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KOPAONIK CONSENSUS 2014
CHANGING OURSELVES IN ORDER TO CHANGE SERBIA IN A CHANGING EU

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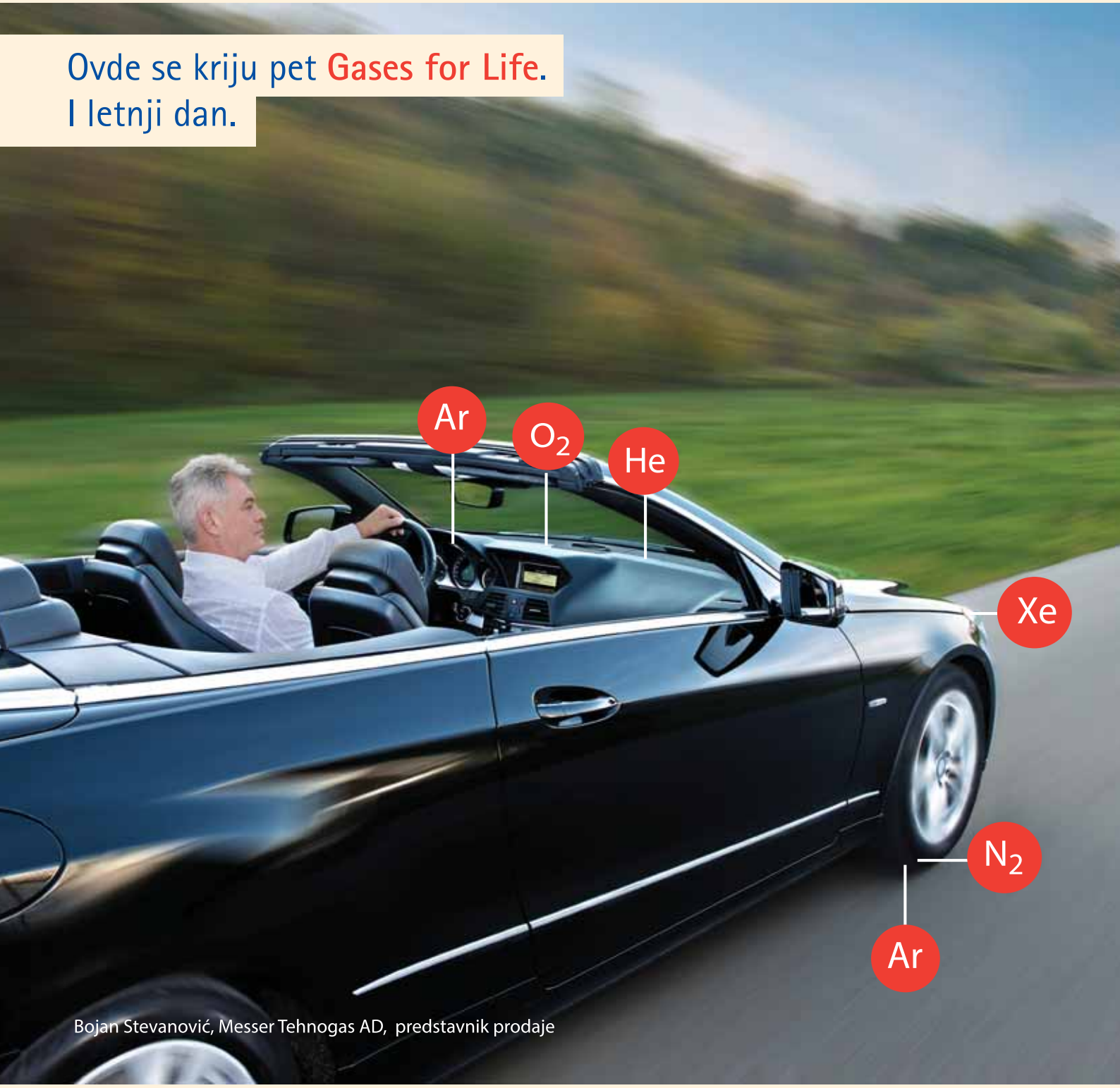

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Web: www.ses.org.rs
E-mail: office@ses.org.rs

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Changing Serbia by changing our mindset was the *leitmotif* of the last *Kopaonik Business Forum* held in March this year. Many ideas presented in the papers in the previous edition of *Ekonomika preduzeća* influenced the flow of discussion at the Forum. As every year, the key conclusions and recommendations were summarized and presented in the *Kopaonik Consensus* document. The actuality of recommendations is proved by, for example, proposed regulation on mandatory natural disaster insurance which could have substantially relaxed the pressure on budget in the case of the latest floods.

Along with *Kopaonik Consensus*, this edition of *Ekonomika Preduzeća* covers different but equally up-to-date topics. The papers are structured in three sections. In *Organization and Management* section, the first paper written by *N. Janićijević* explains three core mistakes of divisional organization of joint stock companies. Namely, the author analyzes how faulty structuring of divisions and centralized functions, imbalance of authority and responsibility, and inefficient system of strategic and business planning undermine the advantages of divisional organizational form and deteriorate its performance.

In the following paper, *Đ. Kaličanin* and *O. Gavrić* review M. Porter's concept of clusters as a form of local association of companies that encourages more efficient use of resources and innovation in order to create value. The authors provide comparative study of successful clusters in the EU countries (Italy and Spain) and Serbia.

The last paper in this section by *V. Dženopoljac* provides the review of numerous research studies done in the Serbia regarding how intellectual capital affects corporate performance in comparison with physical and financial capital. The author underlines the empirical results of these studies showing insufficient impact of intellectual capital on performance of Serbian corporations.

In *Finance* section, *A. Pobrić* explores different concepts of measuring customer profitability in practice. The author endeavors to identify the level of acceptance of various methods, to determine contingent factors that shape the company's need for certain method and to stress the main difficulties in their application.

In the following paper in this section *M. Pepić* presents the hedging strategy based on interest rate futures. With the aim of shedding more light on that issue, the author thoroughly explains how market participants could protect themselves against interest rate risk and highlights the need for developing derivatives market in Serbia.

