growth has reflected solely on unemployment, while the scopes of time-related underemployment and potential labour force have not notably changed.

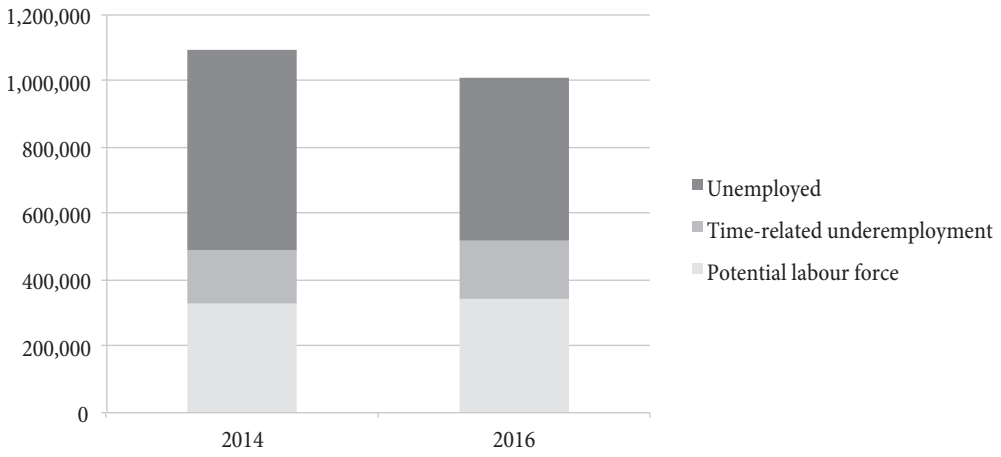
Underutilisation rate among young people aged 15 to 29 was even higher, reaching the level of 40% in 2016. In addition to that, almost one fourth of population aged 15 to 29 is neither in work nor in education or training (NEET), while the employment rate was 33% with notably higher level of informality in this age category (26%) compared to the total population. Furthermore, the survey "School to Work Transition" (SWTS) conducted in 2015 by SORS and ILO for the population 15 to 29 suggests that the school-to-work transition (from the time of graduation to attaining the first job that deems to be either stable or satisfactory) is not sufficient for most youth and that economic and social costs of financial support to youth through a transition period averaging nearly two years are the obstacles to economic growth. Incidentally, it is useful to mention that this survey confirms the soundness of the LFS results since some of its indicators that can be produced in the same way from both LFS and SWTS are almost perfectly consistent. It also confirms the complexity of the link between GDP and employment by warning implicitly that the lack of systematically led transition of young people from school to work leads to human capacity losses and, consequently, to further weakening of the struggling economy.

9 Persons in time-related underemployment are defined as all persons in part-time employment who, during a short reference period, wanted to work additional hours.

10 Potential labour force is made of persons who were neither in employment, nor in unemployment, but who were: (a) unavailable job seekers, that is, carried out activities to seek employment in a recent period but were not currently available to take up employment, or (b) available potential job seekers, that is, did not carry out activities to seek employment in a recent period, but wanted employment and were currently available to take up employment.

11 Labour underutilisation rate is calculated as a proportion of underutilised people in the extended labour force.

Figure 4: Breakdown of labour underutilisation in Serbia, age 15-64



Source: LFS, SORS

Conclusion

Once again, we assess Petrović et al.'s critical arguments against the reliability of LFS data as incorrect and methodologically irrelevant. However, instead of applying their methods of discarding LFS data due to the lack of understanding recent labour market dynamics, we provide additional evidence to support our claims that employment has increased starting from 2012. What we find is that recent employment growth is characterised by stagnation of permanent employment and expansion of temporary, part-time and multiparty employment which cannot follow the same pattern of relationship with economic growth, private consumption and social security contribution revenue as standard employment does. In addition to that, we examine the extent of labour utilisation. The results suggest an insufficient labour demand, on the one hand, and probably (not covered by LFS) an inadequate labour supply, on the other. There is an urgent need to encourage labour demand, to address the substantial work deficit in case of non-standard employment and to strengthen the regulatory framework and active labour market policies for these kinds of employment. There is also a need to better match the educational system to the labour market needs, to promote innovations, to redesign labour taxation system, etc.

We hope that, with this paper, we have achieved our goal: to dispel the suspicion about LFS data reliability and to encourage the academic community to start using valuable resources of LFS in order to target weaknesses of labour market and to support its recovery.

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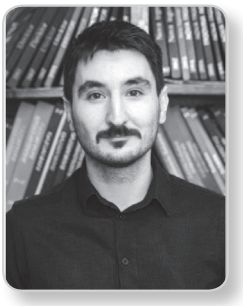

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ORIGINAL SCIENTIFIC PAPER
UDK: 330.142.2
005.52:330.133.3(497.11)
DOI:10.5937/EKOPRE1706355D
Date of Receipt: July 10, 2017

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ANALYSIS OF THE CAPITAL STRUCTURE DECISIONS: A SURVEY OF THE SERBIAN COMPANIES

Analiza odluka o strukturi kapitala na primeru kompanija u Srbiji

Abstract

Our research intends to identify the pecking order theory implementation and both the internal and external factors influencing the companies' debt policy on a sample of 65 companies in Serbia during 2015. The answers were provided by 65 CFOs. The results obtained from the survey indicate that most respondents are inclined to use internal funds, as opposed to external funds. Further analysis of external sources used by the firms in the sample suggests that firms are mostly inclined to use bank loans (59%), leasing (26%), debt securities (8%) and finally equity securities (4%). The results show that the most dominant internal factors influencing the debt policy of the companies in the sample are credit rating of the company and financial slack. And finally, the results indicate that the restrictive and costly credit policy of the banks in Serbia influence the companies' access to external financial means.

Keywords: *pecking order theory, financial decision, internal financing, external financing, restrictive credit policy*

Sažetak

Cilj istraživanja je ispitivanje mogućnosti implementacije teorijskog koncepta 'pecking order theory' kao i analiza internih i eksternih faktora koji utiču na politiku zaduživanja na primeru 65 kompanija u Srbiji tokom 2015. godine. Odgovore na pitanja je dalo 65 finansijskih direktora. Odgovori ukazuju na činjenicu da većina kompanija preferira interne izvore finansiranja u odnosu na eksterne. Ako se dalje analiziraju eksterni izvori, kompanije u Srbiji najčešće koriste bankarske pozajmice (59%), usluge lizinga (26%), dužničke hartije od vrednosti (8%) i na kraju obične akcije (4%). Rezultati su pokazali da najdominantniji interni faktori koji utiču na politiku zaduživanja kompanija jesu kreditni rejting kompanija, kao i višak novca, odnosno gotovine. Takođe, rezultati ukazuju da restriktivna i skupa kreditna politika banaka najviše utiče na pristup kompanija eksternim sredstvima.

Ključne reči: *pecking order teorija, finansijske odluke, interno finansiranje, eksterno finansiranje, restriktivna kreditna politika*

Introduction

In this paper, we shall examine current practices in the capital structure decision-making process on a sample of 65 companies in Serbia. We relied on the pecking order theory to formulate our initial hypotheses. Since bank financing is the primary source of capital in Serbia, our analysis particularly focuses on determinants influencing debt policy of the companies and the obstacles they encounter when obtaining this kind of external capital.

Investments play an important role and are the key factor of economic growth of every country. Within the context of economic turmoil, most countries try to promote a smart, sustainable and inclusive economic growth. Yet, growth cannot be achieved without long-term capital projects involving a large amount of financial resources, which usually cannot be provided from the internal companies' resources. Consequently, a stable financial system with efficient financial markets is a necessary precondition for successful implementation of the companies' investment policies. The financial feasibility of a project has to be determined prior to an actual investment, emphasizing once more the necessity for creating a stable financial environment within which the companies will be able to obtain the capital necessary for both everyday business activities and their investment policy implementation.

In order to gauge the general trend regarding capital structure decisions made by firms in Serbia and to assess its advantages and disadvantages, we will compare our results with those obtained in similar surveys conducted in the United States of America (USA), Canada, Western Europe (WE) and Central and Eastern Europe (CEE). We will try to identify certain similarities and finally, we will try to determine whether factors such as ownership, size of the enterprise and industry influence the choice of capital structure and the frequency and type of obstacles while obtaining external funds.

Consequently, the following hypotheses will be tested:

H0: Companies in Serbia use external financing only when internal resources are insufficient.

H1: Companies in Serbia are inclined primarily to use debt when internal funding is not sufficient. They use equity only when other sources of external financing are not available.

H2: Financial slack and credit rating of the enterprises are the most dominant internal factors influencing the debt policy of the companies in Serbia.

H3: High level of interest rates, a restrictive credit policy imposed by the banks and lack of external funding are the most dominant external-financing obstacles encountered by the companies in Serbia, especially with respect to bank loans.

This paper is structured as follows. Within the first section we present a literature review, along with relevant findings of similar surveys in different countries and regions. Within section two, the methodology is presented, including a detailed description of our questionnaire. The third section introduces the results of our survey and simultaneously compares them with prior research conducted in the USA, Canada, WE and CEE. Finally, we present the conclusions.

Literature review

This paper addresses two major research questions: the implementation of the pecking order theory on the companies in the sample and the most frequent obstacles that companies in Serbia encounter when obtaining external funds (both internal and external obstacles). The pecking order theory implies that the companies prefer internal financing, followed by debt and finally equity. There was a number of surveys that examined these questions. For instance, Graham et al. used a sample consisting of 4,440 companies and 392 CFOs (Chief Financial Officers) that participated in a survey conducted in the USA and Canada [7, p. 188]. The main themes were cost of capital, capital budgeting and capital structure of the companies. The results of the survey implied that: (a) most firms in the sample had a tight target debt ratio and the CFOs relied heavily on practical, informal rules when choosing the capital structure; (b) the most dominant factors influencing the firm's debt policy were financial flexibility and a good credit rating of the company; (c) the respondents were mostly concerned with earnings per share, dilution of ownership and possible recent stock price appreciation; (d) the executives did not worry too much about asset substitution, asymmetric information, transaction costs,

free cash flows or personal taxes when determining the debt policy of the company.

The practical implementation of the pecking order theory was in the focus of various authors, explaining the possibility of implementation of contemporary finance theories in everyday business activities. For instance, Pinegar used the survey consisting of a list of the Fortune 500 firms for 1986. His main conclusion was that CFOs in the sample were more inclined to follow the financing hierarchy than to maintain a target debt-equity ratio. The results showed that companies preferred financial slack, followed by debt and finally equity [11, p. 89].

Using a sample of firms listed in the French Stock Exchange market within the period from 1999 to 2005, Atiyet showed that the capital structure of the companies in the sample relied on the pecking order theory as well [2, p. 9]. The results obtained implied that: (a) internal fund deficit was the most important determinant influencing the decision regarding the issuance of a new debt; (b) the benefits regarding tax shield had a small effect on debt issuing decisions. Generally, the French firms in the sample were more inclined to use internal rather than external financial resources, and these results were mostly explained by the presence of asymmetric information.

Further, while analyzing companies in Europe, Kamoto examined the correlation between the managers' characteristics and their financial decisions. His survey: (a) revealed that optimistic and overconfident managers financed their investments with internal funds to avoid the additional costs of undervaluation imposed by equity financing (resulting from asymmetric information when the company is issuing equity); and (b) showed that managers would rely on internal resources and debt rather than on equity, thus again confirming the pecking order theory [9, p. 123].

Using the IFC database covering 10 developing countries (India, Pakistan, Thailand, Malaysia, Turkey, Zimbabwe, Mexico, Brazil, Jordan and Korea), Booth et al. concluded that: (a) the profitability of the company influenced the level of its debt, indicating that the more profitable a company, the lower its debt ratio; (b) the determinants influencing financial decisions were the same in both developed and developing countries; and (c) the role of the institutional framework was one of the most dominant factors influencing the choice of capital structure [5, p. 128].

Within the survey that covered executives of companies in ten countries in CEE – Bulgaria, Croatia, the Czech Republic, Hungary, Latvia, Lithuania, Poland, Romania, the Slovak Republic and Slovenia, Andor et al. found that the most preferred source of funds was retained earnings (internal source of funds), followed by straight debt, i.e. companies' preferences suggested by the pecking order theory [1, p. 43].

Haas et al. examined in their paper the relationship between the banking system development and the companies' capital structure targets in Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, the Slovak Republic and Slovenia. The results obtained revealed that the development of the financial systems within this region enabled companies to reach higher levels of debt and to bring their actual capital structure closer to their own target structures [8, p. 166].

After analyzing the literature related to the expected hierarchy of financial resources used by the companies and to the main determinants influencing their debt policies, we move to the second part of our literature review that tackles issues regarding the most common obstacles that companies encounter when they use external sources of capital.

For instance, Gonenc conducted a survey using the Thomson Financial Worldscope database within the period from 1991 to 2006. The results showed that the more developed the financial system was, the fewer obstacles the companies encountered when obtaining external capital [6, p. 186]. Osman concluded that the companies operating in countries with a higher asset share of foreign-owned banks reported a higher access to external financing [10, p. 33]. In addition to this, many surveys indicated that the size of the firm played an important role regarding the level (and the type) of the obstacles encountered. Osman, for example, emphasized that large firms in comparison to small and medium-size firms had better access to financing and lower costs of financing [10, p. 34]. The survey was conducted in 28 CEE countries, including Turkey.

Toci also emphasized the correlation between the size of the firm and the financing obstacles [12, p. 58]. The

survey was conducted in transition economies in 1999, 2002 and 2005, and it covered approximately 4,000–9,000 firms. The main conclusion was that small firms were relatively more constrained compared to large companies. (a) Small firms relied more on internal resources in comparison to external ones, and were more likely to be refused when applying for a loan, thus facing greater difficulties in accessing both short- and long-term loans. (b) High interest rates and high collateral requirements posed a greater obstacle to everyday business of small firms in comparison to larger ones. (c) The decrease of financing constraints (over time) was greater for small firms than for larger ones, indicating changes in the credit policy of financial institutions towards the small business sector.

In their survey, Beck et al. used a database for 74 countries, involving large, small and medium firms (10,000 companies). The aim of their survey was to determine effects of the banking market structure on the companies' financing. The results were: (a) a larger share of foreign-owned banks and an efficient credit registry reduced obstacles imposed on companies using external funds, while restrictions on banks' activities, government interference and a greater proportion of state-owned banks increased the effect of financing obstacles. (b) The smallest firms were more affected by all obstacles relative to larger firms. (c) The most dominant obstacles were bank paperwork and bureaucratic matters, inferring that the red tape should be addressed as one of the largest obstacles influencing the companies' everyday activities. (d) High collaterals and excessive documentation needed for leasing activities appeared to be constraining the companies' daily business. (e) Setting up a healthy business environment, along with an efficient regulatory system, needs to be among the top priorities in the developing countries [3, p. 645].

Methodology

Relying on contemporary finance literature, the authors created a questionnaire divided into four sections: questions related to capital-budgeting techniques and cost of capital, questions regarding capital structure issues and the pecking order theory, questions that concern dividend policy and final fourth part refers to enterprise risk management concept ("ERM concept"). This paper focuses on two of the abovementioned areas, more specifically on the second section of the questionnaire: capital structure and the pecking order theory. Additionally, there was an introductory part as well, containing questions regarding industry, ownership, etc. We modeled our questionnaire on the one used in a survey conducted by Graham and Harvey in 2001. This survey was based on a large sample and a broad cross section of firms. The sample consisted of 4,440 firms and 392 CFOs that participated in the survey, with a response rate of 9%. The final version of their survey contained 15 questions and was three pages long.

It is important to emphasize that our paper presents only the results relating to the second part of the questionnaire. Although our questionnaire includes 45 questions, the second section that relates to capital structure and the pecking order theory issues has only 10 questions. The respondents were asked to score the frequency of each factor influencing their capital structure decisions by using a scale of 1 to 5 (1 meaning "never", 5 meaning "always"). Additionally, the respondents were asked whether they used internal or external funds in their everyday business decisions and in their investment financing. They were also required to answer if they encountered financial obstacles when they decided to use external funding. Further, they were instructed to rate the hierarchy of the choice regarding external ways of financing (for instance, debt financing, equity financing, leasing etc.). Moreover, the respondents were asked to rate the frequency of the presence of the obstacles using a scale from 1 to 5 (1 meaning "never", 5 meaning "always"). The draft of the questionnaire was sent to financial analysts and experts for a review before sending it to the respondents, and it was approved by them. The questionnaires were then sent to CFOs by mail. In addition, we offered an option to call the respondents by phone in the event of ambiguities to diminish the possibility of incorrect or biased answers.

Our sample consists of 65 companies (out of 392 that received our enquiry during 2015). The aim was to cover most of the industries in the country and to include as many companies as possible, varying in their size and ownership patterns. Within the sample, the companies range from micro to large companies (micro 34%,

small 20%, medium 20% and large 26% of the sample).[1] Furthermore, the analysis of the ownership shows that 40% of the companies in the sample are foreign-owned firms and 60% are domestic ones. Finally, 25% of firms in our sample are manufacturers. The non-manufacturing firms are equally distributed across other industries: financial (20%), retail and wholesale (20%), hospitality (15%), telecommunications (5%), IT sector (5%) and consulting companies (10%). We analyzed responses according to the companies' characteristics (size, ownership, industry).

Finally, the answers were processed in the SPSS statistical program.

Results

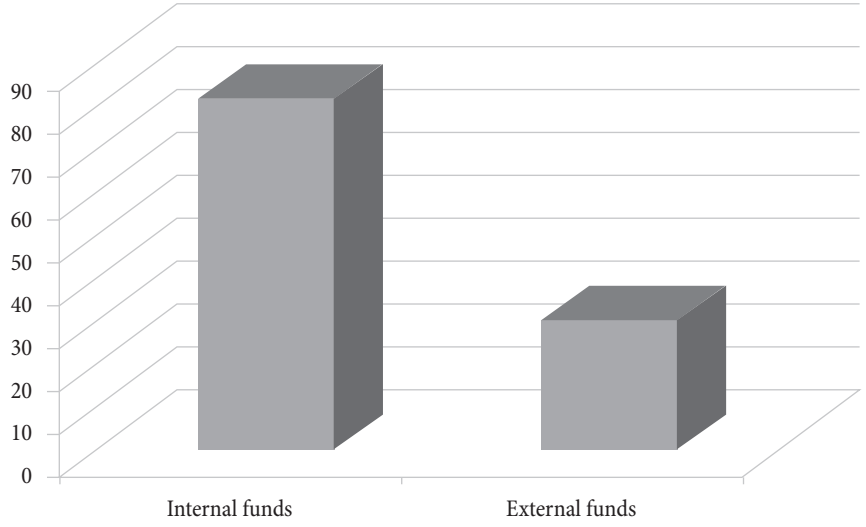
This section is structured as follows. Within the first part we test our H0. Further, within the second part, the H1 is tested. In the third part of this section H2 is tested. And finally, within the last part, H3 is tested.

1 According to the Law on Accounting and Auditing, enterprises are classified in the following categories:
Micro: (annual average number of employees (AANE) ≤10; annual sales (AS) ≤ RSD 84,671,000 and annual average asset value (AAAV) ≤ RSD 42,335,000);
Small: (10 ≤ AANE ≤ RSD 50;84,671,000 ≤ AS ≤ RSD 1,064,433,000; RSD 42,335,000 ≤ AAAV ≤ RSD 532,217, 000);
Medium: (50 ≤ AANE ≤ RSD 250; 1,064,433,000 ≤ AS ≤ RSD 4,233,541,000; RSD 532,217, 000 ≤ AAAV ≤ RSD 2,116,770,000);
Large: (AANE ≥ 250; AS ≥ RSD 4,233,541,000 and AAAV ≥ RSD 2,116,770,000).

The results referring to the choice of financial resources by the companies in the sample are summarized in Figure 1.

As presented, most respondents prefer to use internal relative to external funds. In the questionnaire, we asked the CFOs how often they used both internal and external funds. It is important to stress out that there were two separate questions regarding the frequency of usage of internal and external funding. The results show that 82% of the respondents are more inclined to maintain the financial slack, i.e. the available extra money that a company can use in the case of downturn in everyday business activities. Simultaneously, the results show that 30% of the respondents always and very often use external funding. In respect of the companies' size, the results indicate that small and micro firms are more willing to use their own resources in comparison to external capital. Further, firms within the retail and wholesale sectors, IT companies and companies in the hospitality industry are the most inclined to use internal funds in comparison to external and, also, relative to other sectors in the sample. Our findings confirm that the size of the company influences the capital structure, indicating that small firms are more willing to avoid additional costs imposed by external financing and that they are more likely to be rejected when applying for a loan as opposed to large companies. This is in line with the current restrictive banks' credit policy in Serbia, where the banks are not willing to invest in business proposals

Figure 1: Percentage of respondents (CFOs) who always or often use the given financial resources



Source: Results of the survey conducted by the authors

put forward by small, unfamiliar companies with no track record. Banks are more prepared to extend a loan to large companies that can provide better collaterals and that are too large to fail (indicating the presence of moral hazard). Regarding the ownership, both foreign and domestic companies prefer internal funds to external financing. Key reasons for unwillingness to use external funds provided by the respondents are unfavorable financing conditions offered by the Serbian banks, inefficient capital markets and an inadequate supply of financial products offered by financial institutions in Serbia.

The results coincide with those obtained in surveys conducted by Harvey and Graham in 2001 and Pinegar et al. in 1989 regarding the absence of a specific debt/equity ratio targeted by firms. They also imply the existence of a hierarchy among the Serbian firms implied by the pecking order model of financing. Consequently, when the results from these surveys are compared, it is evident that the general situation regarding the preference of the companies towards internal financing in comparison to external has not changed over this long period of time.

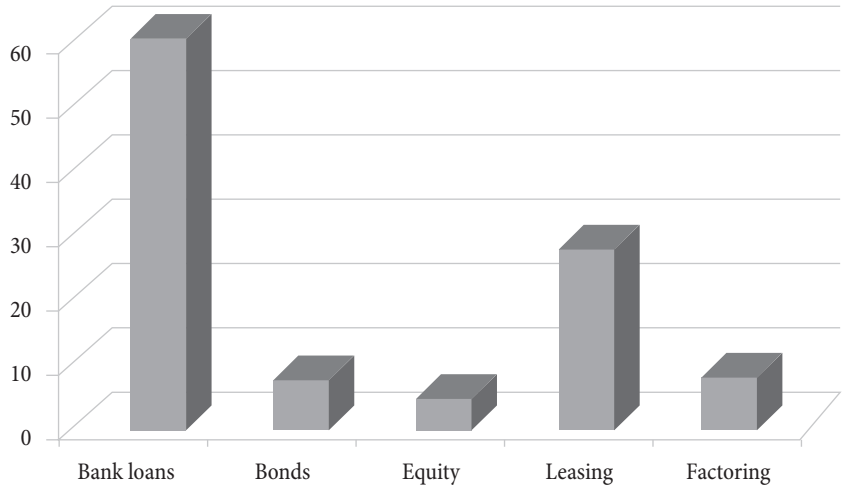
Furthermore, our results are in correlation with findings of Beck et al. [3] and Osman [10], stating that small and medium firms are more inclined to use internal resources in comparison to larger companies.

The presented results from our survey confirm H0 of the paper suggesting that the companies in Serbia use external financing only when internal resources are insufficient.

The results referring to the choice of external financial resources by the companies within the sample are summarized in Figure 2.

These results show that the analyzed firms are primarily inclined to use bank loans (59%). The second most dominant source of the external financing is leasing (26% of companies in our sample use this type of external funding), then issuing debt securities (8%) and finally issuing equity securities (4%). The Serbian financial system is bank-oriented because the Serbian capital market is inefficient and shallow. Consequently, the companies are more willing to take out bank loans in comparison to issuing, for instance, corporate bonds or equity securities. However, the scarce usage of the financial instruments other than bank loans may additionally be the result of general distrust towards new financial instruments and the lack of knowledge. The same trend is observed regardless of the company's size. All types of companies prefer bank loans, followed by leasing, corporate bonds and, finally, equity. Further, the firms in pharmaceutical, agricultural, retail and wholesale sectors provided the highest response rate regarding the frequency of using bank loans (90%, 99% and 70% respectively). Finally, both foreign and domestic companies predominantly use bank loans. This finding indicates that even companies that are an integral part of multinational businesses find the Serbian market of external financing inefficient, with an inadequate offer of financial instruments. This in turn forces even them to be primarily focused on bank loans as opposed to

Figure 2: Percentage of respondents (CFOs) who always or often use a certain kind of external financial resources



Source: Results of the survey conducted by the authors

other types of external financing. Furthermore, they are more willing to use credit lines provided by their parent company, since these bear more favorable conditions in comparison to the loans offered by the Serbian banks.

Our results coincide with those acquired in surveys conducted by Graham et al. [7], Atiyet [2] and Haas et al. [8].

With the presented results and after the analysis, we have confirmed our H1, implying that companies in Serbia are inclined to use debt when internal funding is not sufficient and that they use equity only when other sources of external financing are not available (i.e. are exhausted).

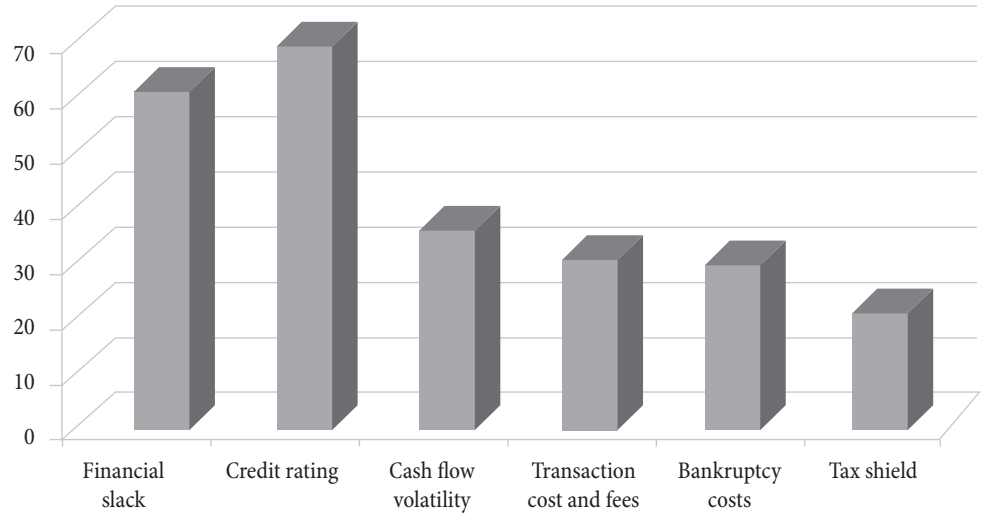
As it is clearly exhibited in Figure 3, the most dominant internal factors influencing the debt policy of the companies in the sample are the credit rating of the company and financial slack. Within the economic turmoil, the company's sensitivity to the cost of capital appeared to be the most important component influencing its final financial decisions. Credit rating, mostly gained from banks, appears to be the dominant factor influencing the debt policy of the firms. Consequently, the lower credit rating unavoidably leads to higher interest rates, i.e. higher cost of capital, given the fact that banks want a higher return due to the lower credit rating of the borrower. Finally, the term 'financial slack' refers to the habit of the companies to restrict debt in order to have internal resources available for new business opportunities (61% of the CFOs indicated that this is the most frequent factor influencing the debt policy of their respective firm). The latter coincides with the previous conclusion that companies prefer internal funds to external, and this preference deeply influences the company's debt policy. The same trend is observed regardless of the company's size. All types of the analyzed companies marked these factors as the main determinants influencing their debt policy. However, costs of financial distress turned out to be the key factor influencing debt policy of micro firms. These results correlate with those obtained in the survey conducted by Beck et al. [4]. Further, the companies in agricultural, trade and hospitality industry marked both the financial slack and their credit rating as the most dominant factors influencing their debt policy. Finally, both foreign and domestic companies perceive the latter as the most dominant internal factors, indicating the general trend of the companies in Serbia.