In the last section covering *Marketing* topics, *Ž. Stojanović* and *J. Filipović* investigate how producers of functional foods comprehend their typical consumers in Western Balkans. The authors emphasize the necessity of strengthening marketing communication for the purpose of better addressing targeted consumers.

The second paper in this section written by *I. Domazet*, *D. Filimonović* and *O. Pantić* deals with Serbia's export competitiveness and possible effects on current account in case of EU accession scenario. The results of the research imply the rise of exports to the EU, but an inevitable fall regarding Russia and the rest of the world. Additionally, the authors provide the evidence in favor of EU accession in terms of overall economic welfare.

Prof. Dragan Đuričin, Editor in Chief

KOPAONIK CONSENSUS 2014

Changing ourselves in order to change Serbia in a changing EU

Background

The start of the EU accession process which marked the beginning of 2014 is a turning point for Serbia that will certainly have the major impact on its economy in the years ahead. Integration into the EU enables the countries with a similar level of income as Serbia to benefit from the so-called "convergence effect".

Today the EU is faced with serious structural crisis that calls for intensified efforts to combat recession and achieve sustainable economic growth through institutional reforms directed toward the Banking Union. However, the 2008- crisis in the EU led Serbia to the state of "crisis within the crisis".

The decrease in FDI and higher costs of attracting investors from the EU are the most obvious manifestations of that reality. As a consequence, at this year's Forum we have identified a paradox that while Serbia becomes politically closer to the EU, its economy is becoming more vulnerable and more distant from the EU trends. Therefore, there is an increasing pressure on politicians in Serbia to take into consideration not only political aspects of the EU integration, but also economic reforms that would help Serbia to catch up with the EU.

Smart government may use the EU as a catalyst of Serbia's reforms. Radical economic reforms are prerequisites for the integration into the EU. In order to be effective, these reforms must follow the so-called "4 Ps" principle in terms of being (1) proactive, (2) professional, (3) predictable, and (4) participative.

Reforms initialization

Before the start of real reforms the zero step would be to find the final solution for companies in restructuring (153 companies) in compliance with the new Privatization Law as well as the new Labor Law. Business controversial companies should either undergo privatization or file for bankruptcy. In case of bankruptcy, the rights of employees should be strictly respected in line with the new Labor Law to ensure social equity and political stability.

Anyway, the real reforms must be initiated at the state level, targeting the state administration and state-owned enterprises.

State administration. The state administration reveals the existence of human resource paradox (too many people with inadequate knowledge and not enough people with the right knowledge). This paradox is largely a consequence of massive employment of political party members as well as the drain of experts due to "stop-and-go" effect after elections. Only professional, small and motivated administration can carry out reforms. Guiding principles of the state administration reform should be: (1) technical expertise in providing potential investors with quick and useful responses, (2) full understanding of the EU regulatory framework,

and (3) performance-based compensation. As is the case with any other job, accumulation of experience as a consequence of continuity of engagement is a core driver of efficiency. In this regard, continuity of engagement of experts is prerequisite for experience curve effect within the ministries and regulatory bodies involving, among others, top level officials.

State-owned enterprises. Apart from the state administration, the so-called "party property" is also widespread in management bodies of state-owned enterprises, especially at the top level. Hiring professional managers (including expatriates and foreigners) is the best way to neutralize the influence of political parties and enable these enterprises to be driven primarily by economic goals. Namely, the primary goal of state-owned enterprises should be to create added value, thus contributing to budget, instead of taking budget to cover their losses. It is necessary to undertake the rightsizing of state-owned enterprises in terms of capital, assets and employees. Bearing in mind their size and importance for the capital market development, the corporatization of state-owned enterprises as well as the introduction of corporate governance are considered the first steps in the right direction.

Scope of reforms

Another aspect of reforms relates to improving the attractiveness of business environment. This is "walking on two legs". The first one is fiscal consolidation, while the second one is energizing growth. This means sustainable growth in the sense that it leads to the increase in national wealth which is accompanied by higher standard of living, but not at the expense of future generations.

Fiscal consolidation. Fiscal discipline could be attained through austerity measures. Austerity means working harder while earning less in order to apply the principle of "hard budget constraint" (expenditures equal revenues). The Fiscal Council should maintain a key role in monitoring the effectiveness of austerity measures.

Economic growth. However, sustainable development based on the real economy growth is an area that remained off the radar of the previous governments. It is therefore advisable to establish the Industrial Policy Council that would be in charge of that issue in the name of the Government.

In order to ensure that the economy stays on the path of sustainable economic development, the Fiscal Council and the Industrial Policy Council should coordinate their activities.

Purpose of reforms

Increasing the density of relevant economic agents to capitalize on multiplicative effect of investments lies at the core of economic reforms. Economic growth should be based not only on FDI but also on joint ventures with state-owned enterprises, particularly those from the sectors of tradable goods and services, according to previously adopted industrial policies.

Industrial policies are formulated for the sectors of vital importance for economic growth and development. Also, infrastructure needs further improvements, which could be financed from loans by international financial organizations and sovereign wealth funds of the countries with immense foreign currency reserves.

The National Bank of Serbia has an ultimate responsibility for the implementation of reforms. Its role must evolve from maintaining the stability of financial system to keeping balance between financial sector and real economy. Accordingly, it is important to align the macroeconomic fundamentals of the system from the domain of monetary policy, such as cost of capital and FX rate, with development goals. There

is no chance of achieving growth and development with overvalued FX rate and double-digit cost of capital.

Role of politicians on the road ahead

Economic risk (unemployment and underemployment) is the main driver of political risk in Serbia.

The role of political leadership in reforms is unavoidable. In a country that in the previous period lost institutions and a significant number of bright people (mainly technocrats due to brain drain) somebody has to take up the role of agent of change.

By taking the lead in reforms politicians must stop politicking and start acting as statesmen and strategists. This means they need to get insight into the actual state of affairs, to have a clear and feasible vision of sustainable development, to connect people and institutions through reforms, to listen to the advice of experts and relevant institutions as well as to be able to understand and implement EU values. Being statesman and strategist is a rather risky venture since its goals are achievable in a time horizon that is longer than a usual political cycle. Orientation toward reforms may be reinforced by adopting a long-term program of reforms in Parliament with time-framed goals set by the Government. The new role of politicians covers the following aspects.