The presented analysis confirmed H2 of the paper – specifically, financial slack and credit rating are the most dominant internal factors influencing the debt policy of the companies in Serbia.

The respondents were required to answer whether the firms encountered the obstacles when trying to obtain external financing. The results are presented in Figure 4.

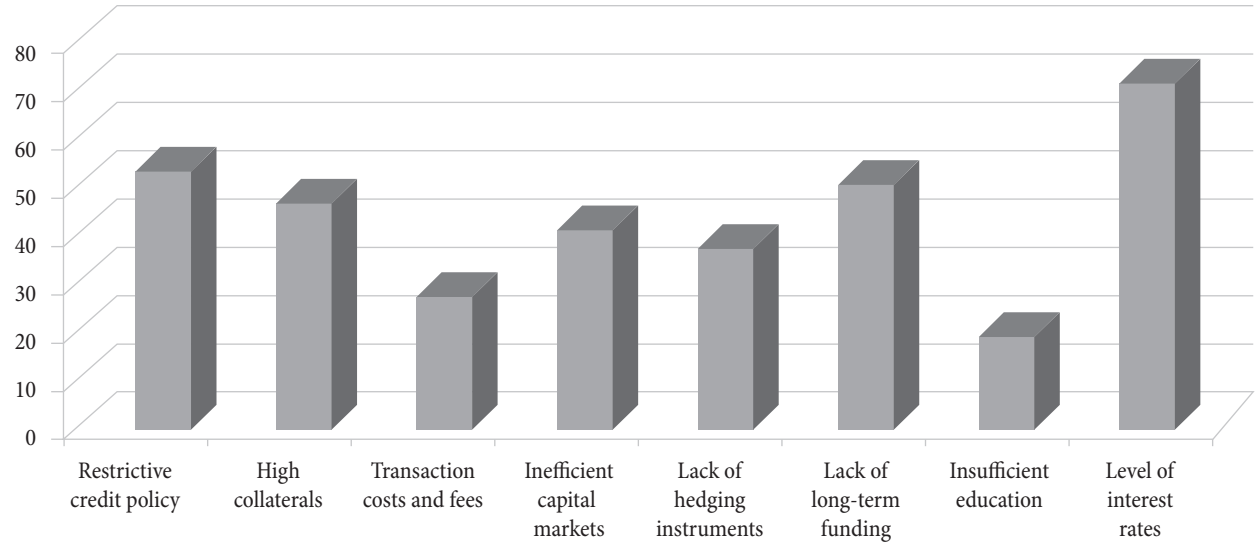
The results show that the firms most frequently encounter the following obstacles when obtaining the external funds: level of interest rates (70%), restrictive credit policies (53%), lack of long-term funding (50%) and high collateral requirements (47%). The restrictive banking

Figure 3: Analysis of debt policy factors



Source: Results of the survey conducted by the authors

Figure 4: Percentage of respondents (CFOs) who always or often encountered the following obstacles when acquiring external funds



Source: Results of the survey conducted by the authors

policy and the red tape may produce obstacles for the firm in its everyday business. The restrictive banking policy involves per se high collaterals as a way of securing the bank's investments. However, this can be very discouraging for the already exhausted Serbian companies, especially for the small firms that may well be solvent and with profitable projects, and yet with insufficient assets to invest in lucrative ideas or to provide the acceptable collateral. The banking sector's credit policy is very restrictive in respect of increasing the volume of loans. Consequently, this restrictive policy inevitably influences the companies' access to external financial means. The more restrictive banks' credit policy is, the fewer funds are available for already insolvent companies in Serbia. The lack of long-term funding may appear as problem in the future, because it influences capital budgeting policy of each firm and the financing of long-term projects essential for growth at the macro level, especially in the conditions of economic turmoil and general insecurity. The same trend is easily noticeable when analyzing the companies in terms of their size. All types of companies marked these factors as the main determinants influencing their debt policy. However, when it comes to the size of the firms in the sample, small and medium firms indicated these obstacles as the most jeopardizing ones. The latter coincides with the results obtained by Beck et al. [4], i.e. our results simultaneously show that smaller firms are more sensitive to the financial obstacles than the larger ones. Finally, both foreign and domestic companies emphasize these issues to be the greatest obstacles when acquiring external capital, indicating that business environment improvement should be one of the top priorities in the following period.

Thus, H3 of the paper has been confirmed, stating that high level of interest rates, a restrictive credit policy imposed by the banks and the lack of external funding are the most dominant external financing obstacles encountered by the companies in Serbia, especially with respect to bank loans.

Conclusion

Our research aimed at identifying the pecking order theory implementation and both the internal and external factors influencing the companies' debt policy on a sample of 65 companies in Serbia. The authors confirmed four hypotheses.

- H0 states that companies in Serbia use external financing only when internal resources are insufficient.
- H1 states that companies in Serbia are inclined to use debt when internal funding is not sufficient and that they use equity only when other sources of external financing are not available.
- H2 emphasizes that the company's financial slack and credit rating are the most dominant internal factors influencing the debt policy of the companies in Serbia.

- H3 refers to a restrictive credit policy of Serbian banks, a lack of adequate external funding and high interest rates as the most dominant external financing obstacles encountered by companies in Serbia, especially with respect to bank loans.

The general conclusion is that the Serbian market of external financing is inefficient, with an inadequate offer of financial instruments. The companies, when internal funding is lacking, are mostly inclined to use bank loans. Bearing in mind that the Serbian financial system is bank-oriented, the results are not so surprising. Finally, internal factors such as financial slack and credit rating of the companies influence the debt policy. The better the credit rating is, the more favorable conditions regarding cost of capital are. Restrictive credit policy, high level of interest rates and high collaterals pose the greatest obstacles regarding external financing. However, the already mentioned obstacles mostly refer to bank loans. The latter implies the necessity for creating a favorable business environment for implementing alternative ways of acquiring capital (venture capital markets, business angels etc.). Creating a diversified financial environment with equal opportunities for all types of the companies, especially for small and medium enterprises, may be essential for the development of the country both on macro and micro levels.

This Research Paper was part of the project Advancing Serbia's Competitiveness in the Process of EU Accession, No. 47028, in the 2011-2017 period, financed by the Serbian Ministry of Science and Technological Development.

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REVIEW PAPER
UDK:005.334:336.71
006.44:336.77
DOI:10.5937/EKOPRE1706365L
Date of Receipt: June 13, 2017

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THE TREATMENT OF CREDIT RISK IN POST-CRISIS REFORM OF BASEL RULES: MODIFICATION OF THE STANDARDISED AND FOUNDATION IRB APPROACH

Tretman kreditnog rizika u post-kriznoj reformi Bazelskih pravila – modifikacija standardizovanog i osnovnog IRB pristupa

Abstract

The framework for credit risk from Basel II standard failed to provide an adequate response in periods of crises, so the necessity of its revision is an imperative placed before the Basel Committee. A comprehensive reform of approaches used to determine risk-weighted assets is particularly focused on the rules relating to credit risk, because it is its largest constituent. The directions of evolution of approaches for credit risk can be anticipated in consultative documents of the Basel Committee, and this paper is primarily aimed at presenting a critical review of their upcoming changes, particularly focusing on Standardised approach (SA) and Foundation IRB approach (F-IRB). In that sense, key points of revision are emphasised, and comparative analysis regarding current regulations has been done. As additional benefits of research, certain suggestions are presented with a view to upgrading the architecture in an analytical sense, especially in the part relating to F-IRB approach, where correlation issues, application of models and their validation have been identified. One of interesting solutions proposed for improving the credit risk system would be the third hybrid approach, which implies the development of models by the national regulators and implementation in their jurisdictions. The dominant conclusion of the entire evaluation is the need for radical modification of the credit risk framework, because the empirical analyses have demonstrated major deficiencies and anomalies in calculating risk-weighted assets. Therefore, the proposals referred to in the Basel Committee consultative documents cannot be seen as a step in the right direction, because there is an obvious lack of power for radical changes of the approaches which are used to describe the positions of the exposure to credit risk.

Keywords: *credit risk, Basel standards, Basel rules reform, standardised approach (SA), F-IRB approach, CRA ratings, probability of default (PD), risk-weighted asset (RWA)*

Sažetak

Okvir za kreditne rizike Bazel II standarda nije uspeo na adekvatan način da pruži odgovor u uslovima krize zbog čega je neminovnost njegove revizije imperativ koji se postavlja pred Bazelski komitet. Sveobuhvatna reforma pristupa koji determinišu rizikom-ponderisanu aktivu u svom fokusu imaju upravo pravila vezana za kreditni rizik, jer je on njen najveći konstituent. Pravci evolucije pristupa za kreditni rizik naziru se iz konsultativnih dokumenata Bazelskog komiteta, i ovaj rad ima prvenstveno za cilj kritički osvrt na njihove nastupajuće promene sa primarnim aspektima na standardizovani pristup (SA) i osnovni IRB pristup (F-IRB). U tom smislu, apostrofirane su ključne tačke revizije i urađena je komparativna analiza u odnosu na trenutno aktuelnu regulativu. Kao dodatni benefiti istraživanja predstavljeni su predlozi koji treba da analitički nadograde aparaturu, posebno u delu F-IRB pristupa, gde su identifikovana pitanja korelacije, primene modela i njihove validacije. Jedno od zanimljivih rešenja koje se predlaže za unapređenje sistema kreditnih rizika bi predstavljao treći, hibridni pristup, koji bi podrazumevao konstrukciju modela od strane nacionalnih regulatora i primenu u njihovim jurisdikcijama. Dominantni zaključak celokupne evaluacije je potreba za radikalnim promenama okvira za kreditne rizike, jer su empirijske analize dokazale velike manjkavosti i anomalije obračuna rizikom-ponderisane aktive. Zbog toga se predlozi u konsultativnim dokumentima Bazelskog komiteta ne mogu smatrati korakom u pravom smeru jer je očigledna nedovoljna snaga za korenitim promenama pristupa koji se koriste za opisivanje pozicija izloženosti kreditnom riziku.

Ključne reči: *kreditni rizik, Bazelski standardi, reforma Bazelskih pravila, standardizovani pristup (SA), F-IRB pristup, CRA rejtinzi, verovatnoća default-a (PD), rizikom-ponderisana aktiva (RWA)*

Introduction

A comprehensive reform of regulatory rules relating to banking supervision, the standardisation of which is embodied in the Basel Accords, emerged as one of the necessary procedures in banking industry. Some evident mistakes integrated within their structures were directly revealed upon the outbreak of the last financial crisis in the course of 2007. The reactions were directed against the segments with the major discrepancies identified, and these were reflected in the revision of rules for market risks[1] [3], and in an entirely new accord, Basel III [4], [5], primarily addressing capital and liquidity.

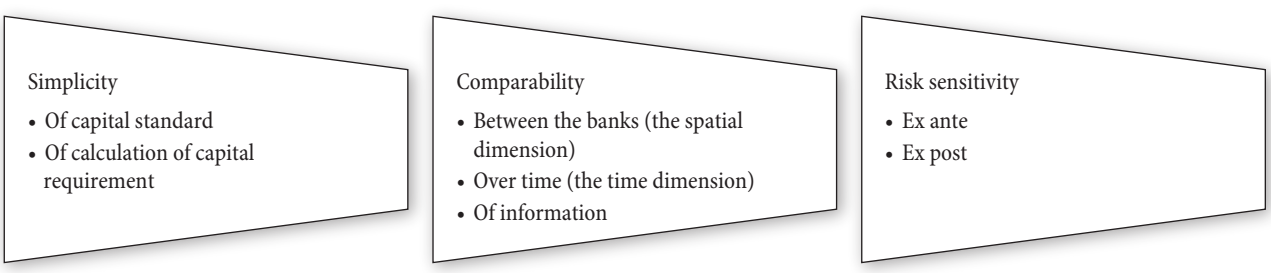
Following these reforms which served as a quick response to the problems, a question arose relating to the overall system and thorough revision of the approach for describing the risk positions, that is, the approach based on which risk-weighted assets (RWA) is determined. In other words, the focus is now on the denominator of the capital adequacy, as a single indicator of the financial position of a bank. The new reform, therefore, encountered three ultimate objectives that the new set of rules was to meet [6]:

The above principles constitute the basis which requires finding an adequate balance, as it is evident that the principles are in mutual collision. In theory, higher sensitivity to risk can only be achieved by increasing the complexity of the framework, which has an adverse effect on the remaining two principles, and vice versa. This is why it is necessary to perform their optimum trade-off in order to achieve the maximum effects of supervision.

A particular role in the process of developing new Basel rules lies with the modifications relating to credit risks, as the most important type of risks encountered by the banks in their operations, and whose participation in RWA is by far the highest. This has been presented, therefore, as one of the goals of the remaining reforms, as highlighted in the report of the Basel Committee for Banking Supervision (the Basel Committee) for G20 [9]. This paper investigates the proposed changes of the Standardised approach (SA) and Foundation Internal Ratings-Based approach (F-IRB) for credit risk, in a form of a critical overview of potential directions of their evolution. In this respect, one radical move is particularly interesting and was proposed during the initial revision of the SA, and refers to the complete removal of credit ratings provided by external rating agencies (CRA) in the process of determining the risk weights. This can be interpreted as a response to increasing criticism of CRA ratings and their contribution to deepening the negative effects during periods of stress. It was proven that credit ratings are unable to predict the defaults in a proper manner and that they are inferior to the relatively straightforward scoring models which can be developed on the basis of publicly available information [16]. On the other hand, it was evident that certain manipulations had occurred, with respect to reallocation of portfolio in the classes which had been, in the eyes of regulators, perceived as less risky, and which were accordingly treated with lower risk weights. This is also reflected in the implementation of internal model approach, as the banks made use of the opportunities provided to reduce RWA [21]. It is evident that the issue of moral hazard in IRB approach further emerged in the situations when the banks were provided

1 After a long and exhaustive consultation period, in January 2016, the Basel Committee adopted an entirely new set of rules for market risks.

Figure 1: Principles of revision of regulatory rules



Source: Basel Committee

the opportunity to choose between the approaches for the calculation of RWA [14], which is not the case when the approach is mandatory for all. These are just some of the issues that need to be brought out in the process of revision of the overall framework, in order to analyse its further direction.

The focus of the research is solely on the calculation of RWA, while some other segments have not been addressed, primarily concerned with the credit risk mitigation techniques and the issues relating to off-balance sheet exposures (the credit conversion factors). The second part of the paper addresses the topics relating to the reform of the SA approach. The third part presents the future of F-IRB and the changes indicated in the Basel Committee consultative documents. The introduction of the so-called capital floor will establish the relation between these two approaches, which is also one of the topics in the third section. The fourth part is a substantive part of the paper which offers a critical perception of the proposed changes of Basel rules and provides a comparative analysis of the current regulations with the proposed guidelines for their modification referred to in previous sections. The conclusion is the final, fifth part and it summarises all the results based on the previous analyses and research.

The new rules of standardised approach for credit risk

According to the announced modifications in the consultative documents of the Basel Committee, the main architecture of the SA is to remain unchanged. The rationale will retain the principles of the so-called Cooke ratios [17], laid down during the introduction of Basel I, which implies the use of risk weights for exposures. The foundations laid down at the time are, so far, unsurpassed and the perception that the use of different risk weights for different exposures, depending on their generic characteristics, results in risk sensitivity still remains in effect. In other words, the main changes which are subject to modifications relate exactly to these risk weights and the methods of their determination, whereas the mechanism of their use is unchanged.

The initial proposal for SA revision

The Basel Committee presented its initial proposals for the revision of the SA approach in its 2014 consultative document [8]. The first major change, which was anticipated at the time, was the complete removal of the CRA ratings, which would constitute a significant modification of the existing approach, in line with Basel II. Exactly at that time, during the implementation of Basel II, the introduction of CRA ratings was highlighted as one of its most important modifications, as it enables the fine grading of risk weights based on credit quality of an entity/transaction, which tended to be one of the key deficiencies of Basel I. The decision for the removal of CRA ratings was underpinned by the relevant principles of the Financial Stability Board, desiring to reduce their impact and role in a financial system. They were labelled as one of the main causes of the so-called "cliff effects" and "herding behaviour", therefore multiplying the adverse effects during the financial crisis [13]. The decision was thus reached that CRA ratings should be entirely removed for banks and corporates exposure classes. Exposure classes based on the credit ratings of a country (sovereigns) are not included in the scope of the current discussion, as the Basel Committee is preparing for them a broader scope of reforms.

The consultative document presented a proposal of new parameters to be used for determining the risk weights. These were designated as risk drivers and identified in

Table 1: Risk drivers for exposures to banks and corporates

Exposure class	Risk drivers	Calculation method	Discriminant direction	
			Defaulters	Non-defaulters
Banks	CET 1 ratio		⬇	⬆
	Net NPA ratio		⬆	⬇
Corporates	Leverage		⬆	⬇
	Revenue	Income from business activities	⬇	⬆

Source: Basel Committee and author's illustrations

accordance with the above general principles of regulatory reform for banking supervision (simplicity, comparability and risk sensitivity).

It is important to point that the determination of risk drivers was done after conducting the procedure rather similar to the development of internal rating system in banks. Statistical analyses were performed based on the empirical data, along with the complementary expert support, after which the risk drivers referred to in Table 1 proved to be the parameters with the strongest power of prediction for defaults. Their discriminant directions define the features which distinguish between "good" and "bad" entities. In the course of the procedure, the calibration of the risk weights was performed by integrating the calculated probability of default for each of the critical values into the formula used for the calculation of IRB approach. The new weights are presented in Tables 2 and 3.

The proposed risk weights follow the discriminant direction of the risk driver, thereby distinguishing between "good" and "bad" clients. There are extreme cases which, in effect, may serve as unique knock-out criteria, and they automatically result in the use of a maximum risk weight value of even 300%, as in these examples, the probability of default is assessed as very high. The proposed maximum risk weight value is doubled compared to the current regulations, in line with Basel II. In cases of exposures to banks, this may arise when the capital adequacy indicator, in the form of CET1 ratio, is below the minimum set forth by Basel III standard, which suggests very poor financial image and the situation of undercapitalisation of a bank. On the other hand, in exposures to corporates, the solvency requirement is the most relevant one, because in case the accumulated losses have exceeded the total capital of an entity, the entity's liabilities in such case exceed its assets, and consequently, the entity is in the insolvency zone. An important change in exposures to corporates is that now it explicitly includes the cases of specialised lending, which has been taken over from the IRB approach in Basel II, with minor modifications.

The class of exposure to retail was not subject to major changes, except for the additional clarification relating to cases when the exposure generically belongs to this class, but for the reasons of the imposed exposure limits, the class may not be eligible for the preferential risk weight of 75% for retail. In such a case, the exposure is categorised as the so-called other retail exposures[2]. The most significant changes are also seen in the class of exposures secured by real estate. The class is still divided into the exposure secured by the residential real estate and the one where the collateral is the commercial real estate, due to its different treatment.

Considering that the point is about the exposures secured by real estate and that the collateral in these cases has much more important role than in other exposure classes,

2 Exposures to SMEs which fail to meet the criteria for the so-called retail segment are treated as exposures to corporates.

Table 2: Risk weights for exposures to banks

	CET1 ratio ≥12%	12% > CET1 ratio ≥ 9.5%	9,5% > CET1 ratio ≥ 7%	7% > CET1 ratio ≥ 5.5%	5.5% > CET1 ratio ≥ 4.5%	CET1 ratio < 4.5%
Net NPA ratio ≤ 1%	30%	40%	60%	80%	100%	
1% < Net NPA ratio ≤ 3%	45%	60%	80%	100%	120%	300%
3% < Net NPA ratio	60%	80%	100%	120%	140%	

Source: Basel Committee [8, p. 31]

Table 3: Risk weights for exposures to corporates

	Realisation≤€5m	€5m ≤Realisation ≤€50m	€50m ≤Realisation ≤€1bn	Realisation ≥€1bn
Leverage: 1x-3x	100%	90%	80%	60%
Leverage: 3x-5x	110%	100%	90%	70%
Leverage> 5x	130%	120%	110%	90%
Negative capital	300%			

Source: Basel Committee [8, p. 33]

the main risk driver is LTV ratio, regardless of whether the residential or commercial property is in question. What occurs here, in effect, is the substitution between the client's risk weight and the property risk weight, and additionally, in cases of residential property the client's financial position is also considered through DSC ratio. An exception may be the Option A with commercial real estate which foresees the treatment of exposure as if unsecured and weighting is done based on the client's generic type (corporate or retail). Such position is underpinned by the fact that commercial real estate was one of the reasons for intensifying the crisis, for the reasons of its high level of volatility, followed by a sharp decline in value and reduced marketability in periods of stress. Only in developed and deep markets there is room to recognise the preferential treatment, in terms of risk weight of 50%, provided that the generated LTV ratio does not exceed 60%.[3]

LTV ratio and risk weights are in positive correlation, as the higher value of LTV implies lower margins of safety, due to the fact that the value of property increasingly amounts to the value of the exposure. In order to categorise an exposure within this class with the risk weights referred to in Table 5, such exposure would need to meet a taxonomy of requirements, with respect to finished property, legal enforceability and prudent (adequate) valuation.

Another interesting development in the consultative document is the introduction of the so-called add-on (additional) factor for currency mismatch, in a sense that a client earns his/her income in one currency, and has the liabilities in a form of a loan, in some other currency. This implies adding an additional percentage for such a mismatch to the risk weight, for the classes of exposures to retail and exposures secured by residential real estate.

Second consultative proposal for revision to the SA for credit risk

Following the initial proposal for revision to the SA for credit risk, in late 2015 the Basel Committee published its second consultative document [10], incorporating the responses of all interested stakeholders, primarily the representatives from the banking industry, to the proposed changes from the first consultative document. The document again reintroduces the use of CRA ratings, yet insists on their non-mechanistic use, which implies the mandatory internal credit risk management procedure. This is primarily reflected in the mandatory establishment of due diligence system and performance of internal

3 The preferential treatment requires the fulfilment of other requirements listed in the document [8, p. 37].

Table 4: Risk drivers for exposures secured by real estate

Exposure class	Risk drivers	Calculation method	Discriminant direction	
			Defaulters	Non-defaulters
Secured by residential real estate	LTV ratio		⬆	⬇
	DSC ratio		⬆	⬇
		Option A: treating as unsecured		
Secured by commercial real estate		-		
		-		
	Option B: LTV ratio	Same as with the residential real estate	⬆	⬇

Source: Basel Committee and author's illustrations

Table 5: Risk weights for exposures secured by real estate

Residential real estate	LTV ≤ 40%	40% ≤ LTV < 60%	60% ≤ LTV < 80%	80% ≤ LTV < 90%	90% ≤ LTV < 100%	LTV ≥ 100%
DSC ≤ 35%	25%	30%	40%	50%	60%	80%
Other loans	30%	40%	50%	70%	80%	100%
Commercial real estate	LTV < 60%		60% ≤ LTV < 75%		LTV ≥ 75%	
	75%		100%		120%	

Source: Basel Committee [8, pp. 36, 38]

risk assessment. The imparity principle is established as due diligence may result only in higher risk weight if overreliance on CRA ratings is identified. In other words, the flexibility exists only "in upward direction" when the level of risk weight is in question.

A new development is that each supervisor now needs to identify explicitly whether his jurisdiction allows the use of CRA ratings or not. Accordingly, in cases of exposures to banks, the two following approaches are offered:

1) External Credit Risk Assessment (ECRA) – the approach based on CRA ratings and incorporated in jurisdictions that allowed their use
2) Standardised Credit Risk Assessment (SCRA) – used in exposures with no CRA ratings in jurisdictions which allow their use; all exposures in jurisdictions which do not allow the use of CRA ratings

ECRA is grounded upon the current rules for the SA, in line with Basel II. The external credit rating is used to determine the so-called "base" risk weight which may be one level higher if it is identified during the internal risk assessment that the external credit ratings failed to reflect the actual risk level (due diligence). Short-term exposures with an original maturity of three months or less again have the preferential treatment.

SCRA approach has somewhat taken over the concept of the initial revision which introduced the risk drivers. They are very broadly established here and primarily refer to the compliance with regulatory requirements. The key arrangement relates to the evaluation of generating of cash flow for the settlement of liabilities and their dependence on macroeconomic elements, however, the explicit classification is done based on the following features:

In accordance with the grading from Table 6, the following risk weights were identified:

An important change for SCRA approach is that the Basel Committee is announcing the integration of macroeconomic risks through OECD country rating. This proposal is still in the early development stage and the integration method has not been defined yet. ECRA approach implies that within CRA rating, there is a perception of macroeconomic risks.

CRA ratings have also been reintroduced for exposures to corporates and their use is defined by the regulators. However, unlike exposures to banks, a single risk driver has not been designated here, in order to determine the risk weight in cases when external credit ratings are not applied. This implies that the risk weight remains the same as in the current regulations of the SA, that is, 100%. The only change is that for some exposures which could be considered as the "investment grade", 75% weight is assigned.[4] These exposures are seen as the entities which have the adequate capacity to meet their financial commitments in a timely manner, irrespective of the economic cycle and macroeconomic conditions, however, they must have the securities outstanding on a recognised securities exchange. In the systems where CRA ratings are applied, there are principally no changes with respect to Basel II, with the fact that the "base" risk is determined using the same grading method. Such base risk may be changed, but solely towards a higher risk weight, on the basis of due diligence performed.

4 SMEs which meet the eligibility criteria for the corporate segment are assigned the weight of 85%, not 100%.

Table 6: Classification of exposures to banks - SCRA

Group / grade	Compliance with regulatory requirements	Compliance with capital buffers	Auditor's opinion on financial statements
A	✓	✓	Unqualified
B	✓	×	Unqualified
C	×	×	Disclaimer or qualified

Source: Basel Committee and author's illustrations

Table 7: Risk weights for SCRA approach

Risk assessment	Grade A	Grade B	Grade C
"Base" risk weight	50%	100%	150%
Risk weight for short-term exposures	20%	50%	150%

Source: Basel Committee [10, p. 29]

In retail exposures, there have been no changes in relation to the first consultative document, and the "other retail exposures" is still in use. The class of exposures secured by real estate again underwent some more significant changes. The rationale remained whereby the key risk driver is LTV ratio, whereas in the residential real estate class, DSC ratio has clearly been excluded. Some classes of specialised lending from corporates have now been integrated into this class for the purpose of a more systematic classification (ADC – land aquisition, development and construction and IPRE – income producing real estate). The most fundamental change relates to the fact that the key classification now depends on whether the client's creditworthiness is dependent on collateral or not. In other words, the purpose of property is defined depending on whether it generates the cash flow for the repayment of the loan or not. A more rigorous treatment is for the loans whose repayment is in positive correlation with the cash flows generated by the property which is subject to mortgage, whether in the form of sale or renting. A commonly accepted perception is that such exposures, following *ceteris paribus* assumption, are always more risky than the exposures whose repayment is not materially dependent on the property.

Additional (add-on) factor for currency mismatch has been expressly defined to stand at 50%, as an add-on to a certain risk weight, whereby the maximum level of total risk weight, including the add-on, may not exceed 150%. The use of add-on was proposed to include the corporate clients as well. The second consultative document mentions for the first time the revision of defaulted exposures. The main development constitutes the introduction of additional eligibility criteria for this type of exposures, in line with the IRB approach. Additionally, the past due concept now relates not only to the loans, but to all types of exposures owned by the bank.