Focus on relevant groups. Reforms must focus on stakeholders which are the main drivers of economic development such as entrepreneurs (not only foreign but also local, and especially young ones), and the unemployed (primarily, the youth). Particular attention should be paid to the education and judiciary system as essential elements of infrastructure that have to ensure the revival of entrepreneurial activities.

Compatibility with the EU. Serbia's reform agenda must be in accordance with the priorities set by Europe 2020 strategy such as sustainable energy, food safety, environment, and economic implications of population aging. In the forthcoming period Serbia needs to return to the growth model based on industrial economy and refocus itself toward the real economy. The success of reindustrialization and competitiveness improvement will largely depend on the compatibility with the EU technological platforms. In this regard, the development of applied science and technological platforms that support tradable sectors competitiveness should come to the fore.

Priority sectors. It is necessary to define the industrial policies for priority sectors in which Serbia has comparative and/or competitive advantage. The most frequently mentioned sectors with comparative advantage are agriculture and agriculture-based food processing industry, energy, manufacturing, infrastructure, and tourism (health tourism in particular). The sectors with competitive advantage include ICT, automotives, logistics, and construction. Industrial policies are implemented not only to enhance sectors of tradable goods and services, but also to eliminate extreme regional disparities.

Recommendations and core idea

This year's Forum has released a number of valuable sector-specific recommendations. For example, the most important proposals for the agricultural sector relate to the Law on Cooperatives, subsidy policy, and expansion of organic production. As far as the energy sector is concerned, it seems worthwhile to establish the Institute for Strategic Studies. Different views about how to deal with NPLs as the major problem burdening the banking sector were also presented. The representatives of the insurance sector exposed the recommendations concerning the introduction of tax reliefs for certain forms of insurance as well as mandatory insurance against natural disasters.

A general impression is that the vast majority of participants came to this year's Forum with the idea of how to fix the system in structural crisis rather than to criticize it. It is in line with the thoughts of Nobel Prize laureate *I. Andric*, who once remarked that "the ability to forget is a true measure of human greatness".

The previous colorfully explains the importance of the Forum as a meeting point for discussion about real economic problems and feasible solutions of Serbia's crisis relevant not only to economic growth but also to political stability. Finally, it is only by taking up the challenge of changing ourselves that we will succeed in changing Serbia in a changing EU, which is the core idea of this year's Forum as well as the answer to the question embodied in the title "Changing Serbia in a Changing Europe".

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Nebojša Janićijević
University of Belgrade
Faculty of Economics
Department of Business Economics and Management, Belgrade

RISKS OF DIVISIONALIZATION: THREE TYPICAL MISTAKES IN THE STRUCTURING OF A DIVISIONALIZED COMPANY[1]

Rizici divizionalizacije: tri tipične greške u strukturiranju divizionalizovanih kompanija

Abstract

The paper analyzes the basic risks in designing and implementing of a divisional organizational model. Divisional organizational model is currently very popular among large and diversified companies since it provides them with a number of advantages. This model enables companies, despite their size, to keep their flexibility and entrepreneurship that are very important in a dynamic business environment. However, divisionalization of companies carries numerous risks of making mistakes, three of which are the most important. The first mistake in designing and implementing of a divisional organizational model is related to incorrect identifying of divisions themselves as well as centralized business functions. The second mistake consists of imbalance in authority and responsibilities of the company and division management. The third mistake in designing and implementing of a divisional model is related to performance standardization as a mechanism for coordination and control of divisions. This mistake consists of either underdeveloped and low-quality, or overdeveloped and bureaucratized system of strategic and business planning through which division performance standardization is operationalized.

Key words: *organization, structure, divisional model, corporation*

Sažetak

U radu se analiziraju osnovni rizici u dizajniranju i primeni divizionalnog modela organizacije. Divizionalni model organizacije je veoma popularan među velikim i diversifikovanim kompanijama jer im omogućuje brojne prednosti. Ovaj model omogućuje da kompanije, i pored svoje veličine, zadrže fleksibilnost i preduzetništvo tako važno u dinamičnim uslovima poslovanja. Međutim, divizionalizacija kompanije nosi i brojne rizike grešaka od kojih su najvažnije tri. Prva greška u dizajnu i primeni divizionalnog modela organizacije vezana je za pogrešno određivanje samih divizija, kao i centralizovanih poslovnih funkcija. Druga greška se sastoji u disbalansu u nadležnostima i odgovornostima kompanijskog i divizionalnog menadžmenta. Treća greška u dizajnu i primeni divizionalnog modela vezana je za standardizaciju performansi kao mehanizam kordinacije i kontrole divizija. Ova greška se sastoji u nedovoljno razvijenom i kvalitetnom, ili preterano razvijenom i birokratizovanom sistemu strateškog i biznis planiranja kroz koji se operacionalizuje standardizacija performansi divizija.

Ključne reči: *organizacija, struktura, divizionalni model, korporacija*

Introduction

Divisional model of organization of a company is, among all models, certainly the one mostly referred to in both academic and popular literature. And there are two good reasons for this. First, divisional model of organization is implemented by all large, thriving and well-known companies. General Motors, General Electric, IBM, Microsoft, Nestle and many other large and profitable companies

1 The paper is the result of the research project "Contemporary Management and Marketing Methods in Improving Competitiveness of Companies in Serbia in the Process of its Integration in the European Union", financed by the Ministry of education, science and technological development

around the world are organized according to a divisional model. Serbia is no exception, so Delta, Sintelon, NIS and many other large and successful companies in Serbia are organized divisionally. Since such companies draw the attention of both academic researchers and journalists, it is no wonder that by exploring these companies and by writing about them they also indirectly write about the divisional organizational model. The second reason for the popularity of divisional organizational model lies in the fact that it is a very complex, multidimensional and intriguing model of organizational structure. It is the only model of organizational structure with three layers of organizational structure: company, divisional, and functional. Practically, it is about organizational framework which contains several independent organizations, since in this model divisions are some kind of *mini companies*. Divisionally organized companies function as a set of more or less interconnected, autonomous divisions, which in itself represents a challenge to both the management of such companies and organizations, and management researchers. Therefore, designing and implementing of a divisional organizational model requires vast knowledge and experience of a company's management. Then, it is no wonder that this organizational model is built only when a company reaches certain maturity.

The complexity of divisional organizational model is precisely the source of its *sensitivity* to making mistakes. Since it is multidimensional and complex, divisional model is not easy to build, and it is even harder to manage. The possibility of making mistakes while setting up a divisional organization is very high comparing to other organizational models [9]. In addition, even when a divisional model of company organization is well established at the beginning, there is always the risk of mistakes occurring during its exploitation and also the risk of deviating from the set-up divisional organizational model.

Each organizational model has some advantages [8]. Bureaucratic model of organization lowers the costs and makes the company's business operations reliable. Simple organizational model brings flexibility, while adhocracy model brings innovativeness in a sophisticated technological environment. Professional organizational model ensures development of experts. Divisional model ensures entrepreneurship, dynamics, flexibility, and innovativeness in a large company, and that is not at all simple. It makes all of this possible by enabling divisions, that is, the divisions' management, to express their entrepreneurship within the limits of their limited autonomy, but at the same not at the expense of the corporation as a whole. In addition, divisional model enables a company to manage its own size, and it also enables very large organizations to still function as a whole.

Divisional model of organizational structure has three key characteristics, or elements [9]. First, it implies that primary organizational units, or divisions, are set according to the market principle, so that each division covers a specific market segment. In addition, divisions should be autonomous, and in order for that to be accomplished, the divisions' interdependence as well as the transactions between them should be minimized. Divisions have either full or limited spectrum of business functions at their disposal, which can, but do not have to be concentrated at the corporation top as well [6]. Second, in divisional organizational model, authority and responsibility are finely and sensitively divided between corporation top and divisional management according to the line of strategic – operational decision-making [5]. Third, coordination and control of divisions in this organizational model is done through a developed system of strategic and business planning [8]. In any of these three dimensions of divisional model, its creators can make a mistake, and any of these mistakes can neutralize the key advantage of divisional organizational model: entrepreneurship and flexibility. Divisions, as well as business functions within them and at the corporate top, could be faulty structured, whereby the autonomy of divisions is directly compromised. Fine-tuned and sensitive balance of authority and responsibility established between strategic corporation top and operative division management can be easily disturbed, whereby, again, entrepreneurship and flexibility of divisions are impaired. Finally, the strategic and business planning system can be faulty set up or become ineffective in the process of work, so that the coordination and control of divisions are not conducted efficiently. Unfortunately, all three of these mistakes are interconnected and one leads to another. Thus, it can sometimes happen at any time

that a well-organized divisional company *slips into* either centralized bureaucracy or anarchy and disintegration [9]. In both cases, the main advantages of divisional organization are lost. The aim of this paper is to present the main risks in divisional organization structuring and point to the way in which these risks can be avoided.

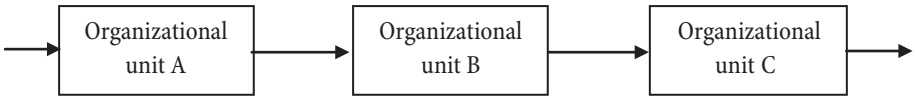
The first risk: Faulty structuring of divisions and centralized functions

The first one of the three key divisional organizational model dimensions is the structuring of macro organizational units. In this organizational model, there are two types of macro organizational units: divisions and centralized functions [10]. The risk of making mistakes while structuring a divisionalized company exists during both the process of organizing the divisions and the process of organizing the centralized functions.

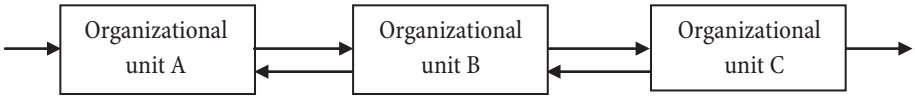
One of the key characteristics of divisional model of organizational structure is market grouping of macro organizational units [9]. These units are usually called divisions, hence the name of the organizational model. Most of large companies apply the development strategy of diversification, and due to this fact enter several different markets. Diversification is in fact the precondition for divisionalization, since only when it is diversified the company is being forced to be divisionalized as well [2]. With respect to organizational aspect, diversified companies must dedicate one division to each of the market segments they do business in, which will handle business operations at that particular market and which will be responsible for the company's performance within it [3]. In order for this to be possible, three requirements regarding the organizational units grouping must be met. First, divisions should be formed based on a market segment that is clearly singled out, and only one division should be present in a particular segment. Market segment, and thereby the division dedicated to it, can be differentiated based on a product, territory, or types of buyers [4]. Second, divisions should incorporate within themselves all, or almost all, operative functions necessary to meet the buyers' needs in the specific market segment they are in charge of. Third, divisions should not be interdependent and should have no or minimum transactions between them. Therefore, divisional model functions best when divisions are complete, autonomous and independent wholes. In order to make this possible, organizational units must be grouped in such a way that a so-called interdependence exists. Namely, there can be three types of interdependence between organizational units (see Figure 1): sequential, reciprocal, and pooled [4].

Figure 1: Types of interdependence between organizational units

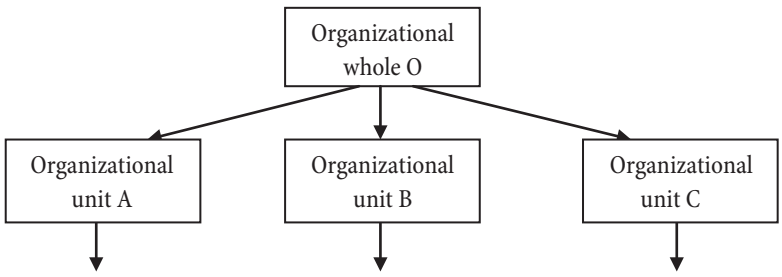
a. Sequential interdependence of organizational units



b. Reciprocal interdependence of organizational units



c. Pooled interdependence of organizational units



Sequential interdependence of organizational units exists when the units are connected in a chain in such a way that the output of one organizational unit is at the same time the input of the next unit, and its output is at the same time the input of the another unit, and so on all the way to the last unit in the chain whose output leaves the frame of organizational whole in which the units are contained. Reciprocal interdependence exists when the output of one organizational unit is the input of the next unit, but the output of that unit is also the input of the preceding unit. Pooled interdependence exists when organizational units do not exchange any products, information or services among themselves, but only share mutual resources of wider organizational whole. Each organizational unit acquires resources either directly from its surrounding or from company management, while outputs of all organizational units are placed directly outside of organizational whole in which the units are situated.