The future of F-IRB approach

Some evident deficiencies existing within the F-IRB approach are being discussed by the Basel Committee [11], attempting to seek the modalities for its improvement. The ultimate goal is reducing the variability of RWA due to the degree of discretion provided to banks. The means to achieve this is the convergence of the SA and F-IRB approaches in a sense that there should be no major discrepancies between these two, thereby mitigating the moral hazard effect. The consultative document above is based on the restrictions being introduced or modified in the application of the F-IRB. The first among a number of key changes anticipated from the consultative document refer to the complete prohibition of using the F-IRB, that is, its restriction for certain classes:

- exposures to banks and other financial institutions (including insurance companies)
- exposures to corporates belonging to consolidated groups with total assets exceeding EUR 50bn
- exposures to equities
- exposures to specialised lending

RWA for these classes will be defined solely based on the SA approach.The reason for such decision was the empirical evidence of high variability of parameters used for calculation in the F-IRB. The focus is here on PD as the only input calculated by the banks on internal basis. The analysis noted that the banks have a rather similar grading of same clients and the assessment of their relative

Table 8: Risk weights for exposures secured by real estate (the second consultative document)

Exposures secured by RESIDENTIAL real estate						Exposures secured by COMMERCIAL real estate		
Repayment not materially dependent on the cash flows generated by the property								
LTV ≤40%	40%<LTV ≤60%	60%<LTV ≤80%	80%<LTV ≤90%	90%<LTV ≤100%	LTV > 100%	LTV ≤ 60%	LTV > 60%	
25%	30%	35%	45%	55%	RWc*	Min (60%, RWc)	RWc	
Repayment materially dependent on the cash flows generated by the property								
LTV ≤ 60%		60% <LTV ≤ 80%		LTV > 80%		LTV ≤ 60%	60% <LTV ≤ 80%	LTV > 80%
70%		90%		120%		80%	100%	130%

* RWc – client's risk weight
Source: Basel Committee [10, pp. 36-37]

risk, that is, the comparative aspect of one client's risk compared to the other clients' risk. This implies that the applied models managed to exercise their main function of discrimination of clients based on their creditworthiness, however, the estimates of PD provided by them vary considerably. The issue here is that classes, banks and large corporations, due to the nature of their portfolio, have an exceptionally low percentage of defaults, which precludes the construction of the model due to insufficient information for developing a pool of "bad" clients. In statistical terms, the impartial assessment of parameters in the model is significantly affected, therefore, the SA emerges as the necessary alternative.

Another major modification relates to changes in and introduction of new limitations of components of risk in RWA function (PD, LGD and EAD). For the F-IRB, the most relevant changes relate to PD, while the introduction of restrictions for other components of risk is associated with the A-IRB approach.

The third part of changes also targets the assessment of parameters produced through internal models and the modification of fixed parameters defined by the supervisor. All major proposed changes are presented in Table 9.

Alongside the consultations on the modification of approach for credit risk runs the consultation on introducing the capital limitations [7], the so-called capital floor, as a mandatory relation between the SA and IRB approaches. The main motivation is the recurring intention of the Basel Committee to reduce the variability of RWA. Capital floor is considered only in case the IRB approaches are used when calculating the RWA. The concept implies that the SA approach is the bottom limit for the RWA, whereas the use of IRB may only result in its higher value. It is evident that the key differences between the two concepts are seen in the denominator of capital adequacy ratio (RWA), however there are some minor differences which affect its numerator (regulatory capital), and are associated with the correction of CET1/T2 capital, with respect to provisions for credit risks. Therefore, two options were proposed for the correction of numerator and denominator, whereby the use of the IRB approach is transformed into the SA resulting in a comparative basis for comparison. The multiplication factor, that is, the floor factor, needs to be determined and will be subsequently calibrated. The comparison procedure is shown in Figure 2.

Comparative analysis of proposed modifications of the SA and F-IRB approaches

Modification of the SA approach

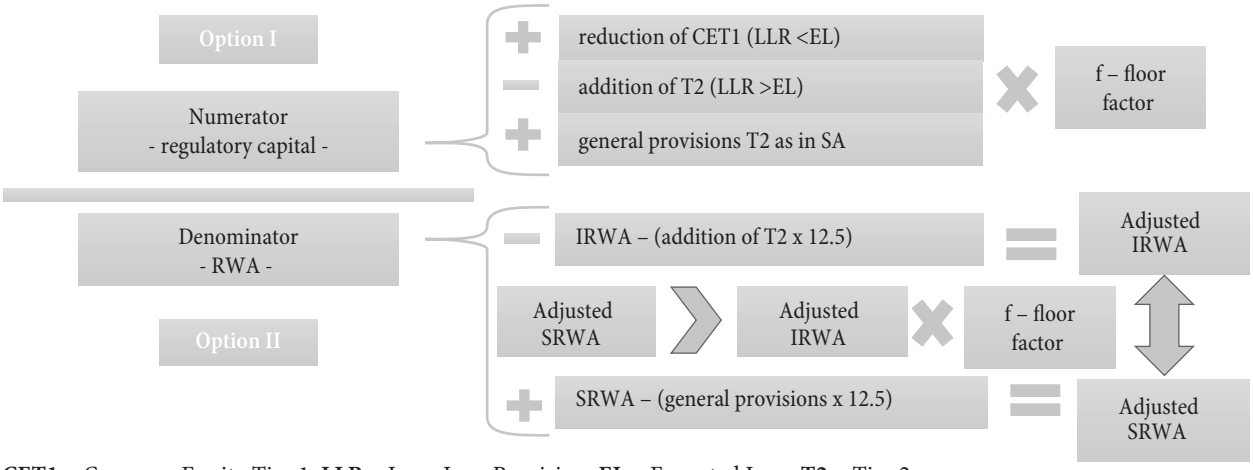
The first observation regarding the evolution of the SA approach is the lack of any indication about changing the classes of exposures. There are certain reallocations

Table 9: Proposed changes of F-IRB approach

Risk component	Consultative document	Basel II	Difference
PD			
Corporate	5 bps	3 bps	⬆ 2 bps
Retail			
Mortgages	5 bps	3 bps	⬆ 2 bps
QRRE transactors	5 bps	3 bps	⬆ 2 bps
QRRE revolvers	10 bps	3 bps	⬆ 7 bps
Other retail	5 bps	3 bps	⬆ 2 bps
LGD			
Haircut			
Receivables	20%	50%	⬆ 30%
CRE/RRE	28.6%	50%	⬆ 21.4%
Other physical collateral	28.6%	50%	⬆ 21.4%
Secured exposures			
Receivables	35%	20%	⬇ 15%
CRE/RRE	35%	20%	⬇ 15%
Other physical collateral	40%	25%	⬇ 15%

Source: Basel Committee and author's illustrations

Figure 2: Corrections for adjusting the IRB approach within the capital floor



CET1 – Common Equity Tier 1; **LLR** – Loan Loss Provision; **EL** – Expected Loss; **T2** – Tier 2; **IRWA** – RWA calculated through IRB; **SRWA** – RWA calculated through SA

Source: Basel Committee and author's illustrations

in place (between the exposures secured by real estate and exposures to corporates) and some more detailed definitions (the introduction of specialised lending into the class of exposures to corporates and introduction of other retail exposures), however, there is no mention of any substantial change in terms of elimination or addition of some entirely new classes.

The pillar of the initial proposal for the modification of the SA approach was the original opinion that the CRA ratings needed to be entirely removed from use within credit risks. Such procedure may be justified on a number of grounds. In their paper, Hilscher and Wilson [16] provide a number of arguments which are not in favour of CRA ratings. Above all, even a very straightforward model developed by logistic regression, based on publicly available information and market indicators, remains superior in comparison to CRA ratings. The two dimensions are highlighted, which a perfect measure of risk should integrate in itself, and these are raw default probability (PD) and systematic risk. CRA ratings are failing to predict the first dimension in a proper manner, which is particularly an issue due to the fact that PD is a backbone of RWA calculation in the credit risk process. It may be concluded that even a very simple internal model developed in banks is a better alternative than CRA ratings. On the other hand, a systematic risk is very well reflected in CRA ratings, as the principal component analysis has proved that there is a single factor which dominates and accounts for even 70% of default variations. This is the so-called "failure beta", and is being particularly highlighted as a measure of systematic risk.

Creditworthiness is perceived from two aspects, at a point in time (PIT) and through the cycle (TC). Considering that the capital calculation horizon based on both regulatory requirements and the ICAAP system is one year, in order to calculate the capital adequacy, PIT aspect is more appropriate. In the process of awarding the rating, rating agencies are focused on TC aspect, which is why its inflexibility and seldom changes are so insisted on. Only in cases when firm evidence is provided on the substantial change in an entity's creditworthiness is his rating changed. An issue in the use of CRA ratings for the calculation of RWA lies exactly with this imbalance. Ratings actually reflect TC aspect, yet are used within the framework focused on PIT aspect. Such controversial position is even more intensified by the fact that in the prediction of defaults, the discriminant power of PIT approach is much stronger than TC approach [19]. Procyclicality is also one of the issues arising with respect to the use of CRA ratings. Such issue is particularly relevant in stress scenarios, that is, during the outbreaks of crises, as this is the period when the procyclicality becomes relevant. Contrary to the commonly accepted informal attitude that CRA ratings are explicitly procyclical and follow the reactions to changes in general business terms after such changes occur, it was confirmed that procyclicality is in

place only to follow the investment grade ratings and is particularly strong in changes of rating, but not changes in their level [2].

Based on all the above, it is evident that CRA ratings do not constitute the perfect indicator in the calculation of RWA, but they are certainly an alternative in such an approach. The original intention of the Basel Committee to replace them with risk drivers is indeed an interesting approach, as it largely reminds of the application of internal assessment of credit risk in banks. Consistent with the principle of simplicity, it was required to use only very few indicators, the combination of two, to describe a bank's risk position, which proves to be extremely inconvenient due to the heterogeneity of entities. This is particularly visible in the corporate class, as it is very much certain that various business activities affect the different values of financial analysis indicators. In exposures to banks, CET1 ratio has been largely standardised owing to the application of procyclicality, however, the question remains relating to NPA ratio which is to a greater extent subject to different accounting rules. The Basel Committee undertook to consider all these issues during the implementation, yet it is evident that such an approach would encompass all the clients in a uniform manner. CRA ratings are reserved only for large corporate systems, which excludes their use for great majority of calculations of exposures in the banks' portfolios. It is also noticeable that much finer grading method is proposed, through the application of risk drivers, including as many as 16 weights for exposures to banks and 13 weights for exposures to corporates, unlike the Basel II method which, however, remained in the second consultative document, and contains only 5 weights for banks and 6 risk weights for corporate segment. A more rigorous treatment is observed for the clients who meet the criteria based on which they are assigned the risk weight of as much as 300%, which is doubled in comparison to Basel II. Even though it has been reiterated that the intent of the Basel Committee is not, under the proposed changes, to increase the capital requirements through increased calculation of RWA, the Quantitative Impact Study (QIS) of the proposed changes confirmed that it had inevitably occurred. The main motivation was to increase the risk sensitivity, however, it was probably due to more rigorous risk weights that the RWA increased substantially. This issue is highly debatable as Mariathasan and Merrouche conducted an empirical analysis based on the data during the last banking crisis 2007-2010 and the resolution of banks, which implies recapitalisation, nationalisation, bankruptcy and forced merging, and proved that RWA ratio has no greater power of prediction and is inferior to the unweighted leverage ratio in periods of stress [21]. RWA ratio implies the relationship between the RWA and total assets, which suggests that the ratio shows how many RWA units there are to one unit of assets. In other words, the ratio reflects a bank's risk profile, determined in accordance with the credit risk calculation. On the other hand, the unweighted leverage ratio has the same function and the meaning as in corporate finance, as it is the ratio between the capital, and in this case the regulatory capital was defined with special calculations for T1 and T2, and total unweighted assets. RWA ratio has a better power of prediction of a bank's resolution in normal market conditions, however, it is useless in the periods when it should be the most useful, that is, during the outbreak of crisis. The fact is, however, that the regular leverage ratio may be used to better point to potential problems in a bank's operations in periods of stress in the market, and this is sufficient evidence that the overall Basel II framework for calculating the capital adequacy actually failed, which is also one of the main reasons for the modification of regulations. This includes the SA and IRB approaches as well. "If the decline in the RWA/TA ratio is the result of the change towards seemingly safe assets, regulators are consequently responsible for incentivising investment in what turned out to be the overly risky ("toxic") assets. If it is instead a matter of manipulated risk weights, regulators are to be held accountable for trusting the banks to adequately assess themselves for exposure to risk" [21, p. 16]. The essential conclusion is that the need exists for the comprehensive modification of RWA calculation framework, which is why the proposed changes in the initial document were, in some segments, perhaps the step in right direction. It is evident that the level of calculated RWA was significantly underrated through the implementation of Basel II.

The second consultative document relating to modification of the SA rejected the initial extreme move towards the removal of CRA ratings. The pressure and the responses of a large number of participants indicated that CRA ratings still had an important role in the overall functioning of financial markets and banking industry and may not be neglected in entirety. The due diligence concept is now proudly announced and the banks will need to perform it within their own internal credit risk management. Alongside due diligence, an issue of moral hazard has arisen integrated within such an attitude, as the banks are now expected to indicate that certain exposures are riskier than the ones assessed by external credit agencies. Therefore, its implementation in practice could create room for additional interpretation, because in such cases, the banks would feel encouraged just to confirm the base risk weight identified by CRA ratings. It is understood that large scale manipulations of risk weights are precluded by eliminating the possibility of improving the risk weight owing to due diligence, as the flexibility exists only "in upward direction", however, the problem remains in cases if the CRA rating overestimates the actual entity's creditworthiness, the banks then will not feel encouraged to prove that the actual risk exceeds the one assessed by the external rating agency. This implies that some major changes in the substantive framework for the focal exposure classes, such as banks and corporates, lack when compared to the current Basel II regulations. It is certain that the introduction of a finer grading method for exposures secured by real estate results in higher risk sensitivity, due to different LTV ratio levels. This is the key risk driver for such exposures and this is the reason why highlighting its discriminant power is so important.

Modification of the F-IRB approach

F-IRB approach calls for additional attention as when applied, the banks assume the role of self-regulators. Therefore, the composition of its framework must be established very diligently and a minor change in the setup may result in major distortions in RWA calculations. The need for the modification of this approach was an imperative due to already proven theoretical and empirical deficiencies.

The very essence of the approach, the use of internally developed models for assessing credit risks in capital adequacy calculations, constitutes a solid basis for the setup of problem of moral hazard. Even though the laid down criteria and rules for the implementation tend to mitigate the issue, it is beyond doubt that banks are encouraged throughout the process to lower the perception of RWA level. The susceptibility to game theory is present particularly in the aspect of information asymmetry, with respect to rating identification, as during the process of internal rating identification, some information may be intentionally omitted or diverted, and yet such information may have the material impact on the actual loan risk [12]. Failure to use such information results in the illusion of more secure loans. In general, the examples of good practices of internal ratings should possess the feature of informational efficiency [18]. The analogy of internal ratings may be found with the functioning of financial markets and the theory of their efficiency which implies that the prices of securities should reflect within themselves all publicly available information. In the case of internal ratings, this is generally observed in a way that ratings should incorporate within themselves all the information about the issuer and the transaction the bank is concluding with it, so as to gain a realistic overview of the risk of such exposure.

The scope of discrepancy may be perceived through a common setup of regulatory rules wherein there is room to choose between the SA and IRB approach [14]. In such a case, only large banks would opt for IRB for its high implementation costs. By doing so, they gain competitive advantage by reducing the capital requirements. Higher profitability requires additional funds, due to which the interest rates for deposits are increased. The reaction of small banks is such that they can only attract inferior clients who are willing to accept the higher interest rates. The result of all these moves is higher systemic risk which may cause distortion in the market. The point here is that there exists the discretionary right to choose, which is to some extent conditioned by high fixed costs, while in the case of mandatory use of IRB approach only, some benefits are gained for the national economy, due to better allocation of capital in comparison to the SA approach. In other words, there is much greater risk sensitivity. The

previous claim is valid only in case the fixed costs of the IRB approach are not higher than the benefits gained by this approach with respect to allocation of capital.

The proof that the use of IRB approach lowers the RWA level has been empirically confirmed through the analysis of indicators of banks which underwent some form of resolution (recapitalisation, nationalisation, bankruptcy, forced merging) during the last crisis from 2007-2010 [21]. The manipulation of risk weights may be reasoned by concluding that the banks which adopted the Basel II rules at an early stage experienced the extreme reduction of RWA ratio. RWA ratio was shown to be losing its predictive power in periods of stress for the early adopters, which leads to another conclusion about the manipulation of risk weights. A particularly interesting case was in the USA market as the national supervisor ordered that advanced approaches (IRB) should be mandatory for large banks, while it was optional for other banks. In their paper, Mariathasan and Merrouche explored the relations between the banks which implemented IRB and the ones which did not, with respect to identifying the prediction indicators of their resolution. An important conclusion was that IRB had been adopted by the banks which were inferior, in terms of quality of assets. This implies that IRB approach was attractive to riskier banks which intended, through its implementation, to understate the actual value of RWA, and by doing so enable lower capital requirements. Such a setup causes serious concerns and points to a need for a more restrictive use of IRB approach.

This was exactly one of the guiding ideas for the Basel Committee to entirely eliminate the IRB approach for certain classes, as described in section three, mitigating thereby the moral hazard effect to some extent. Modelling will be limited only to the classes which pretend to be retail-oriented, due to their scope, in terms of clients and default rate. In this way the efficiency of parameters is significantly increased, as the impartiality, as well as other relevant features of statistical assessment of model parameters, increases with the increase of clients in the samples which serve as the basis for model construction. By increasing the number, the assessments of parameters are nearing their actual value in an asymptotic manner. The problems with modelling were also pointed to by Helwig in his paper [15], stating that insufficient amount of time series data, which in combination with their nonstationarities significantly affects the quality and usability of the model. The additional complication is present in credit risks, as defaults are rare events in practice. This claim may be used to justify the above attitude of the Basel Committee in its consultative document for complete elimination of modelling in the low-default portfolios.

In the above consultative document there is no mention of any radical changes in the very architecture of the F-IRB approach. The functional form for the calculation of RWA has remained unchanged and there are no indications about its modification. In the consultative document, the Basel Committee does not address this subject and its limitations in any of its aspects. The main model has remained the same, built on the foundations laid by Vasicek in his paper from 1987 [24]. This is the one-factor model built upon the Gaussian copula method. The model includes the systemic component which may not be diversified and an idiosyncratic component relevant for that very entity. An analogy may be found here with the famous Sharpe's CAPM model referred to in portfolio analysis, as there is a distinction between a systemic risk, common for all the clients in the portfolio, and a non-systemic risk, inherent only to an individual client in the portfolio. In essence, these models have emerged as a result of principal component analysis (PCA), the intent of which is to replace the series of data with a number of main components which constitute the valid representation. These models rely on the first component, in a sense that there is a single factor which has a dominant effect on the systemic portfolio risk to which all clients are exposed. The formula used in calculation of the F-IRB approach for corporate, sovereign and bank exposures is as follows:

$$\textit{Capital requirement}\ (K) = [LGD\times N[(1-R)\text{^} - 0.5\times G(PD) + (R/(1\text{-}R))\text{^} - 0.5\times G(0.999)] - PD\times LGD] \times (1-1.5\times b)\text{^} -1\times(1+(M-2.5)\times b)$$

The main output of the F-IRB model is PD which constitutes the measure of raw client risk, and as such displays the measure of idiosyncratic risk. In their internal models, the banks make use of various techniques to calculate PD. The quality of such calculation is critical for all subsequent calculations which further affect RWA.

This particularly refers to the calculation of correlation parameter (R) as it represents the other aspect of risk, as mentioned above – the systemic risk of the market the client is operating on. There are no indications about the changes of the formula for calculating the correlation, and for the above classes, it is calculated as follows:

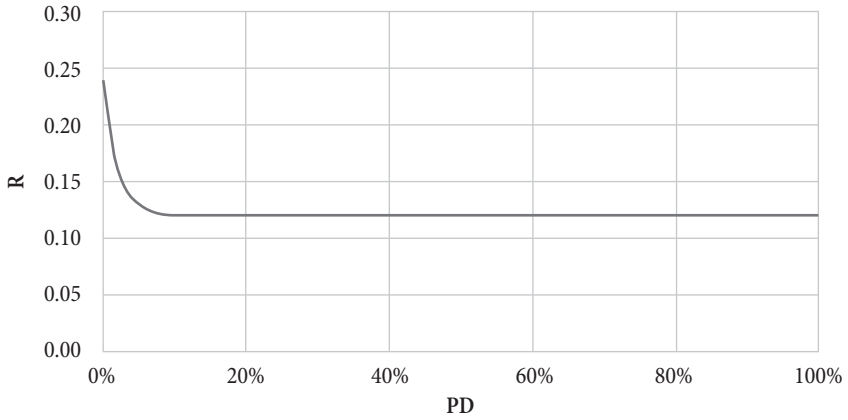
$$Correlation\ (R) = 0.12 \times (1 - EXP(-50 \times PD))/(1 - EXP(-50)) + 0.24 \times [1 - (1 - EXP(-50 \times PD))/(1 - EXP(-50))]$$

Correlation is expressed in the function relative to the calculated PD amount, whereby these two are in inverse correlation, in a sense that higher PD value requires lower correlation value, and vice versa. This is justified by the perception that if the company is in increasingly adverse financial situation, its PD will rise accordingly, and the dominant factor will include the operating features which are characteristic only for this company, whereas the systemic market impact is losing importance [20]. The correlation is shown in the figure below.

The above inverse correlation is evident, however, there is a range for the value of R which may not be lower than 0.12 or exceed 0.24. One of the reasons for the mentioned RWA anomalies during the last crisis may be identified within this calculation, as it is widely known that in periods of stress, the systemic factor is given a lot more relevance, while the calculation in accordance with Basel II relates to normal market conditions. The empirical analysis conducted by Lopez during the 2000s [20] on the calculation of correlation shows that the average values, at 99.9% confidence level, stood at 0.1625 for the U.S. market, 0.2625 for the Japan market and 0.1375 for the Europe market. The Japan case is the most interesting one as the country was undergoing recession at the time of research, which was reflected in the higher amount of correlation parameter. These results could be a pathway for analytical improvement of the F-IRB approach, whereby the identification of the correlation parameter within the RWA calculation for one market could be conditioned by the status of the business cycle the market is going through. The range of potential values for R could be expanded towards higher ceilings in cases of periods of stress. Even though the proposal about the flexible value of R parameter would have an adverse effect on the simplicity principle, the national regulators would be able to identify the range of correlation of this parameter with the situation of the market under their jurisdiction. On the other hand, such procedure would significantly improve the sensitivity to capital calculation risks. Such type of correlation could be calibrated on the basis of realistic data available to the national supervisors for their own market.

For the economies with exceptionally developed financial markets, the best models are the ones which are based on the market value of the company, as the share prices in the capital market are the best indicator of the company's operations and future perspective. The basis for these models was taken over from the option pricing theory and in essence, they can all be traced back to Merton or Black-Scholes model. The problem with this type of model is that they are inapplicable in practice in jurisdictions without developed capital markets. An alternative may be some statistical (econometric) model, also referred to as the actuarial model, the emergence of

Figure 3: Relationship between PD and R



Source: Author's calculations based on Basel II standard formula

which was marked by the revolutionary work of Altman [1], on which basis the famous Z-score was developed. This marked the introduction of quantitative metrics in assessing the company's financial position, with a view to determining the quality of its ability to "survive" and achieving the going concern principle. The main method applied in this work was the discriminant analysis, used to distinguish between "good" and "bad" clients. Further progress in developing the model for bankruptcy prediction was introduced by Ohlson [22] who, for the first time, used the logistic regression as technique. The upgrade of the model was developed by Shumway [23], introducing the improved analytical structure through hazard rate model, and it relies on the probability of survival in the non-default status. The major advantage of logistic regression is that it inherently and directly states PD. In addition to these approaches, the techniques in internal bank rating systems are sometimes the scorecards (rating patterns based on expert experience/opinion), fuzzy logic systems, and recently, the principles of behavioural finance have increasingly been introduced. Basel II does not prescribe any specific model/technique for the calculation of PD, but only the characteristic of the satisfactory model. This is due to the principle upon which the internal modelling approaches are based in general, which implies that the banks are not imposed the specific requirements with respect to selection of a model, as the general perception is that the banks are best familiar with their own portfolio and adjust their models to it. This position could be reconsidered in a sense that the Basel Committee should prescribe, in a clear and unambiguous manner, the techniques which may be used in the calculation of PD. A very short segment in the consultative document suggests that certain limitations for the assessment of PD are being considered. This could be done by analysing the existing models, with a particular emphasis on their results during the last crisis, in which case only the best practices regarding the models which proved to be appropriate would be integrated into the conditions for using the F-IRB approach. Likewise, the upgrade could also be done with respect to a more precise definition of validation that the models need to meet in order to be eligible to be used in the calculation of RWA. The quantitative parameters of validation would then have the role to filter and determine in an objective manner whether the model meets the requirements or not. These parameters could be set in a manner which would expressly specify the minimum amounts of the tools used for assessing the validation of the model, such as, for example AR (Accuracy Ratio) or ROC curves (Receiver Operating Characteristic). This would result in a higher level of objectivity during the regulator's assessment of the appropriateness of the model. At the same time, some minimum standards would be specified for out-of-sample tests and the amounts of data which need to be used as inputs in model construction.

In addition to the prohibition of using the F-IRB approach for some classes of exposures, already referred to in the section The future of F-IRB approach, another major change refers to the introduction of differentiated minimum PD rate and the change of its value. The minimum rate was increased from 0.03% to 0.05% in all classes, except for QRRE Revolvers where the proposed minimum rate is 0.10%. A direct consequence of such proposal is the increase of the minimum risk weight.

The more rigorous approach complies with the described deficiencies identified in the application of the IRB, and this is the reason why the increase of minimum values is a welcome development. QRRE – Qualified Revolving Retail Exposures is divided into two sub-classes: QRRE transactors and QRRE revolvers. Table 10 shows that the proposed changes would not result in a significant increase of minimum risk weights (only in corporate segment, the increase would exceed 5 p.p.) and they would remain significantly below the values prescribed by the SA approach.

Conclusion

Further evolution and improvement of approaches for credit risk is an inevitable step which needs to come to life in the forthcoming period. The identified deficiencies in the RWA calculation system must be eliminated through new modifications which would allow for a more realistic overview of risk for some positions.

The proposed modifications of the SA approach in the initial document started with a radical change which would imply the removal of CRA ratings. Risk drivers

Table 10: Minimum risk weight in F-IRB approach (Basel II vs. consultative document)

Class	LGD	Minimum risk weight		
		Basel II	Consultative document	Difference
Corporate (turnover 50 mil EUR)	45%	14.44%	19.65%	⬆ 5.21%
Corporate (turnover 5 mil EUR)	45%	11.30%	15.39%	⬆ 4.09%
Residential mortgages	45%	4.15%	6.23%	⬆ 2.08%
	25%	2.30%	3.46%	⬆ 1.16%
Other retail exposures	45%	4.45%	6.63%	⬆ 2.18%
	85%	8.41%	12.52%	⬆ 4.11%
QRRE transactors	45%	0.98%	1.51%	⬆ 0.53%
	85%	1.85%	2.86%	⬆ 1.01%
QRRE revolvers	45%	0.98%	2.71%	⬆ 1.73%
	85%	1.85%	5.12%	⬆ 3.27%

Source: Basel Committee and author's illustrations

emerged as a substitution for these ratings, and they could achieve much greater scope of application and increased objectivity. The issues relating to their implementation have been identified, however, it is evident that there exist numerous arguments which are not in favour of CRA ratings. The fact that they are inferior regarding the prediction of defaults, their focus on TC instead of PIT aspect, which is dominant in the capital adequacy process and their procyclicity, are more than sufficient reasons to call for the review of their further use. Furthermore, such a framework is not adjusted to a broader context of banking industry, even though external credit agencies are expanding the range of their estimates. On the other hand, it is understood that CRA ratings have an important role to play in the overall financial system and that their relevance in assessing the entity's financial position undoubtedly has an effect on investors. The Basel Committee has given up on these revolutionary ideas, and in the second consultative document, it resorted back to its original Basel II approach. This kind of wandering for the solution is sufficient evidence of the complexity of the issue. Some minor changes have been proposed which fail to achieve the substantial modification of the framework for the SA approach. An issue is in what way these minor changes would provide an adequate response to the confirmed abnormalities in RWA calculations during periods of stress. The key aspects of the resolution of banks during the turbulent period from 2007-2010 are sufficient evidence indicating that the modifications in the credit risk framework need to be fundamental. The introduction of due diligence principle cannot be a development which is to contribute to a significant increase of risk sensitivity, as its very structure already has an integrated moral hazard issue.