Why is it important for pooled interdependence to exist between divisions? Because divisional model is based on the fact that division management has the authority to independently manage business operations of its division, but is also responsible for the performance the division achieves. In order for this to be possible, division must acquire all or a large majority of material, financial or human resources from external market, and also place all or a large majority of the products and services it produces to the external market. If significant amount of sequential or reciprocal transactions were to exist between divisions, it would not be possible for the divisions to be autonomous operative units, their management could not be assigned with the authority to lead the business operations and, therefore, it would not be possible to control them by means of performance standardization, which is a prerequisite for building a divisional model. Transactions between divisions are not liable to external evaluation by the market, but they are liable to internal evaluation by the company' management and divisional managers, which jeopardizes their objectivity, and thereby also the division performance evaluation based on which the divisions are controlled. Internal transactions between divisions are conducted according to the so-called transaction prices which are liable to subjective influences, power relations, and lobbying, so they often contain unjustified cost that the external market would not acknowledge. In addition, stronger connections between divisions impose the need for them to be harmonized in daily business operations. This harmonization cannot be achieved by using performance standardization, but it must be done by means of some other coordination mechanisms, such as direct monitoring or standardization of processes. This would in turn prevent the building of a genuine divisional model. The whole point of divisional model is precisely to avoid mutual adjustment of the work of divisions, which is not possible in the case of their sequential and reciprocal connection. This is why pooled connectedness of organizational units is the main precondition for building a divisional organizational model. If significant sequential or reciprocal interdependence between organizational units exist, the company should not be organized according to divisional model.

In practice, however, situation is never as clear as it is in theory. There are numerous situations where there are certain sequential or reciprocal connections between organizational units, but still their pooled connectedness dominates. Consequently, organizational units acquire most inputs from external market to which they also place most of the outputs. However, one part of inputs is indeed acquired from other organizational units as well, while at the same time it is also possible to place one portion of the outputs to other units. In such situations there is always a dilemma: Are the transactions between the units so significant that it will disable the functioning of the divisional model? The answer to this dilemma can be given only through the evaluation by the company's management. The common sense rule is that divisional organizational model should not be built if the mutual transactions between divisions exceed 30% of their total transactions.

Many companies have made this mistake because they have, in the situation of sequential or even reciprocal interdependence of organizational units, turned these units into divisions and thus built a divisional model. In that case, most divisions have not been placing their products or services to an external market, but they have been "selling" them at the transactional prices on internal market to other divisions. These division prices

are mostly formed by "cost-plus" method of pricing in such a way that divisions add their total, both justified and unjustified, costs to a certain profit percentage. Trade at such prices leads to the situation where all the divisions are *profitable* except the one that must actually go into external market with its products or services, and the market, unless monopolized, does not accept these products or services at such inflated prices. In addition, intensive exchange between divisions usually gives rise to the need for company top to get involved into regulating divisional relationships. This *interventionism* from the top kills every kind of autonomy of divisions, and thereby also their initiative, entrepreneurship and accountability for the results, which is the very essence of divisional organizational model. Eventually, these divisions are turned into a mere production plants with a divisional manager at the head who is responsible only for fulfilling the production plan.

Besides divisions, centralized functions are a separate and a very important question of structuring in divisional model [11]. Centralized functions are the functions that are performed jointly for all the divisions and are therefore centralized at the company top. The selection of business functions to be centralized carries another risk of making a mistake in divisional organizational model building. Namely, the theoretical divisional structure model implies that divisions have all the business functions necessary for normal conducing of business operations: supply, production, sales, finances, accounting, logistics, human resources management, IT, maintenance, quality assurance, etc. Managers of all business functions are directly subordinate to divisional manager. All business functions within divisions need to be performed fully in order for divisions to be able to function normally and to be held accountable, by the corporation management, for business results that the corporation makes in a specific market segment. In that case, the company management deals with their divisions' investment portfolio management [6]. Divisions have no points of contact, because they do not even share joint business functions. This is a clear situation, so this type of divisional model of organizational structure is called *pure divisional model*. But, this type of divisional model can be found much more rarely than the one usually called *mixed divisional model*. In mixed divisional model of organizational structure, divisions do not separately perform all the business functions they need, but some business functions are centralized and performed at one place for all the divisions. In that case, centralized functions are subordinated to the company management, that is, the centralized function manager is directly subordinate to the company's president. The reason for this modification of the basic divisional organizational model is obvious. By centralized performing of some business functions, several important advantages can be gained [5]. First, resources can be economized. For example, instead of each of the ten divisions having its own human resources management sector with five employees each, which gives a total of 50 employees, a centralized function of human resources management can effectively perform these tasks for all divisions with much less employees. It is not only human resources that are hereby economized, but material resources as well, so the costs of this function are in general from the perspective of the entire company certainly lower. The second very important advantage of the centralization of functions is a higher quality of performing of their tasks. By concentrating experts for certain function at the level of the entire company, instead of dispersing them throughout divisions, a critical mass of competent people is created, who can execute certain tasks with a higher quality performance and develop the function in question. Finally, business functions performance quality and control is facilitated when they are centralized at the company top. However, centralization of business functions at the company top also has some disadvantages [5]. The most important weakness of this solution is that it directly jeopardizes the very fundamentals of divisional structure concept and poses a threat to gaining the primary advantages of this organizational model. Namely, when some business functions, such as human resources management, finances, or IT function, are drawn from divisions and set at the level of company, both division authority and division responsibility for its business performance are decreasing. If division management does not have the control over all the business functions of the division, then it cannot fully manage the business and, consequently, cannot be held

fully accountable for the division performance, which is the basic idea of divisional organizational model. And, the more centralized functions there are, the more the autonomy of divisions is impaired, and the organization is moving further away from divisional model and is returning to functionally organized bureaucracy. In more extreme cases, divisional model turns into a hybrid that is somewhere between divisional and bureaucratic organization [9]. Such is the case when, for example, division performs only production business functions and the related tasks, such as maintenance, quality assurance or engineering, while all other functions, including commercial, financial, and marketing function, are dealt with at the company level. Another disadvantage of the centralization of business functions is complicating the relations within the company, and especially between divisions and centralized functions [7]. The first question that arises is that of financing the work of centralized functions. Since divisions are responsible for the profit, and centralized functions perform certain tasks for the divisions, it is only logical that the divisions finance the work of centralized functions and treat that cost as a business operations expense. However, numerous problems arise in this respect, starting from determining the real cost of centralized functions, to determining the real percentage of divisions' participation in covering these costs. In addition, in divisions-centralized functions relation, problems occur regarding the conducting of work and tasks of these functions, since divisions are often dissatisfied with the quality and promptness of services delivered by centralized functions. Tensions in relations between divisions and centralized functions lead the company management into a situation to be an arbiter and to solve their conflicts, which additionally impairs the autonomy of divisions. The consequence of the described tensions is the tendency of divisions to perform those tasks themselves, despite the existence of centralized functions. Thus, for example, despite the existence of company IT department, IT experts are also employed in divisions and thus divisions' IT departments slowly round up, which should ensure that the divisions are not dependent on the centralized IT department while performing IT tasks. This, of course, doubles the resources and additionally decreases the economic effectiveness of divisional model of organizing a company.

For the success of divisional model, a proper selection of centralized functions is very important [5]. If business functions that should not be centralized get centralized, divisions will not be able to fundamentally influence their business performance and so they will not be responsible for them. Excessive centralization of functions at corporate level *deprives* divisions of their business functions, and then they turn into mere production or service plants. On the other hand, missing the opportunity to gain all of the described advantages by means of business functions centralization also endangers divisional organizational model and its effectiveness. In this regard, there is one very important question: Which business functions should be centralized in divisional model? Experience shows that the following business function should be centralized: human resources management, research and development (R&D), IT, public relations (PR), legal duties, corporate finances, and planning and controlling [6]. Will some business function be a candidate for centralization, it depends on numerous factors, but the most important one is the following: will this centralization enable leverage; that is, will it enable economically effective resources management and higher quality of task performance? This will in turn depend on the nature of the division's activity. If divisions are in the same technical-technological sphere, it makes sense to centralize the resources for performing research and development activities, but if they are not in the same sphere, then there is no need for centralization. Also, if the business activities that divisions engage in are such that they require homogenous workforce, then it does make sense that the activities of selection, recruitment, training, and development are performed in a centralized function of human resources management instead of every division performing it by itself. Will a business function be centralized and which one will be centralized, it depends on the management style practiced by the company management [6]. If company top management deals exclusively with business/divisions portfolio management and strives to be the least involved in the work of divisional managers, then business functions centralization does not exist at all or it would be minimal. However, if the company

management wishes to be included in and influence the work of divisions as much as possible, then a larger number of business functions are usually centralized. In that case, among other numerous roles, company management also plays the role of centralized services provider.

Many companies make a mistake in the selection of centralized business functions, so they centralize the functions that should not be centralized, and do not centralize the functions that should. The author's experience in structuring of companies in Serbia speaks in favor of the thesis that centralizing too many business functions at the company top is a more common mistake. The reason for this is a very prominent general tendency of managers in Serbia to centralize the management. By unnecessary centralizing some business functions, it is not only that autonomy of divisions is impaired and the main advantages of divisional model are jeopardized, but these centralized functions push the company into bureaucracy and unresponsiveness to the divisions' needs. Divisions then naturally react and form their own business functions that they need, whereby the economic effectiveness of business operations is additionally jeopardized.

The second risk: The imbalance of authority and responsibility between headquarters and divisional managers

The second dimension of divisional companies organizing that is very different comparing to all other organizational models is the delegation of authority. In divisional organizational model, there is a limited vertical decentralization [9]. Company headquarters have kept the authority of strategic decision-making, while authority of operative decision-making is delegated to divisional managers. In that way, the authority and the responsibility have been divided between managers, which enabled the management at the strategic level of the company to concentrate their attention to development and strategic issues, while divisions' managers deal with operative business activities. Thereby the problem of the "congestion at the top" has been overcome, which exists in all large centralized organizations and which emerges due to lack of capacity of the top management in large and complex companies to reach numerous operative decisions and deal with everyday problems. By decentralization of authority, large companies overcome the main barrier to growth and can continue to grow; hence, almost all very large companies in the world have implemented the divisional model. When a company becomes so large that it cannot be managed from one center, then several smaller units are created in which the authority for operational decision making is delegated, so the whole company can function effectively. By decentralization of authority, divisions have also gained certain autonomy, so that they function as relatively autonomous organizational units. Thereby a possibility is created that the divisional managers and employees to be fully demonstrate their initiative, entrepreneurship, and capabilities. Divisional managers can then freely run business operations of the company in the way they think is the best as long as they operate within the frames of growth strategy of the company and as long as they show results.

Since delegation of authority in divisional model is based on a strict division of the roles between strategic top management and divisional managers [8], it is very important to identify the content of these roles. The company headquarters should assume the following roles [5], [9], [11]:

- *Formulation and implementation of company growth strategy*. The strategic company top has the authority and responsibility to formulate and implement the company growth strategy. Company growth strategy determines the direction, the tempo and the method in which company will grow and develop. This strategy shows in which businesses the company will engage in business activities. This role implies that the company top will develop the strategic plan of company growth and then enable its implementation. In this role, the strategic top of the company actually manages the strategic portfolio of businesses and divisions by investing or divesting in them. The company top decides in which businesses the company will engage in business activities, and based on that decision invests the capital in one and divests in other businesses. In addition, the strategic company

top establishes or buys new divisions, and shuts down or sells the existing ones.