F-IRB approach is particularly sensitive to changes as its theoretical and empirical deficiencies have been proven. In the proposed consultative document, the Basel Committee fails to address the core architecture of the F-IRB approach, but rather, remains focused only on the prohibition of its use for certain classes which need to be described through the SA approach, as well as the modification of certain limitations in risk components. The main motivation for all proposals is the reduction of RWA variations and increasing convergence of the IRB and SA approaches. An improvement of its analytical architecture would be an upgrade with respect to changing the range of potential values of correlation parameter, in accordance with the status of the business cycle. The aspect of validation and subsequent approval for the use of model could be further standardised by introducing the quantitative criteria. Only the models which are able to meet high and predetermined values for the validation techniques could be used in the F-IRB.

The above analysis addresses the major challenges to be faced by the Basel Committee, regarding the functioning of the credit risk framework. One of uncommon ideas regarding the approach to this issue would perhaps be the introduction of "the third direction", which would imply the hybrid approach, as a symbiotic form of the IRB and SA. Its basis would include the models developed by the regulators for their national markets. Due to the fact that regulators are in possession of the data for the entire

market on the default status of all bank clients, this would significantly improve the quality of parameters which would be uniform for all banks. The data would then be combined with the data from the register of companies' financial statements, in case of corporate segment, while for retail class, the model would be developed based on the qualitative and quantitative data submitted by the banks. The models would be developed only for the classes which are, by their nature, dominant in the regulator's jurisdiction, while the remaining classes would be subject to the SA approach. This is the way to achieve the uniform approach for all, and the clients' risks would be placed within the context of the market they are operating on.

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ORIGINAL SCIENTIFIC PAPER
UDK: 339.727.22
330.34(497.11)
DOI:10.5937/EKOPRE1706381R
Date of Receipt: February 12, 2017

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THE IMPACT OF FDI ON THE ECONOMIC DEVELOPMENT OF SERBIA[1]

Uticaj stranih direktnih investicija na ekonomski razvoj Srbije

Abstract

Previous studies that attempted to answer whether FDI contributes to economic development of the host economy came up with conflicting results. Scientific community is still divided over the very concept of spillover effects, which is based on the thesis that FDI has a positive effect on local companies, thus stimulating the host economy. According to this theory, employment growth is among the main benefits of FDI inflow for the host country. Given that unemployment is the biggest problem of the Serbian economy, FDI is perceived by the public as the best remedy for alleviating the consequences of the transition period and rapid privatisation. Convinced in the omnipotent effect of FDI on the economy of the host country, the Republic of Serbia has invested significant resources in their subsidising. This policy of attracting foreign direct investments was implemented through non-transparent measures, which resulted in the inflow of FDI whose main purpose was to obtain the share of the market or provide lower operating costs through privatisation. It was unclear whether the FDI inflow of over 20 billion euros contributed to the economic development of Serbia in the2001–2013 period. The author attempted to provide an answer to this question by using correlation analysis, in order to determine whether there is a relation between FDI inflow and eleven selected indicators of economic development of Serbia.

Keywords: *FDI, Serbia, economic development, spillover effects, employment, wages, GDP*

Sažetak

Sva dosadašnja istraživanja koja su pokušala da pruže odgovor na pitanje da li strane direktne investicije doprinose ekonomskom razvoju zemlje domaćina, dala su različite rezultate i suprotne odgovore na postavljeno pitanje. Stručna i naučna javnost se i dalje spori oko samog koncepta efekata prelivanja, koji se zasniva na tezi da strane direktne investicije pozitivno deluju na domaća preduzeća, pospešujući time razvoj privrede zemlje domaćina. Među osnovnim prednostima priliva stranih direktnih investicija za zemlju domaćina, prvenstveno se navodi rast zaposlenosti. S obzirom na to da je nezaposlenost rak rana srpske privrede, strane direktne investicije percipirane su u javnosti kao najbolji lek za ublažavanje posledica tranzicionog perioda i nagle privatizacije. Uverena u svemoćno dejstvo stranih investicija na privredu zemlje domaćina, Republika Srbija je u posmatranom periodu uložila značajna materijalna sredstva u njihovo subvencionisanje. Ova politika privlačenja stranih direktnih investicija sprovodila se netransparentno, što je za posledicu imalo priliv onih investicija čiji je cilj bio privatizacijom pridobiti tržište ili obezbediti niže troškove rada. Ostalo je nejasno da li su strane direktne investicije uopšte doprinele ekonomskom razvoju Srbije u periodu koji karakteriše priliv od preko dvadeset milijardi evra. Autor je u radu pokušao da pruži odgovor na ovo pitanje koristeći se korelacionom analizom kako bi utvrdio postoji li kvantitativno slaganje između priliva stranih direktnih investicija i jedanaest izabranih indikatora ekonomskog razvoja Srbije.

Ključne reči: *strane direktne investicije, Srbija, ekonomski razvoj, teorija efekata prelivanja, zaposlenost, zarade, BDP*

1 This paper was created within the project "Serbia in contemporary international relations: Strategic directions of development and firming the position of Serbia in international integrative processes – foreign affairs, international economic, legal and security aspects", Ministry of Education and Science of the Republic of Serbia, No. 179029.

Introduction

Foreign direct investment (FDI) has become a phrase that Serbian politicians often repeated during the past decade, almost like a mantra, in order to rescue the ailing economy and to win votes, in a way that any review of the effects of these investments on the domestic economy was a sort of blasphemy. FDI was attributed with almost fantastic performances, and its magical effect on economic development was accepted as an axiom. From 2000 to 2013, Serbia introduced a number of measures which facilitated and liberalised the inflow of FDI and the transfer of capital, while privatisation was the main form of investing in Serbia. Subsidies for foreign investments were the highest in the region. The conditions under which these subsidies were granted remained non-transparent, while the most valuable contracts with foreign investors remained secret. In the decade in which Serbia attracted substantial foreign investments, it is unclear how much of this investment really affected the country's economic development.

The main research question was: Did FDI stimulate economic development of Serbia from 2001 to 2013? The basic assumption is that FDI creates jobs, but it should be noted that the most significant investments in Serbia came through privatisation, which included layoffs, while green-field investments were an exception rather than the rule. Therefore, the author was interested in finding out whether there was a causal link between FDI and local economic development. In other words, in the case study of Serbia, the author attempted to provide an answer to the question of whether foreign direct investments promote the economic development of the host country. The research was time-limited to the period from 2001, when the country began to liberalise its investment and trade policy, until the end of 2013.

In this research, a correlation analysis was employed – a technique by which correlation between FDI inflow and indicators of economic development is determined. The author wanted to prove that the theory of spillover effects has its limitations and that it is fundamentally misplaced. The defects of this theory were visible to the naked eye in the case of Serbia, which attracted, from 2001 until the end of 2013, about twenty billion euros of FDI. This FDI did not produce the desired effects on the domestic economy. The negative indicators of economic development in Serbia mostly relate to the number of employees and the unemployment rate, which was higher in 2013, than in 2005. Therefore, the author's argument is based on the thesis that FDI did not cause significant spillover effects on the Serbian economy, and that it didn't contribute to the economic development of Serbia.

FDI and economic development of the host country

There are many definitions of foreign direct investment (FDI). Oskar Kovač claims that direct investment is any form of capital investment in an enterprise that acquires ownership control over it[10, pp.280–281]. The International Monetary Fund (IMF) states that foreign direct investment is investment undertaken abroad by a direct investor, resident of one economy/country in order to take control or permanent stake in a company that operates in a different economy/country[9, p.101].The Organisation for Economic Co-operation and Development (OECD) points out that FDI is created when a company resident in one country is establishing a lasting interest in enterprise which is a resident of another country[19, p.48]. The United Nations Conference on Trade and Development (UNCTAD) defines FDI as an investment involving a long-term relationship and reflecting a lasting interest and control of the company which is a resident of one country by a parent company resident in another country. Since the main feature of FDI is taken to be the lasting interest of a direct investor in an enterprise, only capital that is provided by the direct investor, either directly or through other enterprises related to the investor, should be classified as FDI [33, p.245]. Although different authors and international organisations offer different definitions, for the purposes of this research FDI will be defined as a kind of international movement of capital by which a foreign investor acquires the right to execute control over the company in which he/she invested capital.

The first authors who studied foreign direct investments and the possibility that they directly or indirectly cause the transfer of superior technology and knowledge to enterprises in the host country, were Caves in 1974, who conducted

his own research on the case of Australia, Globerman in 1979, exploring the impact of foreign direct investors in Canada, as well as Blomstrom in 1986 who conducted extensive research in Mexico [5, p.6]. These authors laid the foundations for the theory of spillover effects, which was empirically investigated all over the globe. Numerous researches came up with opposite conclusions, but the theory is still valid, although the spillover effects cannot be confirmed with certainty. This research will stand as another empirical verification of the theory that relies on the hypothesis that transnational companies cause positive effects on the productivity and competitiveness of domestic enterprises, thereby accelerating the economic development of the host country.

Theories that explain FDI claim that a company needs to possess certain specific advantage if it decides to internationalise its production. This specific advantage refers to a certain kind of improved productivity, technological superiority and specific knowledge that the investor possesses in comparison to domestic enterprises [18, p.5]. In other words, companies from abroad that invest in the host country operate at a much higher technological and technical level than it is the case with domestic enterprises. On the other hand, the foreign investor is being exposed to competition from domestic enterprises that know the domestic market and customer preferences well, and already have a developed supply chain. The theory argues that domestic companies will take all the necessary steps to preserve their profit and market share, which is being threatened by the arrival of foreign investors. They do this by trying to compensate for the specific advantage that a foreign investor has, by copying its technology or finding new and more efficient uses for existing resources. Incentives and opportunities for local businesses come from the necessity of foreign investors to establish their own supply chain in the host country. This means more work for local companies, which will have to meet the technical and technological standards required by foreign investors, thereby improving their productivity and competitiveness. The essence of the theory of spillover effects, which is often called the theory of technology transfer, is the inevitability of direct or indirect technology transfer from FDI to domestic companies. Technology in this sense can be in the form of superior technology, unique know-how, marketing skills, achieved economies of scale, the international supply chain, and all other kinds of advantages.

By examining this inevitability, Aitken and Harrison presented a not so optimistic study in 1991, which was related to FDI in the manufacturing sector in Venezuela in the period from 1976 to 1989. These authors conclude that domestic suppliers were not able to benefit from the presence of FDI, because foreign companies procure draw materials and semi-finished products almost entirely though import [2]. On the other hand, one of the studies that allegedly prove the existence of spillover effects from FDI to distributors and retailers in host economy is the one published by McAleese and McDonald in 1978. Although they claimed that in Ireland the technology transfer from the FDI shed in both directions, to suppliers, as well as to distributors in the country, this conclusion could not be empirically verified [14].

The aforementioned pioneer studies by Caves, Blomstrom and Globerman examined the effects of foreign presence on labour productivity of local businesses. Although these authors were not able to determine ways in which the technology and knowledge spread to domestic enterprises, all three studies came to the same conclusion – local businesses increased their productivity in sectors where foreign capital was present[3, p.125]. In a similar way, Gorg and Strobl concluded that FDI can be of use to local companies, not only through transfer of technology, but also through the so-called externalities. In other words, foreign investors increased the demand for local products and services that are used in everyday business, primarily at the local level, which enabled local companies to increase productivity [6].

Some of the research carried out in the previous years lead to the conclusion that FDI produces exclusively positive effects on the host economy, while others went to the opposite extreme claiming that FDI influences local businesses and host economy in a negative way. Lipsey and Sjoholm tried to solve this problem of opposing conclusions by offering the only explanation that seemed reasonable at the time. They concluded that different countries and their companies are in different stages of economic and

technological development, therefore not all of them have the necessary skills to benefit from the presence of foreign investments and their superior technology. Economies that are lagging behind the technologically developed countries will not be able to benefit from FDI, and their domestic companies will be the ones that are pushed out from the market [12].

Lall and Narula point out that FDI can lead to increased productivity in the host economy and growth in export value, but it does not necessarily have to be the case. Therefore, FDI will not necessarily produce spillover effects and increase competitiveness of the domestic economy. In other words, the spillover effects are not guaranteed, and FDI will not always have a positive impact on local economic development. They supported this claim by presenting numerous examples of Asian countries where FDI did not contribute to their economic development, and where foreign investors built their business strategies on the exploitation of labour and maintaining a low level of earnings [11].

In 1991,Nadiri claimed that the FDI from the United States acted positively on industrial production and overall productivity in Germany, Japan, UK and France in the period between 1968 and 1988 [15]. On the other hand, Hadad and Harrison showed that there was no significant spillover effect in the manufacturing sector in Morocco between 1985 and 1989. However, these authors pointed out that the presence of FDI encouraged local companies to be more productive, but only within the limits of their technological capabilities [7]. In other words, where FDI comes in with modern, superior technology, spillovers are impossible within the same industry sector. Domestic companies are simply unable to replicate this superior technology, which is the only way for them to survive in the market. Not only that FDI does not contribute to the spillover effects, but it is claimed that it has a negative impact on the competitiveness of domestic enterprises.

Indeed, numerous studies revealed not only neutral, but negative effects of FDI on domestic companies. One of those studies, conducted by Aitken and Harrison, found that transnational companies have less marginal costs owing to their specific advantages at the international level, and therefore are able to offer better prices and push out local businesses from the market [1].Hanson also concludes that there is weak evidence that FDI generates positive spillovers for host economies. He claims that plants in industries with a larger multinational presence enjoy lower rates of productivity growth and adds that there clearly is a need for much more research into the consequences of FDI [8].

One of the most common explanations of neutral or negative effects of FDI on domestic economy is that not all companies are able to benefit from the presence of the FDI, therefore the spillover effect depends on the absorptive capacity of local enterprises. Kokko explains this capacity as the power to accept and input newly arrived knowledge and technology, and that it will depend primarily on the size of the technological gap between FDI and the local company. In other words, domestic enterprises will be able to benefit from the presence of FDI only if the technology gap is not too great in favour of FDI. If domestic companies are significantly inferior in terms of technology, they will not be able to absorb knowledge and technology from foreign direct investors. According to Girma and Gorg, this technological gap can be quantified, and they argue that local enterprises with a gap of 10% or less with regards to FDI will benefit from FDI presence, while the productivity of other domestic companies, with a greater technology gap, will decrease [4].

Current evidence of spillover effects, based on the numerous studies, is not sufficient and conclusive enough to confirm the thesis that FDI causes the transfer of technology. The very thesis that FDI stimulates local economy is unclear. In other words, previous studies were so different, in terms of methodology, that it is impossible to clearly determine whether the impact of FDI on the economy of the host country is positive or negative. Additional research is needed, and this one is yet another attempt to respond to the given problem.

Approach to the analysis and selection of indicators of economic development

This research is limited to investigating the impact of non-financial FDI – exclusively to foreign companies dealing with manufacturing, service providing and trade that have

invested their capital in Serbia. This is based not only on the fact that the most important world's stats in the field of international trade (UNCTAD, World Bank, Eurostat) separate financial from other FDI, but also because of the very theory of spillover effects, which assumes that the transfer of technology and knowledge comes from these sectors, while the impact of the financial sector is of secondary importance. In other words, it is highly more likely that the local companies and the overall economy will thrive due to the arrival of a car factory, than as a consequence of opening yet another foreign bank.

Following the decision to abstract the impact of the financial FDI, it was necessary to come to the relevant two groups of data. The first group is related to the FDI inflows in Serbia, that is, their value observed for each year from 2001 to 2013. The second group of data is related to the indicators of economic development, also for each year within the observed period. Within the first group of data, it was decided to use the database of the National Alliance for Local Economic Development (NALED). For many years now, this organisation has been compiling data into a special investment database that contains all the data on the important FDI in Serbia since 2000. By accessing this investment database, the author calculated that for the period from 2001 until the end of 2013, a total amount of 19 billion euros of non-financial FDI was invested in 81 cities and municipalities in Serbia [16].

As for the indicators of economic development, based on the data obtained from the Statistical Office of the Republic of Serbia, which are available in its yearbooks for all the observed years (2001–2013), it was decided to select the following eleven indicators:

1. Average mid-year population;
2. Total GDP in millions of euros;
3. GDP per capita in euros;
4. Real GDP growth in percentage;
5. Total number of employed persons;
6. Number of employed persons per 1,000 capita;
7. Number of employed persons in the manufacturing industry;
8. Number of employed persons in wholesale and retail trade;
9. Total number of unemployed persons;
10. Number of unemployed persons per 1,000 capita;
11. Average wages in euros.

The average population was used as a demographic indicator directly dependent on the overall economic situation. In the literature, the most common indicator of the economic situation of an economy is the gross domestic product (GDP), and that is why this parameter was selected to begin with. The unemployment rate could not be used as an indicator of the economic development of Serbia, since the methodology used by the Statistical Office of the Republic of Serbia to calculate this rate has changed since 2005. Given that there are no available data on unemployment rate, the data on the total number of employed and unemployed persons are used in the analysis, as well as the data on the number of employed and unemployed persons per 1,000 capita. In addition, the analysis includes the data on the number of employed persons in two main economic sectors: manufacturing industry and trade. This decision was made with the aim of gaining insight into the sectoral distribution of employed persons, and in changes in the Serbian economy due to FDI inflow, mainly through privatisation.

The correlation analysis was used as a statistical technique for determining the relation between FDI and economic development of the country, i.e. the impact of non-financial FDI on the economic development of Serbia. This technique is intended to determine whether there is a quantitative match between FDI inflows and indicators of economic development, as numeric phenomena, and whether there is a significant correlation between these two phenomena (variables). The results of the analysis are presented through the Pearson's correlation coefficients, which indicate the level of quantitative match of variations between two numeric phenomena. If the absolute value of a correlation coefficient is closer to 1, the match between two phenomena is greater, and if it is closer to zero, the match is lower. Only coefficients exceeding0.7 are considered to be indicators of a clear linear correlation between the trends of two observed phenomena, which proves that the trend of one phenomenon is dependent on the trend of the other [34, p.308].If the value of the correlation coefficient is positive, correlation between phenomena is positive, i.e. direct, since both phenomena show variations of the

same direction. If the value of the correlation coefficient is negative, this indicates that the correlation is negative, i.e. inverse – variations of the phenomena are moving in the reverse direction [13, p.644]. The coefficient of a simple correlation is calculated by using the following formula (it is irrelevant which phenomenon is marked with an *X*, or a *Y*):

$$r = \frac{C_{XY}}{\sigma_X \cdot \sigma_Y} = \frac{\frac{\sum XY}{n} - \overline{X} \cdot \overline{Y}}{\sqrt{\frac{\sum X^2}{n} - \overline{X}^2} \cdot \sqrt{\frac{\sum Y^2}{n} - \overline{Y}^2}}$$

In order for the research to be complete, and to undoubtedly prove whether there is a correlation between FDI and economic development of Serbia, a time lag was introduced into the correlation analysis as a factor. Under the assumption that FDI can cause spillover effects only after a certain amount of time (usually several years), the correlation analysis was done in three ways:

a) by calculating the correlation coefficient without a time lag;
b) by calculating the correlation coefficient with a one-year time lag;
c) by calculating the correlation coefficient with a two-year time lag.

This practically means that the impact of FDI inflows in Serbia on indicators of economic development in the year of the investment, the following year, and after two years, was separately quantified.

Correlation analysis

According to the NALED's data, 19.023 million euros were invested in Serbia through non-financial FDI during the observed period of thirteen years. FDI inflow was recorded in each observed year, and the highest inflow was in 2003, when almost 4 billion euros was invested in Serbia.

The population of Serbia decreased by approximately 337 thousand in the observed period, which was followed by a decline in the total number of employees. In 2001, there were 1.9 million employees in Serbia, and by 2013 the number decreased to 1.7 million. When observing the number of employees per 1,000 capita, this ratio is replicated: 246 employees per 1,000 capita in 2001, and 239 employed persons per 1,000 capita in 2013 in Serbia.

Table 1: FDI and economic development indicators of Serbia from 2001 to 2013

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
FDI inflow in millions of euros	212	1498.7	3981.1	464.6	817.6	3784.15	1035.6	1567.3	1012.2	624.5	1524.5	660.85	1183.5
Average mid-year population in thousands	7503.433	7500.031	7480.591	7463.157	7440.769	7411.569	7381.579	7350.222	7320.807	7291.436	7236.519	7201.497	7166.553
Total GDP in millions of euros	13805.457	17100.493	18737.964	19966.630	21103.299	24434.617	29451.573	33704.523	30654.677	29766.284	33423.801	31683.096	34262.945
GDP per capita in euros	1839.885	2280.056	2504.877	2675.360	2836.172	3296.821	3989.874	4585.511	4187.336	4082.362	4618.768	4399.515	4780.952
Real GDP growth in percentage	5	7.1	4.4	9	5.5	4.9	5.9	5.4	-3.1	0.6	1.4	-1	2.6
Total number of employed persons	1904477	1848531	1813570	2050854	2068964	2025627	2002344	1999475	1889084	1795775	1746138	1727048	1715163
No. of employed persons per 1,000 capita	246	246	241	275	278	274	271	272	258	246	241	240	239
No. of employed persons in the manufacturing industry	570613	511850	466942	483654	459950	420956	391897	370354	339428	311790	295363	289286	287147
No. of employed persons in wholesale and retail trade	125624	113373	108461	208279	204730	197807	196216	199495	193065	188706	183326	183973	180037
Total number of unemployed persons	780541	904494	944939	969888	895697	916257	785 099	727 621	730372	729520	738756	754603	769546
No. of unemployed persons per 1,000 capita	101	121	125	130	120	124	106	99	100	100	102	105	107
Average wages in euros	98.221	151.712	176.605	194.075	210.181	258.078	347.144	402.085	337.759	331.337	372.496	365.755	388.308
Unemployment rate (%)	x	x	x	x	20.8	20.9	18.1	13.6	16.1	19.2	23	23.9	22.1

Source: Author's calculation on the basis of [16] and [17], [20], [21], [22], [23], [24], [25], [26], [27], [28], [30], [31], [32]

By observing the indicators' trends, one notices the phenomenon typical of the transition countries: a decrease in the number of employees in manufacturing and an increase in the number of employees in trade, which is clearly evident in the case of Serbia. The number of employees in the manufacturing industry was cut in half during these thirteen years, while the number of employed persons in trade increased by 43%. The number of unemployed persons did not drop significantly in the observed period, however, given the decrease in population, and when observing the number of unemployed persons per 1,000 capita, an increase of 6% is observed. Since 2005, the unemployment rate decreased evenly by several percentages, and came at 24% in 2012. This is a disturbingly high value, and points out to the weakness of the Serbian economy.

Gross domestic product recorded a significant increase of 3.7% in the observed period, while the negative growth rate in Serbia was recorded in 2009 (-3.1%) and 2012 (-1%). The highest real growth of GDP (7.1%) was achieved in 2002. GDP per capita increased by 160% in the observed period, while the total GDP was 2.3 times higher in 2003 compared to 2001.

Considering the obtained results, it is important to note that the values of a correlation coefficient lower than 0.4 show a weak linear correlation between the two observed phenomena, while the values of the coefficient lower than 0.2 are statistically insignificant, meaning they show that there is no significant linear correlation between the observed phenomena. As it can be observed, there is no sufficiently strong linear correlation between FDI in Serbia and indicators of economic development (Table 2). Accordingly, it can be argued that a significant correlation between FDI and economic development of the Serbian economy in the period from 2001 to 2013 does not exist. Nevertheless, a relative correlation between FDI and specific indicators of economic development has been noticed, weak or moderate, though.

When observing the correlation coefficients in the analysis without a time lag, one notices an extremely weak linear correlation (0.2) between FDI inflow and fluctuation in population, meaning that these two phenomena can hardly be related. An inverse weak linear correlation (coefficient -0.28) exists between FDI and the number of employees in wholesale and retail trade, which means that in the year they arrived, FDI to a certain extent had to do with a decline in the number of persons employed in this branch of industry. The direct linear correlation of moderate strength was registered for indicators related to the number of unemployed persons, thus one can argue that FDI are responsible for the increase in the number of unemployed in the year of the investment. Specifically, the correlation coefficients relating to the total number of unemployed persons, as well as to the number of unemployed persons per 1,000 capita, range from 0.44 to 0.46, which are moderate strength values that point to the existence of a correlation between FDI

Table 2: Results of the correlation analysis

	Value without time lag	Value with time lag =1	Value with time lag =2
FDI inflow in millions of euros	1	1	1
Average mid-year population in thousands	0.207432	0.200860	0.120908
Total GDP in millions of euros	-0.101311	-0.082237	0.051088
GDP per capita in euros	-0.110090	-0.093767	0.038281
Real GDP growth in percentage	0.113052	0.296987	0.291825
Total number of employed persons	0.022876	0.388116	0.445162
No. of employed persons per 1,000 capita	0.010645	0.390594	0.486755
No. of employed persons in the manufacturing industry	0.076616	0.175223	0.155002
No. of employed persons in wholesale and retail trade	-0.284869	0.312368	0.461838
Total number of unemployed persons	0.444606	0.182747	-0.106801
No. of unemployed persons per 1,000 capita	0.461494	.171127	-0.131923
Average wages in euros	-0.094546	-0.035174	0.071629

Source: Author's calculation on the basis of Table 1

inflows and decrease in the number of employees. This can be explained by the fact that foreign investors, who invested their capital in Serbia through privatisation, first laid off a number of employees. FDI did not produce any significant impacts on the other indicators of economic development in the investment year.

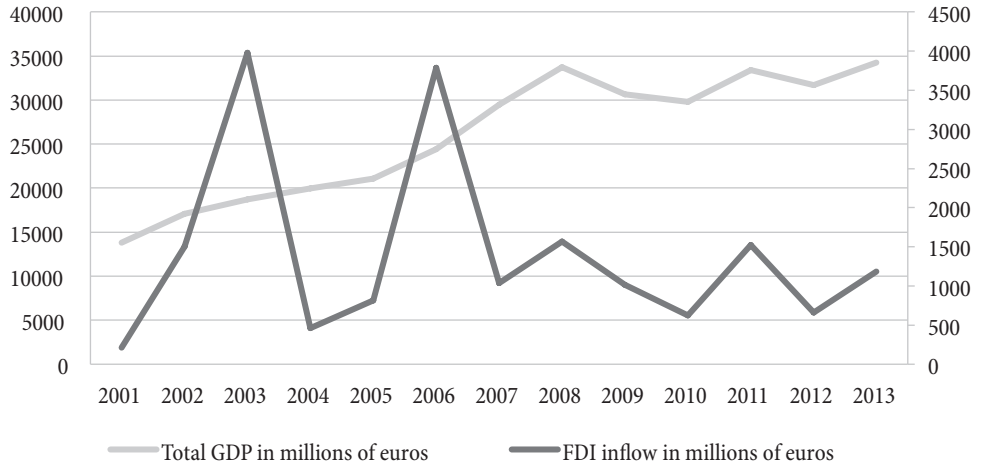
When observing the results of the analysis with a one-year time lag, one comes to somewhat different conclusions. FDI are linked through a weak linear correlation with the population, real GDP growth and indicators related to the number of employees. Since these correlation coefficients are of extremely low value (ranging from 0.2 to 0.39), and since the coefficients of other indicators are of extremely low value as well, it can be concluded that FDI did not have a significant impact on the economic development of Serbia, not even after one year after the investment.

Perhaps the most important of all is the correlation analysis with a two-year time lag, when it is assumed that FDI should have an impact on the host economy. Again, most of the indicators exhibited no significant correlation coefficient; however, several important indicators did show a correlation with the FDI inflow. First of all, the number of employees per 1,000 capita, whose correlation coefficient is 0.48, which practically means that there is a relatively weak direct linear correlation between this indicator and FDI inflow. In other words, the increase in the number of employees in Serbia can be explained to some extent by the FDI inflow, two years after the initial investment. It is interesting that this indicator in the analysis without a time lag was of extremely low value; hence the number of employees could not be linked to the investment inflow.

A somewhat weaker linear correlation of moderate strength was registered for the real GDP growth, as well as for the total number of employees and the number of employees in wholesale and retail trade. What is especially interesting is the drastic change of the correlation coefficient for the number of employees in wholesale and retail trade, which moved from a negative value in the analysis without a time lag to the value of 0.46 in the analysis with a two-year time lag. This leads to the conclusion that foreign investments only slightly reduced the number of employees in trade in the first year, while two years later they stimulated increase in the number of employees in this sector. Accordingly, it can be concluded that two years after their arrival, FDI moderately affected the increase in the number of employees, especially in the trade sector, as well as the real GDP growth. On the other hand, annual changes in FDI inflows had no effect on the trends of the following indicators: the average population; GDP; GDP per capita; the number of employed persons in the manufacturing industry; the number of unemployed persons; the number of unemployed persons per 1,000 capita, and the average wage.

Bearing in mind that most indicators recorded low values of the correlation coefficients, and that only a few indicators recorded correlation coefficients of moderate strength, it cannot be argued that there is a correlation between FDI inflow and indicators of economic development

Figure 1: Serbian GDP and FDI inflow for the period from 2001 to 2013



Source: Table 1

of Serbia in the observed period. It can be concluded that FDI had no significant impact on the economic development of Serbia in the period between 2001 and 2013.

Discussion of the results

The results of the correlation analysis unambiguously confirmed the thesis that FDI did not significantly contribute to the economic development of Serbia. In the observed period, the population in Serbia decreased by 337 thousand, and the total number of employees decreased as well. Production dropped; hence the number of employees in the manufacturing industry was reduced by half. During this time, the unemployment rate was increasing, while only the trade sector recorded an increase. The fact that the trade sector flourished is exclusively the result of increased imports in the observed period, which was not accompanied by a proportional increase in exports. Without a sufficient amount of export-oriented FDI, it could not be expected that they will contribute significantly to the economy of Serbia. The analysis showed that FDI inflows had no statistically significant correlations with the trends of GDP, reduction of the number of unemployed persons and wage growth, as the main indicators of economic development of a country.

The main question now arising is: Why there have been no spillover effects of FDI when it is known that the non-financial sector alone in the observed thirteen-year long period received over 19 billion euros of foreign capital? The answer to this question could be sought both in the structure and form of FDI that came to Serbia, and in the policy of attracting FDI which Serbia implemented in the observed period.

By examining the list of the twenty largest non-financial FDI, one notices that privatisations, as a form of foreign investment, prevail. Twenty largest FDI brought 12.3 billion euros into the Serbian economy, out of which 14 were in the form of privatisation with a total value of 8.8 billion euros. On the same list, there is one brown-field investment, which actually is the privatisation of Apatinska pivara (Apatin Brewery) by the Belgian company Anheuser-Bush InBev NV. The total value of privatisations

Table 3: 20 largest non-financial FDI in Serbia (2001-2013)

Rank	Company	Year	Form of FDI	Sector	Country	Value in EUR
1	Telenor	2006	privatisation	Telecommunications	Norway	1,898,000,000
2	Delhaize	2011	green-field	Retail	Belgium	1,028,000,000
3	Kohlberg Kravis Roberts (KKR)	2013	privatisation	Telecommunications	United States	1,000,000,000
4	Gazprom Neft / NIS Novi Sad	2009	privatisation	Oil & Gas	Russia	947,000,000
5	Fiat Group Automobiles	2008	privatisation	Automotive industry	Italy	940,000,000
6	Telekom Austria Group / VIP Mobile	2006	green-field	Telecommunications	Austria	827,000,000
7	Philip Morris	2003	privatisation	Tobacco	United States	733,000,000
8	Stada - Hemofarm	2006	privatisation	Pharmaceutical	Germany	650,000,000
9	Agrokor	2003	privatisation	Food & Beverage, Agriculture	Croatia	614,000,000
10	Salford Capital Partners	2003	privatisation	Food & Beverage, Agriculture	United Kingdom	500,000,000
11	Merkator	2002	green-field	Retail	Slovenia	500,000,000
12	Molson Coors (Apatinska pivara)	2003	privatisation	Food & Beverage, Agriculture	United States	487,000,000
13	BIG CEE	2009	green-field	Real Estate	Israel	470,000,000
14	Anheuser-Bush InBev NV	2003	brown-field	Food & Beverage, Agriculture	Belgium	430,000,000
15	UnipolSai / DDOR Novi Sad	2008	privatisation	Insurance & Pension	Italy	262,000,000
16	BIG TIGAR	2011	green-field	Automotive industry	France	215,000,000
17	LUKOIL	2003	privatisation	Oil & Gas	Russia	210,000,000
18	PepsiCo / Marbo Product	2008	privatisation	Food & Beverage, Agriculture	United States	200,000,000
19	British American Tobacco	2003	privatisation	Tobacco	United Kingdom	200,000,000
20	Carlsberg Breweries A/S	2003	privatisation	Food & Beverage, Agriculture	Denmark	175,000,000
Total						12,286,000,000

Source: Author's calculation based on [16]

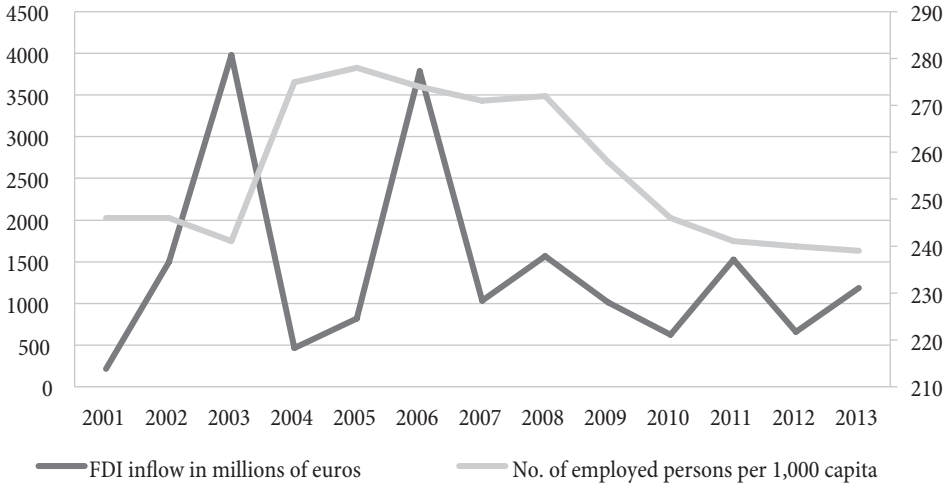
is almost 9.3 billion euros only for the first twenty non-financial FDI in Serbia. According to the NALED's data, a total amount of around 13 billion euros of FDI came to Serbia through privatisations in the 2001–2013 period in the non-financial sector alone. Specifically, observing the total FDI inflow in Serbia, two thirds came in the form of privatisations.[2]

Observed from the perspective of the economy of a host country, privatisation as a form of FDI is certainly the least desirable form of capital inflow. Privatisations almost as a rule imply a layoff, hence the spillover effects in that case are questionable, especially when the overall employment is observed. By examining the list of the largest FDI, it is clearly visible that these privatisations in most cases referred to the tobacco industry, breweries, cement plants, etc. In addition to the negative impact on employment, the majority of raw materials needed for the production financed by the FDI were imported from abroad, hence the spillover effect could not exist inside the supply chain. When it comes to intrasectoral technology and knowledge spillover, it did not happen either, since there was practically no domestic competition. The largest number of large-capacity factories ended up in the hands of transnational companies in the first years of the transition process in Serbia.

The entire policy of attracting FDI to Serbia was created with the aim of creating new jobs, but it turned out that FDI did not have a significant impact on the employment growth and decrease in the unemployment rate. The policy to attract FDI has been institutionally implemented only since 2006, and has been reduced to mere financial and fiscal support to foreign investors. This meant that foreign investors were given land free of charge, the government invested in infrastructure, and the investor was exempted from taxes and contributions for employees. In addition, since 2010, subsidies have been granted for newly employed workers, and hence some foreign investors were able to generate up to ten thousand euros per new workplace, depending on the sector and area of investment. In practice, a contract was concluded between a foreign investor and the state, which was effective for a number of years, with the possibility of an extension, which obliged the investor to pay minimum wages to the subsidised workers. By submitting a bank guarantee, the investor undertook not to sell the land that the government conceded free of charge, as well as to employ a certain number of workers over a period of several years. However, it turned out that a bank guarantee is an insufficient tool for preventing misuse of financial support to investors, since many companies gave guarantees of insolvent banks that soon after become void. Also, the state allowed many bank guarantees to expire or not to be activated, regardless of the fact that foreign investors did not fulfill the terms of the contract. On the other hand,

2 Author's calculations based on data received from: the National Aliance for Local Economic Development (NALED), the Internet:http://www.naled-serbia.org/investments/index/Baza+investicija, retrieved on: March 15th 2016.

Figure 2: Number of employed persons per 1,000 capita and FDI inflow in Serbia for the period from 2001 to 2013



Source: Table 1

information on total government investments in projects of subsidising foreign investors are not publicly available, and therefore researchers are left to speculate about how much Serbia really gave to foreign investors. In addition, due to the absence of regulations on companies' mandatory reporting on the amount of current investments, data on FDI inflow should be taken only as indicative, not as official. It can be concluded that the policy to attract FDI was conducted in a non-transparent manner, which opened the possibility for numerous corruptive activities on one hand, and discrimination against domestic investors on the other.

In an attempt to connect this research with the previous ones, which dealt with the impact of FDI on the economy of the host country, it can be said that the author sides with those authors who did not find evidence of the spillover effects. Thus, the author agrees with the authors who claim that there is no causal relation between FDI inflow and economic development of the host country. In this respect, this research adds another element to this argument. The author believes that the success of spillover effects depends on the form of FDI. In other words, privatisation as a form of FDI cannot produce spillover effects to the extent that green-field investments can, which implies investing in a brand new company and creating opportunities for new jobs. Also, the author believes that much depends on the policy that a state implements to attract FDI. If this policy is implemented non-transparently and by favouring foreign investors over domestic ones, there will hardly be any spillover effects on domestic companies, because they are automatically placed at a disadvantage.

Conclusion

The theoretical assumption that FDI stimulate the economic development of the host country was empirically tested in the case study of Serbia. Serbia is the ideal framework for this research, since it is a country that attracted significant foreign capital in the observed period and completely changed its economic policy, aligning it with the liberal demands of the European and world markets. In addition, Serbia invested effort and capital in attracting FDI in the observed period, by non-transparently providing subsidies to foreign investors.

The initial hypothesis was that there was no necessary causality between FDI and local economic development, meaning that FDI will not, by their mere presence, always and everywhere, cause technology and knowledge spillover effects. The author was able to prove this by way of correlation analysis at the level of the Republic of Serbia. The obtained values of the correlation coefficients between FDI inflow in Serbia and indicators of economic development clearly show that there is no significant linear correlation between these two trends. This practically means that not only that FDI did not stimulate the economic development of Serbia in the observed period, but also that they have no significant common points with the basic macroeconomic indicators.

The answer to the question of why foreign investments have not contributed to the economic development of Serbia could be found in the fact that the majority of foreign capital came in the form of privatisation. The main motive of foreign investors was to gain access to the Serbian market through privatisation under favourable conditions. These privatisations, as a rule, involved layoffs, and their products have been placed mainly in the domestic market.

The author has concerns about the fact that the state does not possess accurate information on the value of the total FDI, or on the value of the subsidies in the observed period. In addition, information on amounts that foreign investors actually invested in Serbia remains in the hands of the investors.

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REVIEW PAPER
UDK: 005.336.5:004
007:658]:004
DOI:10.5937/EKOPRE1706393Z
Date of Receipt: May 20, 2017

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THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN ENTERPRISES IN SERBIA

Primena informaciono-komunikacionih tehnologija u preduzećima u Srbiji

Abstract

In this paper, we analyse the usage of information and communication technologies (ICT) in enterprises in Serbia. The analysis is based on the data generated from the statistical survey of the Statistical Office of the Republic of Serbia for 2016 (ICT Usage – Enterprises) and on the Eurostat data on the usage of ICT in enterprises in the EU Member States (EU-28). We observed the following indicators of the usage of ICT: fixed broadband access, speed of Internet connections, employment of ICT specialists, Internet presence (enterprises having a website), use of social media, use of cloud computing services, enterprises engaged in e-commerce (percentage of enterprises and share of online sales in total turnover). Based on these indicators, the comparison with the EU Member States has been made. It has been found that the accomplished level of the usage of ICT in enterprises in the Republic of Serbia is above the European average, yet still below the level of the developed EU economies. When cloud computing services and the development of web-based sales are considered, Serbia still lags behind the EU Member States.

Keywords: *information and communication technologies, cloud computing, e-commerce, enterprises, Serbia*

Sažetak

U radu je analizirana primena informaciono-komunikacionih tehnologija (IKT) u preduzećima u Srbiji. Analiza je zasnovana na podacima Republičkog zavoda za statistiku za 2016. godinu koji se dobijaju statističkim istraživanjem „Upotreba informaciono-komunikacionih tehnologija u privrednim društvima" i na podacima Eurostat-a o primeni IKT u preduzećima u zemljama članicama Evropske unije (EU-28). Posmatrani su sledeći indikatori upotrebe IKT: širokopojasna internet konekcija, brzina internet konekcije, zapošljavanje IKT stručnjaka, prisustvo na internetu (posedovanje vebsajta), korišćenje društvenih medija, korišćenje usluga cloud računarstva, pokazatelji elektronske trgovine (procenat preduzeća koja učestvuju u elektronskoj trgovini i učešće e-trgovine u ostvarenom prometu). Na osnovu ovih indikatora, izvršeno je poređenje sa zemljama Evropske unije. Ocenjeno je da je dostignut nivo u primeni IKT u preduzećima u Srbiji iznad evropskog proseka, mada još uvek ne na nivou razvijenih evropskih ekonomija, naročito kada je u pitanju korišćenje usluga cloud računarstva i razvoj elektronske trgovine, u kojima Srbija još uvek zaostaje za evropskim zemljama.

Ključne reči: *informaciono-komunikacione tehnologije, cloud računarstvo, e-trgovina, preduzeća, Srbija*

Introduction

Every year since 2006, the Statistical Office of the Republic of Serbia has been conducting a survey on the usage of information and communication technologies (ICT) in enterprises in Serbia. In this survey, data are collected from companies across Serbia on the application of ICT in enterprises, on the use of computers, Internet usage, characteristics of the information system in enterprises and electronic business of the company. The title of the survey is ICT Usage – Enterprises and the research results have been published every year in Statistical Releases, The Statistical Yearbook of the Republic of Serbia, in the chapter named Information Technologies, and on the website of the Statistical Office. Also, in 2015 and 2016, the Statistical Office published two separate publications named Usage of Information and Communication Technologies in the Republic of Serbia in which research results have been presented in detail.

However, despite the fact that the results of the research are published regularly and that in the past ten years of conducting this research a solid information base has been established, the obtained data have not been analysed in detail by the scientific and professional public so far. The data have not been observed in a wider context yet, such as, for example, the achieved level of ICT application in enterprises, ICT development in enterprises over the years, the degree of acceptance of new information technologies, directions for future development, and the like.

Such analyses are largely done for developed market economies, in which statistics on information society has been developing for more than a decade. Statistics on information society is the field of official statistics that deals with the collection of data on the access and use of ICT in households/among individuals and in enterprises. In the European Union, the statistics on information society has been developing since 2004, and Eurostat collects and publishes data on the application of ICT in enterprises within the section Digital Economy and Society [6]. The statistics on information society is complex and includes the collection of data on the production, application and effects of ICT on economy and society. Based on the collected official data, the literature analyses the results of ICT applications in developed market economies, the effects of ICT on the competitiveness and productivity of enterprises [2], [3] and effects on overall economic performance [12]. In Serbia, the preliminary assessment of the achieved level of development in the application of ICT would be the first step in the direction of such analyses. Two important aspects to be observed have been set: the analysis of the achieved level of development in the application of ICT in enterprises and comparison with the EU countries.

So far, the level of the development of ICT in Serbia has been addressed by the Information Society Development Strategy in the Republic of Serbia until year 2020, adopted by the Government of the Republic of Serbia in 2010. The strategy analyses the application and development of ICT in Serbia in terms of defining the basic goals, principles and priorities in the development of the information society. In scientific papers, the achieved level of ICT development in Serbia was analysed in [14] based on the composite index called the Networked Readiness Index (NRI) defined by the World Bank. In this index, the application of ICT in enterprises is taken into account through the indicators defined by the World Bank regarding the application of the Internet in business operations and the indicators of the possibilities of firm-level technology absorption. In [21], the impact of ICT on productivity and competitiveness of enterprises in Serbia was examined through the analysis of one segment of Serbian industry (print media industry). Similarly, using the case study method, the impact of ICT on the company's performance in telecommunications, education, manufacturing, financial and insurance activities and retail trade is analysed in [1], while another study [11] points to the importance of ICT for improving the business of companies and travel agencies in the field of accommodation and food service.

Therefore, it could be said that the number of scientific papers on the application of ICT in Serbian enterprises is disproportionately small in relation to the importance of the topic. In addition, the authors have not dealt with the official data and indicators of the Statistical Office of the Republic of Serbia for the entire economy. The aim of this paper is to fill this gap and to estimate the achieved level of application of information and communication technologies in companies in Serbia based on the available data of the Statistical Office of the Republic of Serbia.

For this purpose, the most important indicators of the usage of ICT, collected and published by the Statistical Office of the Republic of Serbia, will be analysed. These indicators are: fixed broadband access, employment of ICT specialists, speed of Internet connections, Internet presence and use of social media, use of cloud computing, enterprises engaged in e-commerce. The significance of these indicators stems from the importance Eurostat attributes to them in its analyses. Eurostat statistics on the information society collects data on a large number of indicators, but those mentioned here are the most important ones for the analysis of the usage of ICT in enterprises in the countries of the European Union [16].

After the introduction, in the second part of the paper, the basic terms of the methodology of the Statistical Office of the Republic of Serbia regarding data collection in the field of ICT applications in enterprises are presented. In the third part of the paper, we present the values of indicators in Serbia and a comparison with the values of those indicators in the European Union. Fourth part of the paper gives the expected directions in the application of ICT in enterprises in Serbia and points out the effects of ICT that can be expected in the future. In conclusion, the achieved level of ICT application in enterprises in Serbia is evaluated and the need for further research in this field is presented.

Methodology and data sources

The statistical survey titled ICT Usage – Enterprises has been carried out by the Statistical Office of the Republic of Serbia regularly since 2006. The aim of the survey is to provide data on the usage of information and communication technologies by enterprises in the Republic of Serbia. The survey is conducted according to the Eurostat methodology. Initially, in the early years, the research involved 600 enterprises. Data have been collected on using computers in business ("Does your company use computers in business?"), information technology (wire-based LAN, intranet, wireless LAN, extranet), Internet access, the possession of a website and the use of electronic services of public administration. [16]. Over time, new questions have been added to the research, such as questions about using Enterprise Resource Planning – ERP system, Customer Relationship Management (CRM) and types of services provided on the website [17]. Since 2015, the research has been further expanded and is now based on a comprehensive questionnaire in which questions are grouped according to the following modules [18]:

- Use of Computers;
- ICT Specialists and Skills;
- Access to and Use of the Internet;
- Use of Cloud Computing Services;
- Big Data Analytics;
- Electronic Invoicing;
- E-Commerce.

Based on the questionnaire, a large number of data is collected within the appropriate modules. For example, within the module "Access to and Use of the Internet", a number of indicators is defined in relation to the use of fixed broadband connection to the Internet for business purposes, use of mobile connection to the Internet, use of a website and social media, public authorities' Internet services and automatic exchange of information between different functions of the enterprise. The research is fully in line with the Eurostat methodology and the indicators obtained are comparable with the indicators for the countries of the European Union.

In accordance with the methodology of Eurostat, the survey covered companies with 10 or more employees, dealing with the following activities: manufacturing, construction, wholesale and retail trade, repair of motor vehicles, hotels, camps and other accommodation for short stays, transport, storage and communications, real estate activities, renting and business activities, cinematographic and video shooting activities, radio and TV activities, as well as the financial sector (banks and insurance companies). Companies in the survey are ranked by size to small (10-49 employees), medium (50-249) and large (more than 250 employees). In 2015, the survey covered 1,361, and in 2016 as many as 1,673 companies in the Republic of Serbia. Starting from 1999, the Statistical Office of the Republic of Serbia has not collected data for the AP Kosovo and Metohija, which is why it is not included in the data for the Republic of Serbia.

The results of the research are published in the publications of the Statistical Office and are also available

on the website of the Statistical Office in the electronic database. However, the Statistical Office's database is not fully updated and contains only a small number of indicators on the use of computers and the Internet in enterprises, by company size [7].

In addition to the data from the Statistical Office of the Republic of Serbia, Eurostat data from the field of digital economy and society were also used in this paper. These data are available in the Eurostat publications and on the Eurostat website, as well as in the Eurostat database [5]. For most indicators, data in the Eurostat database are available starting from 2009 onwards.

ICT application in Serbian companies – main findings and comparison with the EU

In 2016, 99.8% of enterprises used a computer in their operations in the Republic of Serbia. The same percentage of enterprises, 99.8%, has an Internet connection, so practically all companies in Serbia use the Internet. Also, 99% of enterprises in Serbia have broadband Internet connection. As explained in [19], broadband Internet connection not only allows faster access to the Internet, but also changes the overall way of using the Internet, since it enables the download of information from the Internet much faster than the traditional dial-up modem connection, which is why this is one of the basic indicators of the development of ICT use in the European Union since 2005.

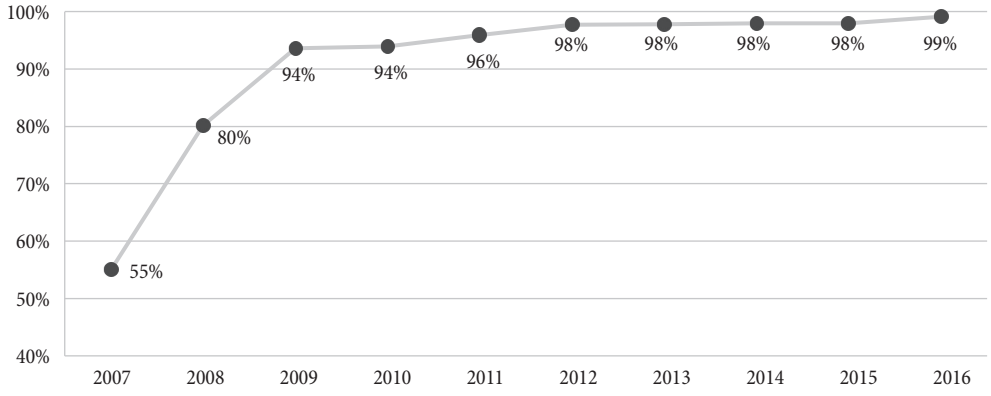
In 2016, 92% of enterprises in the EU-28 countries used fixed broadband connection to access the Internet, while in Serbia this percentage has been above 95% since 2011 (see Figure 1). Therefore, companies in Serbia are able to use all the advantages of the fast Internet, including faster accessibility to information, downloading of various Internet content, possibility of communication among employees, possibility of communication with external persons, e-business and more.

In 2016, ICT experts in Serbia have been employed in 22% of enterprises, while the average for the EU-28 is one fifth or 20% of enterprises. As much as 30% of companies in Serbia have declared that they had vacancies for ICT specialists that were difficult to fill. Companies in EU countries, however, do not have such problems, so, in 2016, only 5% of companies reported that they had difficulties in filling vacancies for ICT professionals.

The next significant indicator is the speed of Internet connection. In 2016, approximately 28 % of enterprises in the EU-28 had Internet connection speed that was within the range of ≥ 2 Mb/s but < 10 Mb/s, with a similar but slightly smaller share (26 %) having a connection that was in the range of ≥ 10 Mb/s but < 30 Mb/s. Approximately one fifth (19 %) had a connection in the range of ≥ 30 Mb/s but < 100 Mb/s. In Serbia, the share of enterprises that had Internet connection speed within the range of ≥ 2 Mb/s but < 10 Mb/s was 35%, 42% of them were in the range of ≥ 10 Mb/s but < 30 Mb/s, while the speed of 17% of enterprises was in the range of ≥ 30 Mb/s but < 100 Mb/s.

The percentage of enterprises with the Internet connection speed of less than 2 Mb/s is low in both Serbia and the EU, while the percentage of companies with Internet connection speed greater than 100Mb/s is significantly higher in the EU than in Serbia (13% compared to 5%).

Figure 1: Broadband Internet connection in enterprises in Serbia 2007-2016 (% of enterprises)



Source: Statistical Office of the Republic of Serbia

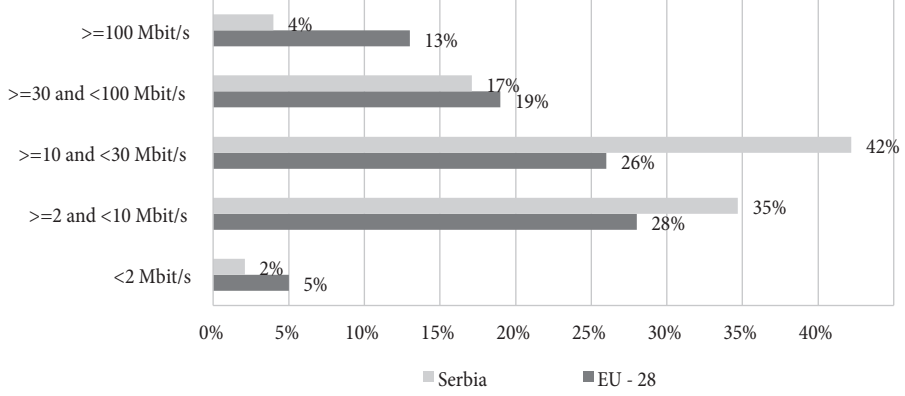
Figure 2 (see below) facilitates the comparison. It can be concluded that in terms of Internet connection speed, companies in Serbia have still not reached the level of the European Union. The reason for this is the fact that the speed of Internet connection depends primarily on the availability of transmission technology or the available infrastructure, which in Serbia is still not at a satisfactory level. However, given the differences that exist in terms of the level of infrastructure development in Serbia and the countries of the European Union, it can be said that this gap is not too large.

In 2016, more than three fourths of the EU-28 companies, or 77%, had their own website. In Serbia, 81% of companies have their own website. In this respect, Serbia left the newer EU member states behind, such as Croatia (69%), Romania (42%), Bulgaria (51%) and even France (68%), Hungary (68%), Greece (66%), and it is approaching the Scandinavian countries such as Sweden (90%), Finland (95%) and developed European countries like Germany (89%). A high percentage of companies that own a website say that companies in Serbia pay great attention to their visibility on the Internet, in which they find their business opportunity and the opportunity to advertise on the domestic and foreign markets. The website is owned by almost all large companies – 94%, while the percentage of medium-sized and small companies that have a website is somewhat smaller, accounting for 90% of medium-sized and 78% of small businesses.

Most often, enterprises in Serbia use their websites to display the description of goods or services and the price lists (87%), personalised content in the website for regular visitors (84%), possibility for visitors to customise or design online goods or services (70%), links to the enterprise's social media profiles (42%) and online ordering or reservation (23%). In terms of online reservation or ordering of products, the main activities are accommodation and food services where 69% of companies use the website for ordering or reservation (for example, travel agencies). The following are wholesale and retail trade (37% of enterprises) and information and communication (32% of enterprises). There is another, new type of service offered on the website, adjusted to customers, which is chat with users, allowing real-time communication, but it is not yet covered by the survey.