- *Evaluation and approval of divisions' competitive strategy and business plans*. The strategic company top of a divisionalized company does not create, but it does evaluate and approve (authorize) divisions' competitive or business strategies. Competitive or business strategy shows how a division will beat the competition in the market area in which it operates. It can accomplish that in three basic ways: become a cost leader, through differentiation, and by focusing. Divisions' competitive strategies are formulated by divisional managers, and business plans emerge as a result of this activity. It is critical that divisional managers have the autonomy to independently formulate business strategy. But, since they are a part of a wider system, it is not possible that these strategies are reached without company top being aware of them and without being able to evaluate, correct and approve of them.
- *Divisions' performances control*. In divisional organizational model, standardization of results is the basic mechanism for coordination and control. Therefore, company strategic top must build a system which provides the information about divisional performance, analyze that information, and take corrective measures if necessary. It is common that divisional performances are controlled with respect to the planned performances contained in the previously approved business plan. It is essential that corporation management has real information regarding divisional performances. In addition, this does not apply only to financial performance, although they are traditionally the most important ones and are of the most interest to the strategic company top. Aside from financial performance, company management collects, analyzes and evaluates the information regarding divisions' performances on the market (sales, market share), technology performances, human resources management, etc. When divisional performances do not satisfy the company top management criteria, that is, when divisions do not fulfill the set business plan, the strategic company top management actually has two options that depend on the evaluation of the cause of the dissatisfactory performance. If they assess that poor performances of divisions are the result of objective circumstances (bad market conjuncture, a new competitor entering the market, and the like), the strategic company top may react by helping divisional management in all sorts of ways (by financial injection, for example). But, if the company top concludes that poor performances of divisions are the result of the poor work of divisional management, then the consequence is clear – dismissal of divisional management. The only thing that the strategic company top should not do in the case of poor divisional performances is to get, through its decisions, personally involved into divisions' business operations; for example, by personally reaching a decision to change some product, sales channel, marketing strategy, etc.
- *Financial resources allocation*. The practice of most divisionalized companies is to accumulate at the company level the profit gained at the divisional level, and then invest in different purposes through decisions reached by the company strategic management. In other words, the strategic company top reallocates the financial resources by extracting more financial assets from some divisions than it invests in them (the *cash cows* in BCG matrix), while doing exactly the opposite in some other divisions (the *stars* in BCG matrix). This is one of the reasons why divisionalized companies are so vital, because this kind of reallocation ensures that financial resources are always invested in those branches or businesses that are the most promising ones at the given moment.
- *Development and implementation of systems in a company*. Divisional organizational model is burdened by the existence of permanent centrifugal forces whose carriers are divisional managers. Wishing to capture as large portion of autonomy as possible with respect to the company top, they can seriously jeopardize the unity of a divisionalized company. In order to provide this unity, the company top creates

and implements uniform systems of operations in all the divisions. A uniform IT system, system of rewards, employees' evaluation system, planning system, quality system, and especially divisions' performances control system are actually the *glue* that holds the company together. If all divisions must in the same way handle planning process, human resources management, quality assurance and the like, they will function as one whole. Creators of uniform systems of centralized functions are usually at the company top.

- *Defining the mission, vision and culture of the company.* Uniform systems are the *hard glue* that keeps a divisionalized company together. The *soft glue* is mission, vision, and organizational culture, that is, the shared values. Although intangible, vision or values sometimes keep the divisions closer together than different kinds of formal systems. The role and the responsibility of the strategic company top are to formalize and communicate the mission and the vision of the company as a whole, but also a set of shared values held at the level of the entire company. This is, after all, by definition the responsibility of the company leader and top management. This is not an easy task, since it is difficult to build a strong organizational culture as well as to provide the acceptance and implementation of a uniform mission and vision. But, when all employees and managers in divisions believe in the same mission, vision and the same values, it will be no problem to coordinate and control them, and the entire company will behave as a single organism.
- *Appointing, dismissing and rewarding of divisional managers*. Corporate top has the authority to select divisional managers, so this is another mechanism of their control. Thus, a possible solo act of divisional managers is prevented and the power of centrifugal forces tending to disintegrate a divisionalized company is diminished. Knowing that his/her position depends on the company top management's decision, the divisional manager will strive to fulfill the requirements of this authority thorough his/her work. It is common practice that company top rewards divisions' managers. The managers' bonuses directly depend on the decision of the company top. Finally, when it estimates that the incompetence of a divisional manager has led to the division's poor performance, the company top can punish the manager (which happens rarely) or replace or dismiss him/her (which happens more often).
- *Divisions operations monitoring and interventions*. The strategic company top often assigns itself with a task to personally monitor and control the work of divisions, outside of the frames of regular divisions performances control system. This is because the strategic company top must not wait for the periodic report on divisions' business operations, but must react as soon as a problem in their business operations is discovered. In addition, formalized divisions' performance control systems are sometimes not very sophisticated and precise, so some important signals implying the occurrence of possible problems in divisions' business operations sometimes cannot be noticed just by relying on the said systems. This is the reason why company top managers visit the divisions or summon divisional managers for meetings in order to get informed through direct communication about the divisions and their performances.
- *Providing centralized service*. Company top has the role of providing centralized services, since the centralized business functions that provide these services are under a direct control of company management. The company management must provide responsiveness of the centralized functions according to divisions' needs on the one hand, as well as the discipline of the divisions in financing of the centralized functions, on the other.
- *Regulation of interrelationships between divisions*. It was already stated that divisional model implies having no or minimum transactions between divisions, that is, their pooled interconnectedness. In practice, however, it is relatively often the case that, aside from pooled interconnectedness, there is also reciprocal and sequential interconnectedness of

divisions, so in such cases certain interactions and transactions do occur between divisions. When one division sells some products or services to another division, then this raises the issue of transactional or internal prices of this sale. In such transactions, certain discrepancies, and even conflicts, often emerge between divisions. All these problems must be solved by the company top, and this is precisely its obligation. The company top must be some kind of arbiter that all the divisions turn to in order to solve their relationships.