As regards the use of social media, 45% of EU companies use some of the social media, while in Serbia this percentage is 36%. Differences in the use of social media between the EU countries are large and range from countries where more than 50% of companies use social media (the Netherlands, Belgium, Scandinavian countries), to those in which this participation is below 30% (the Czech Republic, Slovakia, Romania, Poland, Lithuania). In Serbia, as in most EU countries, the most popular form of social media are social networks. In Serbia, 36% of companies use social networks in their business (Facebook, LinkedIn, XING, Yammer), 15% use multimedia-content-sharing sites, such as YouTube, Flickr, Picasso, and 13% use blog/Twitter. The share of enterprises using Wiki-based knowledge-sharing tools is 8%. Regarding comparison with the EU-28, see Figure 3 below. In terms of the use of social networks, the main activities are accommodation and food services (67% of enterprises), information and

Figure 2: Internet connection speed in enterprises in Serbia and EU-28, 2016 (% of enterprises)



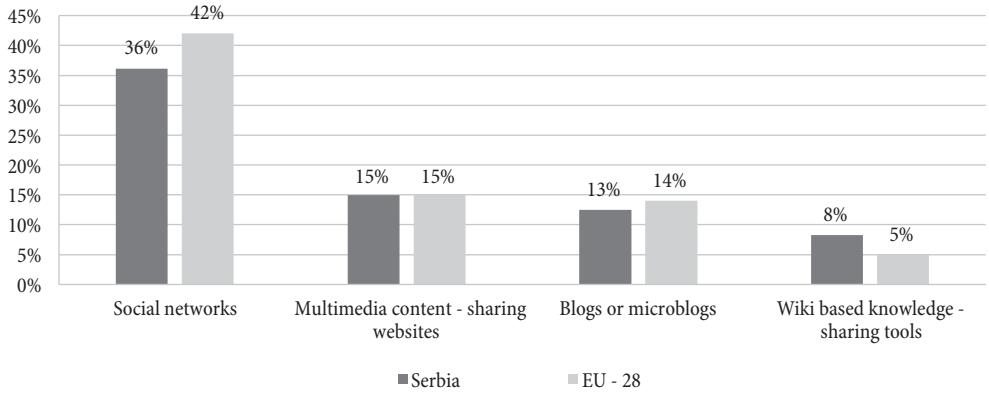
Source: Statistical Office of the Republic of Serbia, Eurostat

communication (66%), wholesale and retail trade (43%), administrative and support service activities (50%) and real estate activities (37%). Although official data on the use of social networks are not available yet, it is widely known that social networks are mostly used for free product advertising, communication with potential customers, and often for ordering products (Facebook), as well as for various notifications (Twitter). The particular advantage of social networks is the possibility of communication, to which both companies and customers attach great importance. The truth is this communication does not take place in real time, but it is easy for buyers and cheap for businesses, because there are no costs of creating and maintaining a website and renting a domain.

The use of cloud computing is another important indicator of the application of ICT in enterprises. This indicator has lately been given a lot of attention in analyses because cloud computing has become synonymous with new information technologies. Cloud computing is a combination of hardware, software, expertise and online services, which, among other things, includes computers that are networked under the same network operating system, have the flexibility to change resources and can allocate these resources to both simple and complex applications [15]. Cloud computing services for enterprises include various ICT services that are accessed via the Internet: e-mail, storage of files, hosting for the enterprise database, use of office software, use of financial or accounting software applications, use of CRM software, computer power to run the enterprise's own software. In the EU-28, in 2016, cloud computing services were used by 21% of enterprises, mostly large enterprises (45%), medium-sized enterprises (29%) and small enterprises (19%). In Serbia, this percentage is much lower. Only 9% of companies use cloud computing services: 13% of large enterprises, 9% of medium-sized and 9% of small businesses. Regarding the use of cloud computing services in the EU, Nordic countries are in the lead (over 40% of enterprises), while in Greece, Lithuania, Poland, Bulgaria and Romania, this percentage is below 10%. Figure 4 below shows the types of cloud computing services that were used in Serbia and the European Union in 2016. Based on these data, it can be seen that companies in Serbia are more reliant on cloud platform in order to upgrade their own capacities, whether it is hosting a database or using software, while the two most common uses of cloud computing services in the EU-28 were e-mail hosting and storing files in electronic form.

The term "electronic commerce" (electronic commerce or e-commerce) refers to the purchase and sale of goods and services over the Internet. It is a set of commercial activities that are conducted through electronic networks (most often over the Internet) and whose ultimate goal is selling or purchasing products or services [15, p. 139]. This term should be distinguished from the term e-business, which is of a newer date and means generally doing business over the Internet. In accordance with the Eurostat methodology, the term e-sales concerns the receipt of orders by methods specifically designed for the purpose of receiving orders, either via electronic data interchange (EDI) or through websites or apps (orders received by way of hand-typed e-mail messages are not included).

Figure 3: Enterprises using social media, by type of social media, Serbia and EU-28, 2016 (% of enterprises)



Source: Statistical Office of the Republic of Serbia, Eurostat

The data show that the share of enterprises in the EU-28 performing e-sales was 20% in 2015, while in Serbia this percentage was 23% (this is the latest available data, data for 2016 have not yet been published). However, the share of enterprises is not the only important indicator. Even more important is the participation of such turnover in the total turnover of enterprises. For Serbia, this percentage is still low and in 2014 it amounted to only 6% (source: Eurostat database, also the latest data available), while the average at the EU-28 level in 2014 was 15% of the total turnover.

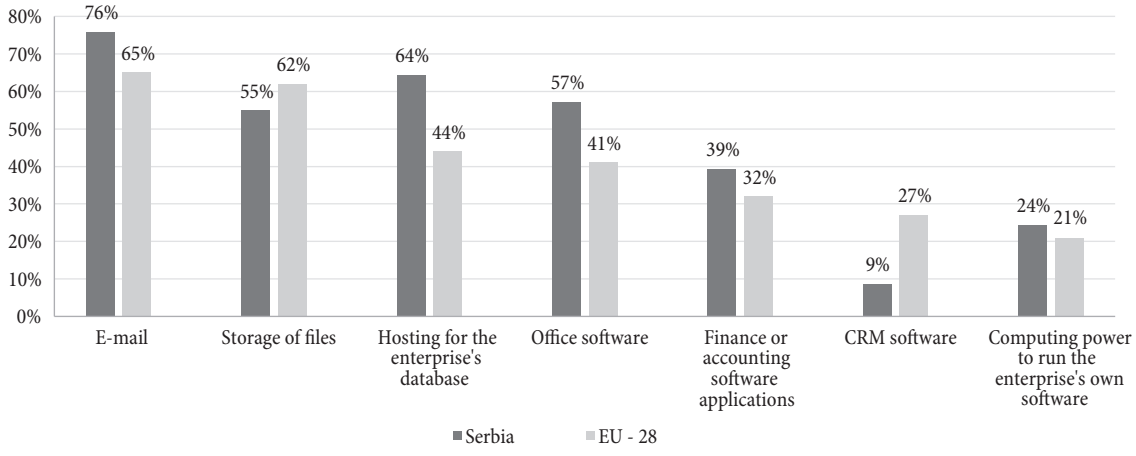
Companies in Serbia generally receive orders for their products through a website or mobile applications, while the share of companies receiving orders via EDI is low and amounts to only 1%. Companies themselves order goods over the Internet more than they sell their own products, so 41% of companies in Serbia order products and services for the needs of their own production or simply for the consumption in the company.

Finally, Table 1 summarises the observed indicators for Serbia and the EU-28.

Directions for future development and expected effects

When analysing the data in Table 1, it can be seen that companies in Serbia are lagging behind the European Union mostly in the use of cloud computing and e-commerce development. The greatest advantage of cloud computing is of financial nature. Based on Eurostat data presented and commented in [10, p. 108], the use of cloud computing services in the EU countries has reduced the costs of building ICT infrastructure from 23% (Croatia), up to as much as 82% (Slovakia). In addition to financial aspects, cloud computing has many other advantages: the use of cloud computing is the use of technology that, and when necessary, does not have to be installed on computers. Also, a person is paying exactly the technology they are using [13, p. 2]. This is an important issue when choosing a model for building ICT infrastructure. "Pay what you use" is a model that represents cloud computing and it is certainly cheaper for the company than the model "Pay

Figure 4: Enterprises using cloud computing services, by purpose, Serbia and EU-28, 2016 (% of enterprises)



Source: Statistical Office of the Republic of Serbia, Eurostat

Table 1: ICT usage indicators in enterprises in Serbia and EU-28, 2016 (% of enterprises)

ICT usage indicator	Serbia	EU - 28
Broadband internet connection	99%	92%
Enterprises employed ICT specialists	22%	20%
Enterprises having a website	81%	77%
Enterprises using social networks	36%	42%
Enterprises using cloud computing services	9%	21%
Enterprises making e-sales[1]	23%	20%
Share of web sales in total turnover[2]	6%	15%

[1] Data for 2015 – the latest available data
[2] Data for 2014 – the latest available data
Source: Statistical Office of the Republic of Serbia, Eurostat

for everything in advance", because, in terms of costs, payment in advance is the primary financial problem with internally based ICT infrastructures.

The most famous companies offering cloud computing services are IMB, Google, Microsoft and Amazon. Cloud services in Serbia are offered by Telekom, followed by EUnet, as well as Coming - Computer Engineering and Net ++. These companies offer different types of cloud services and many customised packages for users/companies. However, the limiting factor for using these services is their price. Cloud services are not cheap, but they are nevertheless particularly attractive to small and medium-sized enterprises that cannot afford big initial investments in IT equipment. These companies are the most interesting target group for cloud service providers. Telekom is pleading that, as far as the sale of cloud services is concerned, "traditionally business users, primarily small and medium enterprises, are targeted. For such enterprises, it is important that they do not have large initial investments, that they can have support 24/7 and that they can economically use the computer infrastructure they would not be able to provide themselves if they carried out the project independently. Then, there are public companies and government agencies that can provide services in a safe and economical way through cloud infrastructure. According to some studies, while raising the level of automation of business processes, and therefore the competitiveness and profitability of companies, the introduction of cloud services into public companies, health, education and public administration would bring Serbia substantial investment and operational costs that can be measured in hundreds of millions of euros a year" [9].

Regarding the development of e-commerce in Serbia, the share of companies receiving orders over the Internet in Serbia is 23%, which is above the percentage in, for example, Lithuania, Bulgaria and Romania, where it does not exceed 10% and almost at the level of developed European countries: Belgium, Sweden, Denmark or Germany, where it ranges between 25% and 30%. In terms of the achieved turnover via e-commerce, Serbia, however, lags substantially behind the EU, although it is possible that by 2017 the turnover will increase compared to the one shown in Table 1, where the data for 2014 are given. As the most important problems in the development of e-commerce, companies in Serbia indicated "problems related to logistics (delivery of goods or delivery of services)", which accounted for 42% of enterprises and "the costs of introducing web sales", which accounted for 36% of enterprises, while other obstacles, such as the legislative framework or security issues, are of minor importance [19]. Even "problems related to payment" are not as important for businesses as might have been expected for Serbia, since only 2.7% of enterprises report this problem.

In addition to logistics infrastructure, which is, as is commonly known, underdeveloped in Serbia, the companies have not unjustifiedly indicated the "costs of introducing web-based sales" as a significant limiting factor for the development of electronic commerce. The most important precondition for the development of electronic commerce is for an enterprise to have an interactive website that offers the entire sales structure with visible prices, products, consumer basket and ordering systems. Having a website, however, is not cheap for Serbian companies. According to the authors' research, in the Republic of Serbia, the creation of the most basic website (static, 5 pages maximum) costs 50 euros, the creation of an average website with a gallery, a contact form (up to 10 pages) costs 150 euros, while the creation of the most complex website with the development of web software and the possibility of manipulating the contents of the site costs € 600 or more. The cost of maintaining a website depends on several factors, above all on the complexity of the website, and is additionally charged. There is a special charge for domain registration and/or a hosting package. Web hosting represents providing space on the hard disk of a server that is deliberately configured to display different Internet content provided by the hosting provider. Through an administrative approach, with a hosting package, it is possible to add domains and subdomains, create your own e-mail addresses, create databases, etc. The price of the domain and hosting package is about 4,000 dinars per year, depending on the provider [8].

It is therefore clear what "bothers" companies in Serbia when it comes to the introduction and development of electronic commerce. Thus, those problems could serve as recommendations for incentives and new goals of some next ICT Development Strategy for Serbia. Once these barriers are overcome, one can expect the well-

known effects of introducing e-commerce: lower costs for businesses and drop of consumer prices have already been recorded in countries with longer experience in e-commerce development (USA, UK, European countries) [12, p. 251]. The development of e-commerce can also produce other desirable effects in Serbia, such as export growth and entry into the European market.

Conclusion

Looking at the selected indicators and comparing the data from the European Union, one can conclude that companies in Serbia understood the importance of modern information and communication technologies for their business on time. In 2016, more than 99% of businesses used computers and the Internet in their operations. Enterprises are adopting new information technologies, employing ICT professionals, using cloud computing services and introducing electronic commerce. As regards the observed indicators, in terms of the use of the Internet, the employment of ICT specialists and the possession of a website, Serbia is above the EU-28 average. In terms of e-commerce, Serbia lags behind the EU average, and the same applies to the use of cloud computing services. There is still plenty of room for using social media and improving communication with consumers through social networks in relation to the average of the European Union and most European countries. However, given the importance recently attached to social networks, it can be expected that Serbia will soon reach this average and even exceed it.

However, when making a comparison, one should be cautious because the values of the indicators vary from country to country, depending on the differences, on a national level, in the size and structure of enterprises, industrial specialisations, level of development of ICT infrastructure, and even the level of development and the style of consumer culture to which businesses are adapting. The average values of indicators that are lower for the EU than for Serbia are the consequence of lower values for countries such as Romania, Bulgaria, Lithuania, Estonia, Poland, where ICT infrastructure is still not at the level of the one in Germany, Austria, France, the Netherlands, Belgium or the Scandinavian countries. Therefore, the achieved level of ICT usage in enterprises in Serbia could be assessed as: above the European average, but not at the level of the developed European economies. Serbia trying to compare itself with the developed European economies, despite the differences in IT infrastructure and the achieved level of development, should not be considered too ambitious. There is no reason for Serbia not to be at the level of these countries, because there are also small European economies (Iceland, Malta, etc.) that achieved remarkable results thanks to significant investments in this field.

When the data from [19] are analysed in detail, significant differences in the application of ICT can be seen, depending on the size of the company. It can be concluded that the size of the company and the prices of ICT limit the use of ICT in companies in Serbia. In this regard, efforts should be made to increase the accessibility of ICT to small and medium-sized enterprises. It was precisely for these companies that the Information Society Development Strategy from 2010 envisioned "... a strong encouragement of the introduction of ICT into the business of small and medium-sized enterprises, which would contribute to increasing the competitiveness of the national economy" [20]. The analysis, however, shows that this goal has not been fully realised and that in 2016 big companies are still dominant in relation to the small and medium-sized ones in terms of almost all indicators, whereby the differences between companies can sometimes be unreasonably big.

The preliminary analysis based on the selected indicators, carried out in this paper, could be an introduction to a more detailed analysis, which should certainly be performed in Serbia. The next step would be the analysis of the impact that the application of ICT had on the development of Serbian economy. Has the development of ICT in companies really contributed to increasing the competitiveness and productivity of Serbian companies? An additional analysis would comprise the comparison of other numerous indicators of ICT application, as well as a comprehensive analysis of the size of enterprises, activities of Serbian economy and regions. A whole series of topics would open up in such a research – questions concerning the future ICT policy development, the problem of regional differences. A more detailed analysis would indicate the measures of economic and structural policy and the goals to be defined when formulating the next ICT development strategy after 2020.

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ORIGINAL SCIENTIFIC PAPER
UDK: 338.482:159.9
005.336.3:338.487
DOI:10.5937/EKOPRE1706403D
Date of Receipt: June 17, 2017

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THE IDENTIFICATION OF SATISFACTION DRIVERS OF VACATION TRAVELING TOURISTS

Identifikacija pokretača satisfakcije turista koji putuju zbog odmora

Abstract

Tourist satisfaction is an important component in management and marketing of tourism destinations and companies which perform their business activity within the tourism sector. Managing customer satisfaction is necessary in order to secure a long-term tourism development within destinations and profitable business of tourism companies in the long-term. Tourism is a complex business area and vacation traveling tourists use a great number of different services. Different services influence tourist satisfaction. The analysis within the paper considers the basic groups of services used by tourists before traveling and services used during traveling in order to determine their influence on satisfaction. The analysis has been performed based on empirical research and the usage of statistical analyses, such as confirmative factor analysis, SEM (structural equation modeling) analysis and t test for two independent samples. Service used by travellers before traveling and during traveling have been regarded separately. The analysis has been performed with vacation traveling tourists and the ones using services of tourism agencies. The selection of this category of tourists has been made in order for the analysis to encompass all the services from the moment of traveling decision making until the return from the voyage. Based on the analysis key satisfaction drivers have been identified. The paper also analyzes the difference between tourism satisfaction drivers of tourists which have used the service of the traveling agency for the first time and the tourists which have used these services mutiple times up to now.

Keywords: *satisfaction, satisfaction drivers, vacation, tourists, services*

Sažetak

Satisfakcija turista je važna komponenta u upravljanju i marketingu turističkih destinacija i preduzeća koja svoju poslovnu delatnost obavljaju u turističkom sektoru. Upravljanje satisfakcijom turista je neophodno kako bi se obezbedio dugoročni razvoj turizma u destinacijama i profitabilno poslovanje turističkih preduzeća na dugi rok. Turizam je složena delatnost i turisti koji putuju zbog odmora koriste veliki broj različitih usluga. Različite usluge utiču na satisfakciju turista. U radu su uzete u obzir osnovne grupe usluga koje turisti koriste pre putovanja i usluga koje koriste u toku putovanja kako bi se utvrdio njihov uticaj na satisfakciju. Analiza je urađena na osnovu empirijskog istraživanja i primene statističkih analiza, kao što su konfirmativna faktorska analiza, SEM analiza i t test za dva nezavisna uzorka. Odvojeno su posmatrane usluge koje turisti koriste pre putovanja i usluge koje turisti koriste u toku putovanja. Analiza je rađena kod turista koji putuju zbog odmora i koriste usluge turističkih agencija. Odabir ove kategorije turista je urađen kako bi u analizi mogle da se obuhvate sve usluge od momenta donošenja odluke o putovanju do povratka sa putovanja. Na osnovu analize identifikovani su ključni pokretači satisfakcije. U radu je analizirana i razlika u pokretačima satisfakcije turista koji prvi put koriste usluge turističkih agencija i turista koji su ranije koristili usluge.

Ključne reči: *satisfakcija, pokretači satisfakcije, odmor, turisti, usluge*

Introduction

The tourism industry is of great importance when it comes to developing national economies. Within areas of developed tourism activity, due to direct and indirect economic effects, tourism significantly contributes to the GDP. Besides the contribution to the growth of GDP, there is also a significant influence on the growth of employment, bearing in mind that tourism is a labor-intense business area. Due to stated effects, when it comes to planning of economic development of national economies, tourism as a business has a great importance.

During the last decades, tourism has been considered as one of the fast growing economic sectors, with the average growth rate beyond 4% [57, p. 90-99]. According to the officially published data of the Global Tourism Organization in 2014, the number of international tourism travels was around 1,13 billion, which is 4.3% more compared to the previous 2013. The highly growing demand opens up the possibility for the creation and profitable business of tourism companies of different profile: tourism agencies, tour operators, hotels, restaurant companies, hospitality objects etc.

Bearing in mind the fact that tourism business is characterized by a high degree of innovation in business processes and the dynamics in preferences of service users, there is an evident pressure onto tourism destinations and tourism companies for constant business improvement and adjusting the offer to the demands of the market. Consequently, the measuring and customer satisfaction management has become crucial for the survival, development and success within service sectors, such as tourism [53, p. 459-479].

The basic idea of the paper is to analyze the drivers of vacation traveling tourists, which travel to summer tourist destinations and use the services of tourism agencies. Due to the different nature of the services, satisfaction drivers of services used before the voyage and the ones used during the voyage shall be analyzed separately. The analysis has been performed based on an empirical research carried out in Serbia in 2015, based on a sample of 341 respondents which have traveled due to summer holiday. According to the National Association of tourism agencies and tour operators (JUTA) in 2014, 874.322 tourists traveled on their vacation using the services of tour operators.

Tourism satisfaction

The most frequently used definition of satisfaction is the one that says that satisfaction is the estimate of customer expectation fulfillment [49, p. 78]. Analog to the general definition, in tourism, satisfaction is defined as a degree to which tourist expectations have been fulfilled. The expectations of consumers are defined as ideal or desired states of products and services being bought [54, p. 132]. When it comes to relationship between expectations and satisfaction, the expectations represent the estimate created based on previous experience in consuming products/services or gathered information about a product [48, pp. 25-48].

In modern tourism satisfaction is paid great attention, since it influences the selection of destination, travel, services, as well as the decision about the repeated visit to some destination, or used service of a tourism company. Tourists form in advance their expectations concerning the stay within a certain destination or using a service. Thus, their satisfaction during or after the travel or using the services is directly determined by the degree of fulfilled expectations [27, pp. 81-99].

While measuring and grading tourist satisfaction it is necessary to understand the factors which influence it. Based on Vavra`s two-dimension satisfaction model [56] Matzler & Sauerwein defined three groups of factors which influence consumer satisfaction in different ways. These are: basic factors, excitement factors and performance factors [35, pp. 314-322]. The grouping has been performed based on product and service attributes, depending how they influence consumer satisfaction. The basic factors are defined as border factors, meaning that if they are not reached, extreme dissatisfaction arises, and if they are reached, that does not cause satisfaction. The second group of factors are excitement factors which lead to satisfaction if expectatitons are fulfilled, while if not, that shall not cause dissatisfaction. The last group of factors, performance factors, are the ones which act two-ways, generating satisfaction and dissatisfaction based on whether the expectations have been fulfilled or not.

Bearing in mind the evident importance of tourism satisfaction onto the development of tourism destinations,

as well as onto all tourism products and services, the number of studies dealing with this is issue is growing [29, pp. 260-269], [10, pp. 297-308]. The study performed by Kozak & Rimmington has shown that satisfaction influences the decision while choosing a destination, consuming a product or a service at the destination, as well as the decision to visit the destination again. Similar research has shown that satisfaction is in the function of expectations and the total experience while traveling [2, pp. 52-73]. After carrying out the comparison of expectations with actual performance of the destination, satisfaction dealing with the destination in question can be graded [29, pp. 260-269].

Different product attributes are differently preferred by tourists, and tourists have different expecatitons from different attributes. This is confirmed by a study carried out by Aksu, İçigen & Ehtiyar [4, pp. 66-77]. This study was aimed at comparing the expectations and tourism satisfaction visiting the Antalya region in Turkey, in order to define the weaknesses and advantages of the regional tourism, in order to improve it. The results have shown that tourist expectations concerning food and shopping were high, but that the degree of satisfaction after traveling was low. Low expectations were followed by low satisfaction in case of local transport, culture events, communication with the local population, sport activities, cleanness etc. The improvement of these factors has been graded as a possibility for improving the tourism of Antalya. Factors for which tourists had high expectations, and which resulted in even greater satisfaction are: convenience for family travel, the services of food and drink, cultural values, accomodation services and the hospitality of the local population. These factors have been recongized as the key factors on which to base both short-term and long-term competitive advantage of this tourism destination. The results of this study indicate the fact that satisfaction can be managed, and that sucess within that field can have positive effects on tourism. So, konwing the expectations and tourism preferences is of key importance for the growth of their satisfaction, which furhter leads to fulfilling of one of the main goals of every tourism entity, and that is to form a loyal customer.

The services used by vacation traveling tourists

The tourism industry is complex, which derives from the fact that creating a tourism product is influenced by a great number of factors which are connected to tourism destinations, as well as a great number of services offered by different tourism companies during the travel [22]. Vacation traveling tourists use a great number of different services and enjoy attractions of destinations which they perceive as parts of the unique product [51, pp. 368] which essentially means that there is a great number of different attributes which influence tourism satisfaction.

The macro value chain in tourism based on which a tourism business system can be pereceived creates a complex tourism product. The macro value chain in tourism is analyzed by a great number of authors from many perspectives [40, pp. 55-61], [50], [54].

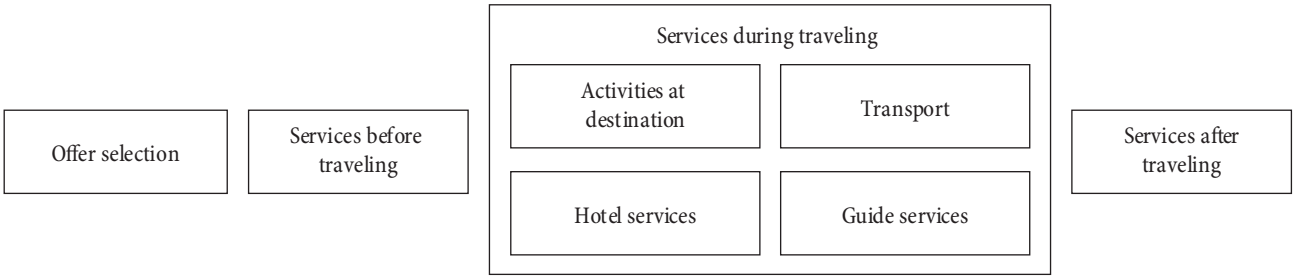
Yilmaz & Bititci have defined the value chain from the perspective of the tourist as a way of encompassing all business systems involved in offering the service, from the moment of making a decision on traveling, performing the necessary activities before traveling up to the very return from traveling. The analysis from the perspective of the tourist is a needed (assumed) approach within the satisfaction analysis, so the value chain defined by the stated authors shall be presented in detail [57, pp. 139-149].

The Yilmaz & Bititci value chain is divided according to phases which tourist perform during travel. The value chain is shown is shown within Figure 1.

The value chain presented within Figure 1 is composed of four parts:

- The offer selection which includes activities beginning from the moment of gathering information needed for the estimate of alternatives up to the final decision making about travel selection.
- The services before traveling represent a part of the value chain referring to offering services which enable tourists to perform a series of activities needed for the realization of the journey.These activities include: informing about the characteristics of the offer, information about the content of package arrangement, service payment, voucher take-over, gathering information important for the realization of the journey (weather conditions, the needed measures

Figure 1: The tourism value chain



Source: [57, pp. 139-149].

of protection etc.), getting visas for passports for particular foreign destinations etc.;

- The services during traveling include different elements of the value chain which influence the creation of the tourism product which the tourists get during the very journey. The elements of the tourism product which are connected to this part of the value chain are: tourist transport (from and to the tourism destination), activities during the tourists' stay within tourism destinations (sightseeing and/or a stay near a naturally attractive area, the activities within the destination connected to built infrastructure, the sightseeing of the cultural and historic heritage etc.), fun activities, accomodation services etc. [57, pp. 139-149].
- The services after traveling refer to the part of the value chain which includes activities performed after traveling. First of all, that refers to correction measures in case some of the services have not been offered to tourist, or in case the obtained value was not adequate compared to the one promised while making a contract.

The empirical research

The main goal of the carried out empirical research is to identify the key satisfaction drivers of tourists before going on vacation and during the vacation. In that concept, two research models have been developed. Model 1 includes two factors which drive the satisfaction of tourists before the very travel. These are: the activities of the desk service and call centers within tourism agencies, as well as marketing activities (shown within Table 1). Model 2 includes variables which can significantly influence the satisfaction during the very travel and stay within a tourism destination (shown within Table 2). The independent variables of this model are: transport quality, accommodation quality, the quality of work of the tourism guide, the facultative excursions and the quality of the destination. Within both suggested models, the general level of tourism satisfaction represents a dependent variable.

Statements made within the research have been chosen based on the review of marketing literature. Every variable within the questionnaire has been measured using various statements, except satisfaction which has been measured by one statement taken over and adopted from previous research [11, pp. 55-68], [12, pp. 336-346]. All statements were measured using a five-grade Likert scale (1- I absolutely disagree, 5- I absolutely agree, except in the case of satisfaction where grade 1 means that the questionnaire is very dissatisfying, while the grade 5 means that the questionnaire is very satisfying).

The data analysis has been carried out within the Statistical package for social sciences, as well as in AMOS. From the used statistical analyses within the research, SEM analysis and t test for two independent samples were used. For the estimate of accordance and the validity of the model confirmative factor analysis has been implemented. As adequacy measurements of the model, we used: ratio $\chi 2/df$, comparative fit index, Tucker- Lewis index, Incremental Fit index and Root mean square error of approximation index. Also, the convergent and discriminatory validity of the model have been tested, as well as composite confidentiality. Based on the value of Cronbach's alpha coefficient internal consistency of statements used for measuring latent variables was analyzed. In order to test the relations between independent variables of both models and satisfaction (as a dependent variable) SEM analysis was used. Finally, using the t test for two independent samples

it was determined which statements within the questionnaire expressed statistically significant differences in attitudes of the respondents which used the services of tour agencies in Serbia for the first time, and those which had used those services in the past as well.

The sample

The research has been carried out on a sample of 341 respondents who have used the services of Serbian tourism agencies. Precisely, these respondents have all traveled during their summer holiday to the Greek island of Zakynthos. The survey has been carried out in two phases. Within the first step, the respondents who have agreed to participate within the research, before going on holiday obtained along with their vouchers questionnaire within which they rated the activities of the desk service and call centers within tourism agencies, as well as the marketing activities of agencies. Filled out questionnaires were handed over by the respondents to the guides within the Nikola Tesla Airport, Belgrade, the capital of Serbia, before the very journey to Zakynthos. Out of 414 respondents which have obtained the questionnaires within the agencies, 377 returned the filled out questionnaires to the guides. After having returned from the island of Zakynthos, using e-mails questionnaires were sent to the respondents which have agreed to participate within the research. A total of 377 questionnaires was sent, out of which 355 respondents returned the filled surveys to the interviewers. Having revised the collected questionnaires, the researchers have excluded 14 incomplete surveys from further analysis.

Table 1: Tourist satisafaction factors before the travel

Satisfaction factor	Facts upon which the factor has been graded	Sources based on which the statements were defined
- the activities of the desk service and call centers within tourism agencies	- Kindness - Prevenance - Efficiency at work - Imformativeness	- [26]; - [14, pp. 45-54]; - [28]; - [17, pp. 1-57]
- the marketing activities of agencies	- Internet page - Catalogs with travel programs - Ads within newspapers - Traveling programs in agencies	- [7, pp. 49-83]; - [34, pp. 107-121]

Table 2: Tourist satisafaction factors during the travel

Satisfaction factor	Facts upon which the factor has been graded	Sources based on which the statements were defined
- transport quality	- The adequate departure time - The comfort of the transport unit - Animation during transport - Quality of transfer within destination	- [6]; - [15, pp. 312-322]; - [24, pp. 35-42].
-accommodation quality	- The hotel location - Contents within the hotel - Quality of food and drinks - Cleanness - Staff kindness	- [52, pp. 324-343]; - [16, pp. 74-79];
- the quality of work of the tourism guide	- Organization of the sightseeing - Interpretation quality - Hospitality during the stay - Kindness	- [26]; - [57, pp. 90-99]; - [8, pp. 24-36];
-the facultative excursions	- The importance of locations being visited - The atmosphere within the group during the visit - The quality of interpretation	- [46, pp. 43-52]; - [9, pp. 345-354]; - [57, pp. 90-99];
- The quality of destination	- Quality of sea and beach - Fun within the destination - Culture and history of the destination - Image of the destination	- [51, p. 368]; - [46, pp. 43-52]; - [18, pp.137-152].

The segmentation of the respondents was carried out using several criteria. The research included 159 respondents which used the tourism agency for traveling for the first time and 182 respondents who have used the services of travel agencies before as well. Out of the total number of participants, 290 of them executed their summer vacation during the season (July-August), while 51 respondent executed their summer vacation during pre-season or post-season (June or September). The respondents were staying at 2,3,4 and 5 star hotels. 103 respondents were staying at a 2-star hotel, 109 respondents were staying at a 3-star hotel, 74 respondents were staying at a 4-star hotel and 55 respondents were staying at a 5-star hotel.

The cofirmative factor analysis has been used with the aim to estimate the fit and validity of both suggested models. In case of the first model (which encompasses the satisfaction drivers before going on holiday), first of all the two statements which had a low level of correlation with the variable to which they belonged were excluded from further analysis. The final model has shown an adequate level of fit ($\chi 2/df = 2.22$; CFI = 0.985; TLI = 0.974; IFI = 0.986; RMSEA = 0.060). When it comes to the second model (which contains the drivers of satisfaction during the very holiday), from the initially conceived model four statements were excluded which have shown a low level of correlation with the variable they were used to measure. After that, the model has shown an acceptable level of fit ($\chi 2/df = 2.76$; CFI = 0.946; TLI = 0.924; IFI = 0.947; RMSEA = 0.072). As can be seen within Table 3, the value $\chi 2/df$ for both models is lower than treshold 3 suggested by Carmines & McIver [13]. Bearing in mind the values of CFI, TLI and IFI, which are higher than 0.9 with both models, we can state that in both cases we have a good fit [5, pp. 74-94]. Also, the values of RMSEA index with both models are lower than the treshold 0.08, which indicates the acceptable level of fit [25].

All confirmative factor loads are higher then 0.65. Average variance extracted (AVE) from every variable with both models surpasses the threshold of 0.5, thus securing a converegent validity [21, pp. 39-80]. The condition of the discriminatory value has been satisfied with the fact that the AVE of every latent variable is higher than the sqaured coefficient of correlation between the given variable and every other variable individually. Both models also possess the satisfactory level of composite confidentiality, since the composite teliability values of all constructions are higher than 0.8 (presented within Table 4). Finally, the value of the Cronbach's alpha coefficient for all variables surpasses the minimum needed threshold of confidentiality of 0.7, which was recommended by [47].

By using the SEM analysis, a statistical significance of influence of independent variables of both models onto the satisfaction of the tourists has been determined. When it comes to model 1, the results confirm the significance of the bond between the activities of the desk service and call centers and satisfaction ($\beta = 0.395$, п 0.01). The results are shown within Table 5. Marketing activities as well stand out as a statistically important satisfaction driver ($\beta = 0.137$, п 0.05). However, the influence of marketing activities onto the

Table 3: Fit indices for models 1and 2

Fit indices	$\chi 2/df$	CFI	TLI	IFI	RMSEA
Recommended values	< 3	> 0.90	> 0.90	> 0.90	< 0.08
Values within model 1	2.22	0.985	0.974	0.986	0.060
Values within model 2	2.76	0.946	0.924	0.947	0.072

Table 4: AVE, CR and Cronbach's alpha

Variables	AVE	CR	Cronbach's alpha
Desk service and call centers	0.66	0.85	0.83
Marketing activities of agencies	0.62	0.83	0.82
Transport quality	0.71	0.88	0.87
Accommodation quality	0.60	0.82	0.82
Quality of work of the tourism guide	0.82	0.94	0.95
Facultative excursions	0.55	0.83	0.83
Quality of destination	0.62	0.83	0.83
Satisfaction (this variable has been measured using only one statement)	-	-	-

satisfaction of tourists is somewhat weaker compared to the influence of desk service and call centers within agencies. Four out of five regarded relations within model 2 are statistically significant (also shown within Table 5). So, out of five regarded antecedents of tourism satisfaction during the traveling, the biggest influence is made by the quality of destination (β = 0.515, п 0.01). Somewhat weaker, but also significant influence is made by the quality of transport (β = 0.313, п 0.01), facultative excursions (β = 0.177, п 0.05) and accommodation quality (β = 0.109, п 0.1). However, the results of the carried out study have not shown a significant correlation between the quality of work of the tourism guide and tourist satisfaction.

Table 5: The results of SEM analysis

The tested relationship	The standard regression coefficient
Desk service and call centers → satisfaction	0.395***
Marketing activities of agencies → satisfaction	0.137**
Transport quality → satisfaction	0.313***
Accommodation quality → satisfaction	0.109*
Quality of work of the tourism guide → satisfaction	0.079
Facultative excursions → satisfaction	0.177**
Quality of destination → satisfaction	0.515***

Using the t test for two independent samples a desire was expressed to determine do significant differences in respondent attitudes occur between the tourists which have used the services of an agency for the first time and the ones that have used those services in the past as well (presented within Table 6). The results show that the grades of statements concerning the activities of the desk service and call centers are not statistically significantly different between the two regarded groups. On the other hand, tourists which have previously used the services of the travel agency have more positive attitudes when it comes to statements which reflect the marketing activities of the agencies, the quality of transport and the quality of accomodation. In case of statements dealing with the measurement of the remaining three independent variables (Quality of work of the tourism guide, Facultative excursions and Quality of destination) there have been no noted significant difference

Table 6: The results of t test for two independent samples

Statements	Group 1 M (SD)	Group 2 M (SD)	t value
The employees at the desk service and call center are attentive	4.58 (0.76)	4.62 (0.69)	- 0.46
The employees at the desk service and call center offer the right information	4.45 (0.83)	4.58 (0.71)	- 1.53
The employees at the desk service and call center are efficient	4.22 (1.09)	4.33 (0.92)	- 1.05
Catalogs are of good quality	4.44 (0.88)	4.68 (0.60)	- 2.85**
Radio and tv commercials are of good quality	4.21 (1.05)	4.50 (0.76)	- 2.91**
The magazines are of good quality	4.40 (0.88)	4.61 (0.68)	- 2.55*
The transport to destination is well organized	3.59 (1.22)	4.25 (1.04)	- 5.35**
The transfer within destination is well organized	3.97 (1.12)	4.56 (0.75)	- 5.58**
The desk service at the airport is well organized	4.01 (0.92)	4.55 (0.75)	- 5.94**
The content during the stay at the hotel is of good quality	3.64 (1.19)	4.07 (1.11)	- 3.44**
The food at the hotel is of good quality	3.68 (1.29)	4.13 (1.09)	- 3.42**
The hotel is clean	3.87 (1.20)	4.24 (1.09)	- 2.90**
The tour guides offer the needed information	4.34 (1.09)	4.43 (0.98)	- 0.84
The interpretation of the tour guide is of good quality	4.24 (1.18)	4.40 (1.07)	- 1.33
The tour guides are attentive	4.51 (0.97)	4.60 (0.90)	- 0.88
The tour guides have good organization skills	4.34 (1.10)	4.44 (1.01)	- 0.92
The excursions are attractive	4.36 (0.88)	4.45 (0.84)	- 0.98
The excursion prices are affordable	4.16 (1.00)	4.23 (0.96)	- 0.69
The excursion are well organized	4.16 (1.02)	4.21 (0.98)	- 0.52
The work of local guides is satisfactory	4.18 (0.95)	4.10 (1.06)	0.71
The sea is nice	4.48 (0.76)	4.61 (0.66)	- 1.70
The destination has a good content when it comes to animation	4.14 (0.93)	4.37 (0.79)	- 2.52*
Beaches are nice and well kept	4.18 (0.93)	4.22 (0.98)	-0.47
The general level of satisfaction	4.28 (0.98)	4.58 (0.76)	- 3.19**

M- mean; SD- standard deviation; Group 1- respondents which are traveling for the first time using the given agency; Group 2- respondents which have used the services of the given agency to travel in the past as well.

in the grades od the respondents. Only the tourists which have previously used the services of the tourism agencies have shown a more favorable attitude when it comes to the statement "The destination has a good content when it comes to animation". Although a certain number of statements have not shown significant differences, the general level of satisfaction is higher with tourists which have previously used the services of an agency, compared to those which are using the services of an agency for the first time.

Conclusion

The significance of the carried out study can be seen in the identification of the factors which drive tourist satisfaction. Thereby, the study offers a contribution to the existent literature through developing the satisfaction drivers before and after the very voyage. It is very important to direct the managerial efforts towards creating the tourist satisfaction, in order to improve the business performance. Within that context, it is first necessary to determine the key satisfaction drivers. The contribution of the study is also a comparative analysis of the attitudes of tourists which have used the services of the agency for the first time and the ones which have used the services of agencies earlier as well, when it comes to the elements of service offer of tourism agencies. With this kind of analysis we come to the precise degree of tourist satisfaction of tourists which have used the services of the agency for the first time compared to the satisfaction of those tourists which are loyal to a certain degree to that agency, since they have used its services previously.

The results have shown that the destination quality is the most important driver of satisfaction. While going on a summer holiday, tourist firstly pay attention to the quality of the sea, tidiness of the beaches and the attraction content within the destination they visit. Also, the good organization of transport stands out as an important factor which leads to satisfaction. Many tourists obviously want to get as quick as possible and as with little effort as possible to the desired destination. The obtained result offers useful suggestions to the services lenders directing them to improve the efficiency of the tourist transfer system. It is interesting to point out that quality of work of the tourism guide does not have a significant influence onto the tourist satisfaction. Namely, many tourists who visit the Greek islands independently arrange the content of their stay, they rent automobiles and daily visit different beaches. Due to that, these tourists do not tend to rely to much onto tour guides. When it comes to factors which motivate satisfaction before departure on holiday, it is important to point out that the activities of the desk service and call centers within agencies stand out as factors of greater importance compared to the marketing activities of the agency. This result indicates that tourists which use the services of tourism agencies prefer to gather all needed information personally in conversation with employees. The quality of interaction between employees and clients is a very important element of the service offer of the tourism agencies. Within that context, it is desirable for the empolyed staff to be professional, efficient and to offer all the needed information to the clients, but also to treat them with respect, empathy, as well as with readiness to assist at any moment.

Based on the obtained results we can conclude that concerning the work of desk service, call centers, tour guides and the organization of facultative excursions, there are no significant differences in attitudes of tourists using the travel agency for the first time, and those which have used the agency services before as well. It is needed to emphasize that the quality of work of the employees at the desk service and the call center is almost identically seen by both groups of tourists. That means that the attitudes of new tourists regarding this element of the service offer are similar to the attitudes of loyal tourists which have used the given agency to go on vacation before. This is a significant finding which indicates a high level of quality of the offered service in the period before going on holiday. However, regarding the organization of transport to the destination there are notable more favorable attitudes of tourists which have used the services of tourism agencies before. The obtained result does not necessarily mean that tourists which use the services of the agency for the first time are not satisfied with the quality of transport to the destination. It is possible the before the very travel they have had somewhat of higher expectation compared to the ones which have used the services of tourism agencies before, who based on the previous experience knew what they could expect.

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PRELIMINARY PAPER
UDK: 658.818:629.3(497.11)
339.137.2
DOI:10.5937/EKOPRE1706413D
Date of Receipt: May 23, 2017

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BASIC CHARACTERISTICS OF COMPETITIVE RELATIONS IN THE AFTER-SALES MARKET OF MOTOR VEHICLES IN SERBIA

Osnovna obeležja konkurentskih odnosa na posleprodajnom tržištu motornih vozila Srbije

Abstract

The aftermarket (guarantees, services, sales and use of replacement parts and accessories) is characterized by a large number of users on the demand side, while acquisition of this type of product is treated as capital procurement (purchase of cars, trucks, buses, etc.). Capital procurement is symbolized by large expenditures, a relatively long shelf life, as well as a significant share of maintenance costs, namely servicing the products at the expense of the buyer, etc. After-sales servicing and the supply of spare parts provided by individual manufacturers are important elements when deciding on the purchase of a vehicle. However, it is difficult for consumers to foresee the cost of total purchase (the price of the primary product and the total cost of post-sales services over the period of use), since vehicles are consumed for a long period of time after the purchase (and expiration of the warranty period) which includes a large number of regular servicing and emergency repairs. Accordingly, the primary goal of this paper is to deepen the knowledge and analysis of the basic features of this market, which is significant for the budget of a large number of users, since the previous information on the topic is extremely limited. In addition, the analysis of the structure and the main actors (authorized and independent service providers) and their competitive relations is of great importance for all drivers of motor vehicles, as it can assist them in planning and budgeting not just of repairs but also the purchase of motor vehicles, and accordingly reduce the risk of poor decisions related to the purchase of primary products and selecting providers of after-sales service during the period of use of the product.

Keywords: *aftermarket, motor vehicle, competition, automotive, Serbia*

Sažetak

Tržište posleprodajnih usluga (garancije, servisne usluge, promet i korišćenje rezervnih delova) karakteriše veliki broj korisnika na strani tražnje, dok se nabavka ove vrste proizvoda tretira kao kapitalna nabavka (kupovina automobila, teretnog vozila, autobusa i dr). Kapitalnu nabavku odlikuje veliki novčani iznos, relativno dug rok trajanja proizvoda, kao i značajno učešće troškova održavanja, odnosno servisiranja proizvoda u budžetu kupca i sl. Postprodajne usluge servisa i nabavke rezervnih delova koje pružaju pojedini proizvođači važni su elementi prilikom odlučivanja o kupovini nekog vozila. Međutim, potrošačima je teško da sagledaju cenu ukupne nabavke (cenu primarnog proizvoda i ukupne troškove postprodajnih usluga u toku perioda korišćenja), s obzirom na to da se vozila koriste u dugom vremenskom periodu nakon kupovine (i isteka garantnog roka) što uključuje veliki broj redovnih servisa i vanrednih popravki. Shodno tome, primarni cilj ovog rada je produbljivanje saznanja i analiza osnovnih obeležja ovog tržišta, značajnog za budžet velikog broja korisnika, jer su dosadašnja saznanja o njemu izuzetno ograničena. Uz to, analiza strukture i glavnih aktera (ovlašćenih i samostalnih servisera) i njihovih konkurentskih odnosa od velikog je značaja za sve vozače motornih vozila jer im može pomoći prilikom planiranja i budžetiranja ne samo popravki već i kupovine motornih vozila i smanjiti rizik od pogrešno donetih odluka vezanih kako za kupovinu primarnog proizvoda tako i za izbor pružaoca posleprodajnih usluga u toku perioda korišćenja motornih vozila.

Ključne reči: *posleprodajno tržište, motorna vozila, konkurencija, autoindustrija, Srbija*

1 This paper is a part of research projects Nos. 47009 (European integrations and social and economic changes in Serbian economy on the way to the EU) and 179015 (Challenges and prospects of structural changes in Serbia: Strategic directions for economic development and harmonization with EU requirements), financed by the Ministry of Education, Science and Technological Development of the Republic of Serbia.

Introduction

Aftermarkets (secondary markets) can be defined as markets for complementary products (secondary products) which are usually purchased subsequent to the purchase of another, related product (primary product) [7], [13]. Over the past few decades, as a result of altered customer demand, as well as of increased competition and diminishing profit margins, the aftermarket business has gained strategic importance for numerous industries. The aftermarket services stabilize long-term revenues of firms, enhance customer satisfaction, but also offer a vital strategic weapon in a competitive environment. For these reasons, an increasing number of firms acknowledged aftermarkets as an abundant source of revenue and profit.

The aftermarket is reasonably different from the "classic" market of products and (some other type of) services, for several reasons:

- The aftermarket is significantly determined by the primary market, since the change in volume and structure of the automotive market remarkably influences the movement in the relevant secondary, post-sales market of motor vehicles;
- The position of the suppliers in the primary market greatly influences the intensity of competitive relations and, consequently, the level of product prices in the post-sales services market and other competition parameters. However, there is a possibility that suppliers who do not hold a dominant position in the primary market and operate at different levels of the production and sales chain by using certain non-price or price factors, significantly affect the intensity of competition in the aftermarket, by applying different marketing strategies aimed at linking the buyer of the primary product with after-sales services, provided by the OEM and/or their distributors and servicers;
- Many suppliers operate simultaneously in the primary and secondary markets, achieving a significantly higher level of profit in secondary market, and creating recommendations for entry of competitors to the primary or secondary market.
- The automotive aftermarket represents an important subsystem of the overall services market. The United States automotive aftermarket is estimated to be worth $318.2 billion (2013), contributing with more than 2.3% to GDP. The aftermarket employs 4.2 million people who work at manufacturers, distributors, retailers and repair shops [2]. In Western Europe, over 848 thousand companies that employ 4.7 million people operate in various segments of this market, and the market generates significant revenues, which even exceed revenues from the sales of new vehicles. Here, producers report that 67% of their revenue comes from the aftermarket, while 33% is related to the sales of new vehicles. At the same time, it is considered a very lucrative activity (the so-called cash cow) for motor vehicle manufacturers, where producers achieve high profit rates [33, p. 7].

In the Republic of Serbia, the automotive aftermarket involves a large number of economic entities (over 2,000 companies and a number of entrepreneurs dealing with servicing and trading in spare parts). It is considered as a complex, fragmented and often non-transparent market. A significant number of servicemen (and self-employed handyworkers) operate in the gray area, and according to the results of the conducted survey, the quantity of spare parts that are marketed through gray channels and mostly come from car wastes is not negligible. Therefore, it is very difficult to precisely determine the dimensions of this post-sales market, as well as the business methods and behavior of all relevant actors.

The automotive aftermarket (guarantees and services concerned with the manufacturing, remanufacturing, distribution, retailing and installation of all vehicle parts, chemicals, equipment and accessories) in Serbia, or its competitive relations, have not been the subject of a more detailed analysis so far, and therefore the information about this market is extremely limited. As it is an unexplored market, whose characteristics preoccupy the majority of drivers, the authors of the paper believe that examination of the basic dimensions, structure, characteristics and current problems in the automotive aftermarket is significant both for the actors and for the state that should promote responsible behavior of all participants in this

market through appropriate legal regulations. Therefore, the fundamental aim of the research is to identify specific market structure, the behavior of market players and the types of relations between them, as well as the analysis of the factors affecting the after-sales service and customer satisfaction.

Literature review

Given its size and growth prospects, it is surprising that the automotive aftermarket has so far been explored in a relatively small number of studies and scientific papers. Contrary to other main business processes, the aftermarket has long been treated by business literature without the attention it deserves [4], [23]. However, a number of studies have recently investigated the increasing importance and role of aftermarket services from various perspectives.

Different authors point out that aftermarket services have occurred as a major source of competitive maneuvering, so companies struggle for competitive advantages with their after-sales service portfolio to differentiate their offer from the competitors [31], [40]. In addition, it is denoted that the after-sales activities are recognized as a primary source of revenue, profit and competitive advantage for many industries [30]. The provider can ensure product functionality and thereby customer satisfaction by offering different aftermarket services, and therefore they can establish sustainable relationships with customers and contribute significantly to customer satisfaction [22]. This may lead to a fruitful relationship between the provider and the customer over time, hence securing more transactions [3].

A certain number of studies that were devoted to the automotive aftermarket has mainly focused on adequate service portfolios for particular products or market segments and aftermarket management [9], [24], as well as spare parts logistics and inventory management [38]. In their research, Domazet and Simeunović (2015) aimed to determine the importance of the criteria that motor vehicle users choose as the starting point for selecting the insurance company. The results of their research showed that the proximity of technical inspection and repair services of motor vehicles, together with the price, is one of the most important criteria for the selection. Furthermore, the focus of a certain number of studies has been on the critical factor of a company's success [19], particularly on spare parts supply, optimal warranty periods, components which should be included or excluded from the warranty, approaches to better utilize the benefits of the replacement parts business, analysis of supply strategies, optimal final order quantities, and so forth.

A large number of papers on the topic of after-sales services market was dedicated to the analysis of various phenomena in the automotive industry. Ehinlanwo and Zairi (1996) performed a study on the concept of motor vehicles after-sales services implemented in Germany and it was conducted by benchmarking four key players including Fiat AG, Nissan Deutschland, Toyota GmbH and Ford Werk AG. They explained the necessary factors responsible for contributing to the after-sales sector in marketing of motor vehicles.

Certain authors [29] have dealt with the practice of durable goods manufacturers who are trying to keep the post-sales services market exclusively for themselves by charging higher prices for their products and services. In doing so, they pointed out that customers are often ready to pay higher prices for repairs and services if they have the benefit of acquiring a high-quality and long-lasting replacement part. It is also observed that the restriction of competition in the automotive aftermarket can strengthen competition in the primary product market [28]. In contrast to the end customers, who are often short-sighted and do not take into account the costs of maintenance and repairs when purchasing consumer durables, manufacturers regularly calculate profit from the sales of primary products and profit from maintenance and repair services. In conditions of strong competition in this market, they may be willing to lower the price of the primary product if they estimate that the lost profit from the sales will be compensated by the profit from the services provided in the secondary market. According to Dombrowski and Engel (2014), the automotive market is presently undergoing a remarkable change – moving from the conventional internal combustion engines to electric mobility. All the various stakeholders operating in the

field of the automotive aftermarket will be influenced by this change.

Last but not least, numerous researchers have concentrated on the legal aspects of aftermarkets. The 1992 "Kodak decision" by the US Supreme Court raised several questions about aftermarkets, and especially about the circumstances under which behavior by the OEMs can have anticompetitive effects [17], [21].

In legal literature, particular attention was drawn to the issue of restrictions in vertical agreements related to competition and the welfare of consumers. By imposing vertical restraints, the manufacturer achieves economic benefits in the form of sales growth, providing additional services for customers and promotional efforts. Bork (1993) argued that vertical agreements are eligible for restricting competition between the distributors of the same brand (intrabrand competition), but that they have no effect on the competition between distributors of different brands (interbrand competition). The OEM thus limits the freedom of the distributor to independently determine the price of its product in further sales or narrows the number of distributors in a particular territory, thereby eliminating competition among the distributors of its brand. The ability of the manufacturer to charge a higher price and achieve greater profit depends on its exposure to the competition of manufacturers of other brands, that is, the power of the interbrand competition.

Finally, in Serbian scientific and managerial literature little attention has been devoted to automotive aftermarket. There is a huge gap between the importance of the aftermarket business for an increasing number of companies and scientific literature dealing with aftermarkets and strategic positioning of its players. In particular, to the best of our knowledge, no publication exists which inspects the Serbian motor vehicle aftermarket competition relations. Although primarily focusing on the aspect of regulatory conventions in the competition protection segment, the study titled Aftermarkets[2], prepared in 2016 for the needs of the Commission for Protection of Competition, provided the analysis of the key dimensions and issues of household appliance and automotive aftermarkets.

Data and methodology

In order to obtain a clear picture of the size and structure of the automotive aftermarket in Serbia and its competitive relations, the research was conducted with a combination of desk, field and expert research methods.

Desk research included the collection and analysis of aggregate data relevant to the after-sales services market, as well as the analysis of the legal framework in Serbia and the EU regulating the aftermarket. The basic sources of aggregate data and information for the preparation of the study were: data from the Serbian Business Registers Agency on the number of participants in the market based on their main activity, as well as the entry and exit of participants in this market and their ownership structure; data from the Ministry of Finance – Customs Administration on import and export of relevant types of products (motor vehicles, best-selling white goods, replacement parts); data from the Ministry of Internal Affairs of the Republic of Serbia, Traffic Police Directorate on the number, structure and age of motor vehicles registered in the territory of the Republic of Serbia; data from the Ministry of Trade of the Republic of Serbia on the sales of white goods and consumer complaints in the motor vehicle and white goods sector; data from the Statistical Office of the Republic of Serbia on production of goods, import and export of motor vehicles and household appliances; data of the Serbian Chamber of Commerce, Trade Association, Commission for Protection of Competition and publicly available data on the Internet.

Field research was carried out in the period from February to May 2017, covering a survey of 68 relevant market participants who belonged to different segments of the automotive aftermarket (importers/distributors of motor vehicles, authorized motor vehicle servicers, independent motor vehicle servicers, motor vehicle spare parts retailers, consumer associations). In selecting companies for the sample of the field research, the basic criteria were: generated income, number of employees, significant share in import, wholesale and retail of motor

2 The results of the research presented in the study Aftermarkets (2016), whose creators are the authors of this paper, are used exclusively as a secondary data source, while the field research conducted in 2017 resulted in the original research data presented in this paper.

vehicles replacement parts. In addition to registered businesses for the listed activities, the sample includes business entities registered as entrepreneurs involved in the servicing of motor vehicles, who represent significant market entities. The survey was carried out on the basis of semi-structured questionnaires, with, in individual cases, a personal interview on the characteristic problems in this segment of the market. After completing all the interviews, the analysis was conducted based on data and cross-case analysis. Research results are presented in the following section of the paper.

Results and discussion

Basic characteristics of the automotive aftermarket in Serbia

There are several reasons why the aftermarket is reasonably different from the "classic" market of products and other types of services. Namely, the after-sales services market correlates to a large extent with the primary market (e.g. change in the volume and structure of motor vehicles sales significantly determines the movements in the relevant, secondary, aftermarket of these products). In addition, the position of the suppliers in the primary market greatly influences the intensity of competitive relations and, consequently, the level of product prices and other parameters of competition in the automotive aftermarket.

The characteristics of the automotive aftermarket are determined by a number of primary market factors. This primarily refers to: the volume and structure of sales of new motor vehicles, the size and structure of certain types of registered motor vehicles, the age structure of registered motor vehicles and the structure of rolling stock by individual brands of registered motor vehicles, trends in the development of new types of vehicles, the average number of kilometers traveled during the year and alike.

The characteristics of the key factors determining the size and structure of the automotive aftermarket in the Republic of Serbia are as follows:

- In the structure of the fleet of registered motor vehicles in the Republic of Serbia (in 2015, a total of 2,262,323 units), passenger cars dominate with over 80% of share. Therefore, it can be concluded that this segment has a dominant impact on the size and structure of the total motor vehicles after-sales market in Serbia.
- In the 2011-2015 period, there was a trend of growth in the number of registered motor vehicles (in 2015, 13.7% more motor vehicles were registered in the Republic of Serbia in comparison with 2011). The increased number of registered motor vehicles is primarily due to increased sales of used vehicles. Due to such trends in sales, the age structure of registered motor vehicles in the Republic of Serbia is very unfavorable. Referring to the fleet of registered vehicles in the Republic of Serbia, the share of newer motor vehicles (those up to 5 years old), which determines the size and structure of the vehicle aftermarket in the guarantee period, is barely 6.5% (and even lower for passenger vehicles – only 5.6%).
- In the 2011-2015 period, the total sales of new passenger cars in the Republic of Serbia amounted to 118,682 units. The best-selling brands of passenger cars in this period were, according to the number of vehicles sold, Fiat with a share of 17.1% in total sales, Škoda with a share of 15.5%, VW with a share of 7.7% and Hyundai with a share of 7.0%. The above data indicate that interbrand competition is very intensive in the primary market (new passenger cars sales market).
- When it comes to the total number of sold motor vehicles of all their brands, none of the passenger vehicles manufacturer groups associated through joint ownership on the global level recorded a market share of more than 30% (VW group: Škoda, VW, Audi, Seat, Porsche; Fiat group: Fiat, Alfa Romeo, Jeep, Lancia, Chrysler; Renault/Nissan group: Renault, Dacia, Nissan, Infiniti; PSA group: Citroën, Peugeot; Toyota group: Toyota, Lexus; GM group: Opel, Chevrolet; Hyundai Motor Company group: Hyundai, Kia; BMW group: BMW, Mini).
- The Herfindahl-Hirschman Index (calculated on the basis of the physical volume of sales of individual brands of new passenger cars) is 713. However, the degree of market concentration could be different if

such a market was segmented into narrower markets. Particularly, if the Herfindahl-Hirschman Index was calculated on the basis of the physical volume of sales of individual brands of new passenger car manufacturers that are globally connected by common ownership, it would be 1,448, which is a sign that it is a moderately concentrated market (Commission for Protection of Competition of the Republic of Serbia, 2016).

- The age structure of registered motor vehicles in the Republic of Serbia is very unfavorable, given that the structure of the fleet is dominated by vehicles older than 10 years. Newer motor vehicles, up to 5 years old, which define the size and structure of the vehicle aftermarket in the guarantee period, is 6.5% in total (5.6% as for passenger vehicles). Average age of registered motor vehicles in the EU (28) is 9.7 years [1, pp. 7-15].
- Observed per individual brands of vehicles, a large number of different brands of vehicles are present in the Republic of Serbia, none of which has a high share (over 25%). The most common brands, per individual types of motor vehicles, are the following: passenger cars: VW 14.56%, Opel 12.53%, Zastava 11.91%, Fiat 10.34%; trucks: Mercedes 15.36 %, Fiat 12.96%, Zastava 9.91%; buses: Mercedes 15.93%, Ikarbus 13.12%, Iveco 6.11%; mopeds: Tomos 16.37%, Piaggio 9.68%, Peugeot 8.53%; motorcycles: Yamaha 16.92%, Honda 15.41%, Suzuki 12.43%, Piaggio 11.17%.

Table 1: Age structure of registered road motor vehicles and trailers in 2015 in the Republic of Serbia[1)] -in percentages-

Vehicle type	Age of motor vehicles in years				
	0-5	6-10	11-15	16-25	over 26
Passenger cars	5.6	15.8	38.5	22.4	17.8
Trucks	10.2	23.0	30.5	16.2	20.1
Buses	14.2	19.5	34.0	15.0	17.3
Mopeds	29.0	40.3	13.1	11.2	6.4
Motorcycles	6.4	28.3	22.3	29.4	13.6
Trailers	8.7	11.1	8.9	11.2	60.1
Working vehicles	9.9	13.4	13.2	18.0	45.4
Total	6.5	16.6	35.2	21.1	20.6

Source: Ministry of Internal Affairs of the Republic of Serbia
1) All vehicles that had a valid registration certificate in any period of the reporting year, were included. Vehicles with temporary license plates, police vehicles, Serbian military vehicles, diplomatic and vehicles of foreign missions are not included.

Different perspectives of certain key stakeholders

Different actors (stakeholders) involved in the automotive aftermarket in Serbia have different interests. An analysis of the economic aspects of establishing a network of official distributors of replacement parts and services, from the perspective of the manufacturer/importer or representative/distributor and consumer's angle can be summarized as follows:

Perspective of the manufacturer/importer or representative and authorized servicers/official replacement part dealers:

- After-sales services are a legal obligation, an important marketing mix instrument, and therefore motor vehicle manufacturers, or their distributors, are making significant efforts to organize their own network of authorized servicers and spare part dealers. By doing this, producers of primary products want to ensure quality in the use of their products and to preserve the reputation of the brand;
- The service providers network, as well as the amount of servicing costs, of certain manufacturers and importers of motor vehicles plays an important role in the sales of motor vehicles. It is especially important in various forms of fleet sales of passenger vehicles, where buyers – legal entities, try to (unlike most private entities) challenge the total cost of procurement (the price of the primary product and the costs of post-sales services during the warranty period);
- As a rule, the dimensioning and territorial structuring of the network of authorized service providers is carried out by importers (general distributors) in cooperation with manufacturers. The status of an authorized service provider grants greater safety in the performance of activities and procurement of replacement parts under more favorable conditions (rebates and bonuses);
- Authorized service providers focus more on the strategy of ensuring good relations with producers/agents and meeting customers' requirements than on achieving short-term savings in their business;
- In the after-sales market of motor vehicles there is a very intense price and non-price competition

between authorized service providers/official dealers of replacement parts and independent service providers and stores with conventional (not original) spare parts. In addition, authorized service providers point out that the greatest problem in their business is the unfair competition of repairers operating in the gray area and offering cheap, low-quality spare parts (which are not controlled by anyone).

Perspective of the consumer:

- Consumers are interested in getting as high quality of service as possible at the lowest possible price, and the key consumer satisfaction factor in the motor vehicle after-sales market in Europe is the price/quality ratio;
- As a rule, during the warranty period and in the period when their vehicles are newer, users of motor vehicles are more oriented toward the purchase of original spare parts and servicing their vehicles at authorized service providers. However, as time passes, they are increasingly focusing on independent service providers and the purchase of parts that are not genuine;
- After-sales servicing and the supply of spare parts from individual manufacturers are an important, but apparently not a crucial element in deciding on the purchase of a vehicle. It is often difficult for consumers to foresee the total cost of procurement (the price of the primary product and the total post-sales services expenditure during the time of use), since vehicles are used for a long period of time after the purchase (and after expiration of the warranty period). This is illustrated in the data obtained from the Ministry of Trade on consumer complaints related to motor vehicles [25]. Out of the 818 complaints received between January 2015 and April 2016, only 6, i.e. 0.7%, refer to service providers (mainly due to refusal to repair within the warranty period because the vehicle buyers had previously "done something" in an unauthorized service shop);
- In the Republic of Serbia, if they want their warranty to be valid, consumers can service and repair motor vehicles within the warranty period only with authorized service providers and can use for the repair only original spare parts. That produces a strong impact on the level of competition in this market segment. In the EU, after the adoption of the Regulation on Vertical Agreements 330/2010, Block Exemption Regulation 1400/2002 and Block Exemption Regulation 461/2010, customers have been given the freedom to choose where they will maintain their vehicles in the warranty period, which eliminated many earlier restrictions and increased competition intensity.

Basic characteristics of competitive relations in the automotive aftermarket in Serbia

Business entities engaged in the maintenance and repair of motor vehicles in the Republic of Serbia, as well as other European countries, can be classified into two groups of service networks, whose position in the market and mode of operation differs:

- authorized service providers,
- independent service providers.

Authorized service providers (OES - Original Equipment Service) – It is estimated that there are about 300-320 authorized service providers for various brands of passenger cars in the Republic of Serbia. The largest number of authorized service providers (over 85%) simultaneously deals with the sales of new (and used) passenger cars, while only about 15% are registered exclusively for maintenance and repair services. Authorized service providers also sell original spare parts, which they purchase from a general importer/distributor or directly from a vehicle manufacturer.

Service providers must meet a range of conditions to be included in a network of authorized service providers of certain motor vehicle brands, with the conclusion of contracts with the general importer/distributor for one plus one year or for an indefinite time in accordance with the precisely specified clauses. Regionally, providers of certain passenger vehicles brand services in the warranty period are mainly located in Belgrade, Novi Sad and Niš, and rarely in Subotica, Šabac, Čačak, Užice, Kragujevac and other cities and towns. The density of the network of service providers who perform the service in the

guarantee period is, with the exception of Belgrade, low. This particularly applies to South and Eastern Serbia, where the nearest authorized servicers are located at a distance of more than 100 km.

Independent service providers (IAM – Independent Aftermarket) – The number of independent service providers is significantly higher, and their structure is very diverse. It is estimated that there are 1,500 to 1,600 independent repairers in the Republic of Serbia, out of which about 1,000 are mechanic workshops (which perform a wide range of maintenance and repair services for various brands), about 180-200 tire service shops, 170-180 car tinsmiths, about 200 service shops for oil and filters replacement, around 40 service providers for sales and installation of auto glass and 50 others**.**

Unlike authorized service providers that mainly deal with maintenance and repair for only one brand of vehicles (brands of one group of manufacturers), independent service providers are, as a rule, oriented toward a wide range of different brands of motor vehicles. Independent service providers purchase original spare parts in different ways, primarily depending on how the sales of these parts of a particular vehicle brand is organized. In certain cases, procurement is done directly from the general importer/distributor, but more often through authorized dealers (servicers)[3]. Most replacement parts used by independent service providers are acquired through major wholesalers that are specialized in this area and offer a wide range of parts (e.g. Wagen International, SANEL, Kit Commerce, Euro 07, Nikom, Delmax d.o.o., Shopgroup d.o.o., Gazelakomerc d.o.o., Simplex d.o.o.), or from a very large number of small trading companies[4].

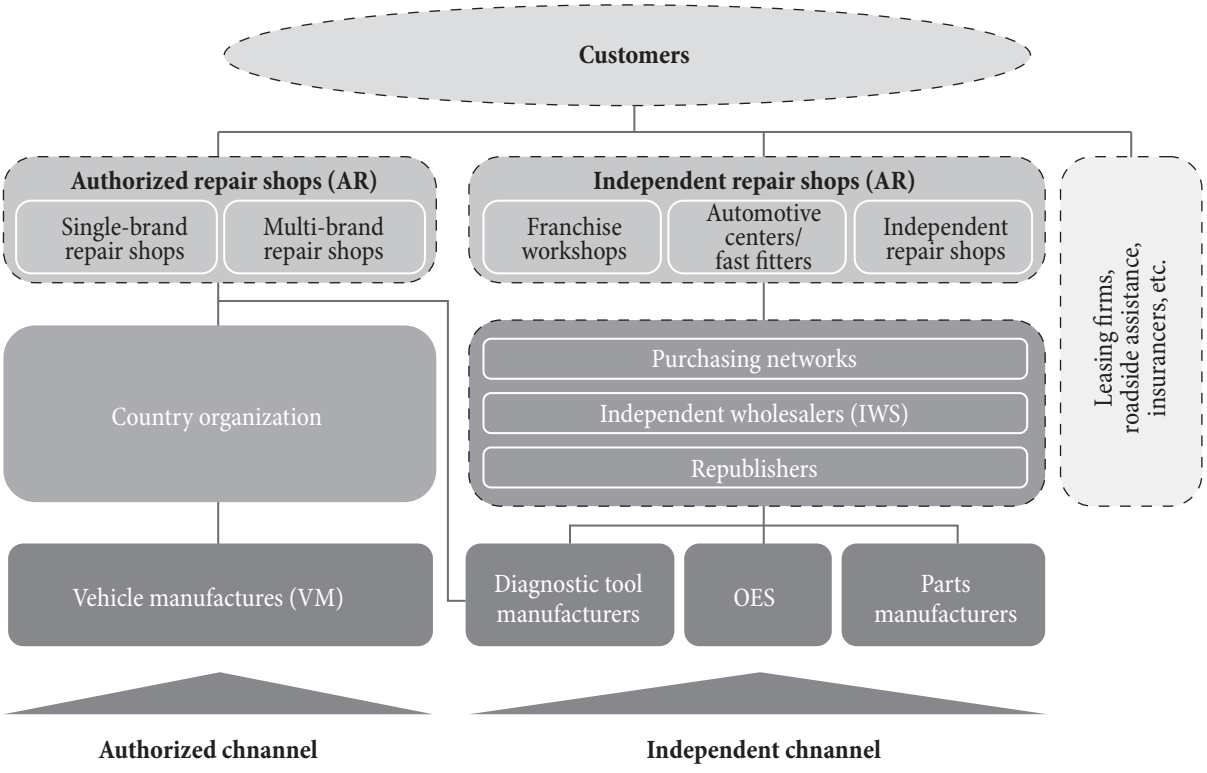
There are differences in the assessment of the work performance of these two groups of service providers in Serbia. According to the results of the surveys conducted, the key performance indicators of authorized service providers (OES) and independent service providers (IAM) in reference to consumers is as follows:

Typically, there are different estimates regarding the performance of the work on the part of authorized and independent service providers respectively. Particularly,

3 Source: Surveys

4 In the EU, most replacement parts distributors are small enterprises (93.7%), medium (5.6%), while only 0.7% are large companies [34].

Figure 1: Structure of the automotive aftermarket in the EU



Source: [35, p. 8.

Table 2: Performance ratings of authorized and independent service providers in the automotive aftermarket (1-unsatisfactory, 5-excellent)

	Authorized service providers	Independent service providers
Price/quality ratio	3.95	3.65
Competency/Reliability	4.28	2.57
Possibility of installing different types of replacement parts	2.25	4.25
Time required for service/repair	3.16	3.27
Time required for scheduling of service/repair	3.75	2.88
Kindness	4.46	3.18
Accessibility (geographical)	3.85	3.40
Price of replacement parts	3.24	3.64
Price of man-hour	3.98	3.65
Special services	4.15	3.17
Customer satisfaction assessment	3.43	3.25

Source: Authors' survey

authorized service technicians offer very poor ranking when evaluating independent service providers on the quality of their work, competence and ability to provide special services. Authorized service providers evaluate positively the possibility of installing different types of replacement parts offered by independent service providers, and consequently the cost of these parts. On the other hand, independent service providers point out that the price and quality of the work ratio of independent servicers is at a higher level than with the authorized service providers (which charge significantly more for replacement parts, while the cost of man-hour is higher). Additionally, independent service providers emphasize that the time needed for servicing or repair is significantly shorter and that geographical accessibility is better because there are more independent than authorized service providers. They also point out that consumers in the automotive aftermarket are more satisfied with them, compared to the authorized service providers (primarily because of the higher prices of replacement parts and labor costs, but also the time needed for repair).

According to the results of the conducted survey, the respondents (authorized distributors) estimated that the market share of the official authorized service providers in the segment of post-sales services is about 45%, while

Table 3: Estimation of the automotive aftermarket structure by authorized distributors of replacement parts in%

	Authorized service providers	Independent service providers
Total (100%)	45.00	55.00
Regular maintenance (servicing)	46.00	54.00
Repairs	55.00	45.00
Other	82.00	18.00

Source: Authors' survey

the average participation of independent service providers is 55%, although it is slightly different when it comes to repairs and regular maintenance (Table 3). In addition, the results of the survey show that servicing and repair of products within the guarantee period participate with 57% in the structure of revenues of authorized service providers generated in 2015, while the share of revenues generated outside the warranty period is slightly lower and is 37% on average. The share of revenues from regular maintenance and repairs of motor vehicles during the guarantee period in total revenues of independent service providers in 2015 is 50% on average, with the same share outside the warranty period.

According to the results of the survey, it can be concluded that the automotive aftermarket in Serbia is extremely competitive, because a large number of actors – about 2,000 authorized and independent service providers operate in it, while none of them, individually, hold a significant market share. This is confirmed by the results of the conducted surveys, whereby the majority of respondents (100% of authorized distributors, 67% of authorized service providers and 75% of motor vehicles replacement part dealers surveyed) estimated that the level of competition in this segment of the market is high. At that, it is especially important to point out to the problem of unfair competition (non-registered companies and servicers), who, given that they do not report taxes and perform activities on the street, offer their services at comparatively significantly lower prices than independent, and especially than the authorized service providers.

Bearing in mind the characteristics of the primary market (sales of motor vehicles in the Republic of Serbia), it can be concluded that interbrand competition in the

market of post-sales services of motor vehicles (competition between manufacturers of different brands and their distributors) is intense. This is why manufacturers and general representatives of certain brands and their distributors are stimulated to offer high quality of service and installation of replacement parts to end customers, despite the fact that they charge a high price on the basic product.

A somewhat different situation is observed in intrabrand competition (competition among distributors/service providers/dealers of replacement parts of the same brand). Manufacturers and general agents impose certain restrictions when it comes to servicing vehicles within the warranty period. These limitations are justified only if they ensure the quality of the after-sales service, but are not justified if this prevents independent manufacturers and servicers of replacement parts to enter the market, because they can offer spare parts of the appropriate quality, that is, the required quality of the service and repair.

Servicing in the warranty period – Restriction issue

Pursuant to the Law on Obligations, the Law on Consumer Protection (as well as the contracts with manufacturers), all purchasers of passenger cars have the right to a 24-month warranty (starting from the date of delivery of the vehicle to the buyer). Commonly, all manufacturers/dealers provide longer-term warranty for color (36 months or more), anti-corrosion protection (8 years and more), and so forth.

Some manufacturers, or their dealers, offer even longer warranty periods to the buyers of new passenger cars (e.g. Dacia for 36 months or 100,000 km, VW, Škoda and Audi for 48 months or 120,000 km, Hyundai, Toyota for 5 years with unlimited mileage, and Kia for 7 years or up to 150,000 km without restrictions on mileage in the first 3 years) or provide the possibility of purchasing an extended warranty[5] under favorable conditions. In the period from 2011 to 2015, out of the total number of new passenger cars sold, around 40-42% were with a two-year warranty, 11-13% with a three-year warranty, about 30% with a four-year warranty, and 14 -16% with a warranty of five years or more.

The warranty implies that repairs and replacement of parts are performed exclusively in authorized service shops[6]. Regardless of the scope of work performed, the right to warranty is lost if the repair and/or service is carried out in unauthorized service shops or outside the service network. In the Republic of Serbia, if consumers want to claim their warranty during the warranty period, servicing and repair of motor vehicles can be performed only with the authorized service providers, and only original spare parts can be installed, which has a strong effect on the level of competition in this market segment. In the EU, following the adoption of the Regulation on Vertical Agreements 330/2010, Block Exemption Regulation 1400/2002 [37], as well as Block Exemption Regulation 461/2010 [5, 11], consumers have been given the freedom to choose where they will maintain their vehicles within the warranty period, which eliminated many earlier restrictions and increased the intensity of competition.

The structure of replacement parts installation and price differences

One of the key issues in the automotive aftermarket which significantly affects the level of competition is the question of replacement parts and their installation. An investigation for the Directorate-General (DG) for Competition of the European Commission suggests that only 20-25% of all replacement parts are produced by motor vehicle manufacturers, while 75-80% are provided by other suppliers [36].

In the EU, original replacement parts are more expensive than those that are not original. In addition to the quality of these parts, this is largely due to the marketing policy of the motor vehicle manufacturers' market, which relies on the differentiation strategy (unlike other

5 The longer duration of the warranties provided by vehicle manufacturers that are used to gain competitive advantage, undoubtedly offer great benefits to motor vehicle owners. However, some independent service providers suggest that it is a form of binding the consumer to perform servicing and repair of vehicles only at authorized service providers for an extended period of time and to use only original replacement parts for this purpose.

6 Observed per individual brands of passenger vehicles, the number of repairers who perform servicing during the warranty period is as follows: Škoda 25, Fiat 17, VW 16, Dacia 17, Hyundai 9, Ford 7, Opel 10, Renault 15, Toyota 9, KIA 8, Peugot 10, Audi 5, BMW 6.

manufacturers that rely primarily on cost-benefit strategy and lower prices). Original parts can only be purchased from the general importer or its authorized dealer (service provider), but there is also a wide range of parts whose characteristics correspond to the original and meet the warranty requirements (e.g. Bosch, Duracell, Febi, Luk, Mann, Narva, SKF, Valeo etc.). It is important to note that the conducted research has not recorded entry barriers related to the provision of technical information related to the purchase of original spare parts. Namely, in the conducted surveys, there are no evidenced restrictions by means of which manufacturers/importers, or representatives, can obstruct the access to the replacement parts that independent service providers need in order to equally compete in the provision of service. On the other hand, only authorized service providers (which have access to special databases, whose employees go through specialized training in order to be able to use them) possess detailed instructions on correct implementation of on-board repairs and debugging specific failures on certain types of vehicles.

The structure of the replacement parts installation is different depending on the type of service. Although the scope of the survey was limited, according to the results, it can be noticed that authorized motor vehicle service providers are much more focused on the installation of original replacement parts than the independent servicers. Intensive circulation of used parts of unknown origin and questionable quality is being highlighted as one of the key issues of the domestic automotive aftermarket.

There are great differences in terms of characteristics of replacement parts that are on offer in the Serbian market. Some of them are produced by the same manufacturers that produce parts for the first installation in motor vehicles and which are of the exact same quality as the original replacement parts (with the exception that they do not have a manufacturer's brand). But a significant share of these parts (in the European market mainly made in Turkey, China or by small local manufacturers) do not possess the characteristics that match the quality of the original replacement parts. In addition, the installation of parts that correspond only to the prescribed physical sizes and are of extremely poor quality (which are sold and installed as replacement) and for which there is a short warranty period (expires after a maximum of 6 months) is not a rare case.

There is a significant difference in the labor price of technicians during the warranty period (with authorized service providers) and a technician who is servicing the product after the expiration of the warranty period (with independent service providers).

According to surveys, there is also a large difference between the price of original spare parts and those that are not original. Considering the estimates provided by the respondents, the price of original replacement parts is on average higher by more than 110% than the conventional, not genuine parts (with this difference ranging from a very wide range of 20% to up to 4 times[7]). There is also a great difference in the price of work between authorized and independent service providers. According to the survey, the cost of man-hour at authorized service providers is on

7 Parts that are cheaper than the genuine ones can not, as a rule, be compared with the original ones in terms of quality and reliability, and yet car owners have often chosen the installation of such parts due to acceptable prices and their poor material status.

Table 4: Structure of the replacement parts installation in 2015 – Authorized and independent motor vehicle service providers (% of total procurement)

Authorized service providers	Original replacement parts	Replacement parts that are not original replacement parts
1. Total	83.00	17.00
2. Regular maintenance (servicing)	84.00	16.00
3. Repairs	78.00	22.00
Independent service providers	Original replacement parts	Replacement parts that are not original replacement parts
1. Total	50.00	50.00
2. Regular maintenance (servicing)	34.00	66.00
3. Repairs	58.00	42.00

Source: Authors' survey

average 80% higher than the price of a service technician who is servicing the product after the expiration of the warranty period (with this difference ranging from 10% to 2.5 times).

Service providers justify the difference in labor costs during the warranty period by the significantly higher investment in standards required by manufacturers (facilities, tools, training, information systems), as well as by the fact that many servicers who service the product after the expiration of the warranty period operate in the gray or black area of the market (meaning that they only partially record and account for parts and employees, do not provide fiscal accounts and do not pay the prescribed taxes and contributions).

Differences in the prices of services of authorized and independent service providers are much higher than in the EU, where they range from 15-20% [8]. However, it should be noted that authorized service providers often carry out individual actions whereby vehicle servicing prices, for a certain period, or for certain types (e.g. for vehicles older than four or five years) are significantly more favorable and almost identical to the prices in independent service providers.

Conclusion

The results of the conducted research on the automotive aftermarket in the Republic of Serbia indicate the following:

- Regarding the intensity of competition, the majority of respondents (100% of authorized distributors surveyed, or 67% of authorized service providers and 75% of surveyed dealers for motor vehicles replacement parts) find that the level of competition in the market is high. At the same time, the key problems that the main stakeholders are facing on the supply side in the domestic market of post-sales services for motor vehicles are, first of all, the presence of unfair competition, as well as the intensive circulation of parts of unknown origin and unverified quality. In addition to the abovementioned, among other things, the respondents also noted the drop in the purchasing power of end consumers, i.e. the decrease in sales margins.
- Regarding the market structure, the respondents estimated that the revenues of authorized service providers in the total generated income in the automotive aftermarket averaged at 45%, that is, the share of independent service providers in total revenues is somewhat higher and amounts to 55%.
- According to the structure of revenues of authorized service providers generated in 2015, servicing and repair of products within the guarantee period participates with 57%, while the share of revenues generated outside the warranty period is slightly lower and it is on average 43%.
- The share of revenues from regular maintenance and repair of motor vehicles in the warranty period in the total generated income in 2015 with independent service providers is 50% on average, approximately the same as during the warranty period.
- On average, 83% of authorized service providers surveyed use only original spare parts while servicing and repairing motor vehicles, which is 33% more compared to the frequency of use of genuine spare parts by the independent service providers.

The challenges in the area of competitive relations in the post-sales services market arise if interbrand competition (competition between manufacturers of different brands and their distributors) is not strong enough, that is, if the manufacturer of a particular brand has a significant market share in comparison with producers of competing brands. In such a case, the manufacturer of certain brands and its distributors are not sufficiently stimulated to offer high-quality service and installation of replacement parts to end customers, despite the fact that they charge a high price for the basic product. Bearing in mind the basic characteristics of the primary market in Serbia, it can be concluded that interbrand competition in the automotive aftermarket is intense and that no significant issues are noticed.

The potential problem in the area of competitive relations in this segment of the market is reflected in the constraints of intrabrand competition (competition between distributors/servicers/replacement part dealers of products of the same brand). The manufacturer is in a position to impose restrictions on distributors in

respect of the terms of their contracts with authorized service providers and spare part dealers, obliging them to install/sell the OEM parts only. Restrictions of this kind are justified only if they provide a higher quality of the after-sales service. Otherwise, they represent a serious distortion of competitive market behavior, since the entry of independent manufacturers of spare parts and repairers in the market is therefore restricted, although they could offer replacement parts of the appropriate quality and the required grade of service and repairs.

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