The role of divisional managers is to operatively run the business in divisions and achieve the expected results. Divisional managers should therefore have the authority to independently make all the decisions within the operational management sphere that do not concern the interests of other divisions. It is common practice that the authority and responsibility of divisional managers spread in the following spheres [5], [9], [11]:

- *Formulation and implementation of competitive division strategy*. Divisional managers formulate the strategy of fighting the competition in their area of business. When strategic company top approves the strategy, divisional managers implement it independently. Once approved, competitive strategy becomes the foundation for the work of divisional manager, who then have total autonomy in its implementation.
- *Formulation and implementation of division's business plan*. Divisions formulate a business plan draft in which they project the goals that the division will achieve within one year in its area of business as well as the resources needed for achieving of the projected goals. The company top management approves the division's business plan with or without previously modifying it. Once approved, business plan becomes the framework for the work of divisional management, and they do not have to seek further approval from the company top management for the decisions that are within the framework of the approved business plan. Therefore, divisional manager has the authority and responsibility to make all the decisions and take all the actions that are within the framework and in accordance with the business plan.
- *Operational division management*. Divisional management has total autonomy in divisions' business functions. Thus, in the production sphere, the divisional manager together with his colleagues, and primarily with the production manager, independently makes the decisions regarding the selection of technology, technical solutions, equipment maintenance tactics and strategy, raw materials and supplies, spatial organization of production, production time cycles, etc. In the domain of finances, divisional manager independently plans and implements cash flows, provision of funding resources within the framework of the business plan, placement of financial assets (investing) within the framework of the business plan, collecting of receivables, as well as payments of liabilities, etc. In the marketing sphere, divisional management has the authority to choose suppliers, as well as sales channels, to conduct products pricing, to formulate and conduct the advertising strategy and sales promotion strategy, etc. This authority can be denied in special cases when procurement is centralized, for example, in order to attain a better negotiating position with respect to suppliers. Divisional manger independently suggests the number of employees in the division, which becomes part of his/her business plan. Upon the business plan approval, the divisional manager can independently make decisions on hiring or firing the employees. Divisional manger rewards or penalizes the lower level managers and employees in the division, of course, in accordance with the system of rewards usually designed at the strategic company top. Divisional manager has the authority and the responsibility to create macro and micro organizational structure of the division; he/she creates the organizational scheme and approves of job systematization and job descriptions.

The described division of the roles, authorities and responsibilities between the strategic company top management and the divisional management in divisional

model is general in character. In each individual case, in each particular company, this division of authority between the two levels of decision-making can be modified and adjusted to the specific circumstances of the given company. Some of the circumstances are objective in character, such as, for example, the number of divisions, their interconnectedness (pooled, sequential or reciprocal), technology, market structure, etc. Some of the factors that impact the division of roles in divisional companies' management are purely subjective: the leadership style of the corporate top and personal orientation of corporate managers, the level of competencies of divisional managers, the company cultural values, tradition and history, etc. Therefore, the described division of authority and responsibility between corporate top management and divisional management provides enough space to demonstrate very different styles of divisionalized company management within it [6].

Divisional model is very sensitive and unstable; hence, its survival depends on the division of roles between strategic and operative management. The risk of imbalance in the delegation of authority and responsibility between corporate top and operative management hangs over a divisionalized company like the Sword of Damocles. The roles of strategic and operative management should not be confused, because it would jeopardize the very idea of divisional model of organizational structure and all the advantages that it has to offer. The division of roles between strategic and operative management enables to increase the capacity of company top strategic management on the one hand while, on the other, the space is being freed at the same time to manifest entrepreneurship of divisional management. If the two groups of managers, the company management and the divisional management, do not stick to this division of roles, then none of the two key advantages of divisional model will be exploited. When the strategic top management embarks upon operative management of divisions by impacting their everyday operative decisions or solving their operative problems, then it has neither time nor space left to deal with the strategic problems of the company, which is very dangerous for the company's survival and development. On the other hand, this at the same time makes the divisional managers passive, and they then express no entrepreneurship, initiative, or independence. In that case, divisional model can easily slip into a model of complex centralized bureaucratic organization. Another mistake is to let divisional management take over too high d of authority and independence in decision-making, while the strategic company top *abdicates* not performing the role of strategic management. In that case, divisionally structured company turns into a set of independent companies. This is why sticking to a strict division of roles and areas of authority and responsibility between the strategic company top and divisional managers is crucial for the success of divisional model of organization.

The third risk: Inefficient system of strategic and business planning

Performance standardization is the basic mechanism of coordination and control in divisional model of organizational structure [9]. It is realized through the processes of strategic and business planning. For the purpose of divisions' coordination and control, a direct monitoring by top management, and even work process standardization, can also be implemented in a smaller degree along with performance standardization. But, for divisional model success, it is crucial that performance standardization becomes the primary method of divisions' coordinating and controlling. Otherwise, divisional model makes no sense, all of its advantages perish, and it slowly turns into some other model of organization, such as, for example, bureaucratic model.

The main idea of performance standardization is not to prescribe in advance the decisions and actions of individuals and organizational units, but to control the consequences of these decisions and actions, that is, the performance that emerge as their result. Therefore, performance standardization implies a high autonomy of organizational units, such as divisions. Performance standardization is important for divisional model, because it is only this mechanism of coordination that enables autonomy of divisions and manifestation of entrepreneurship within them, and also the already described division of roles between strategic and divisional management in

company management. Performance standardization is, on the other hand, enabled by vertical delegation of authority, as well as by pooled interconnectedness of divisions. Decision-making centralization at the strategic company top, as well as transactions between divisions, could to a large degree disable performance standardization as a coordination mechanism and make it ineffective.

Performance standardization implies that the strategic company top prescribes in advance what performances are expected from divisions and then lets the divisions' management determine how the prescribed performances will be achieved [9]. The strategic company top should not (at least not to larger extent) get involved in business operations of divisions through which they achieve the required results. The company top should only prescribe what kind of results they expect from a division, and then monitor and control if they are being achieved. Performances that are standardized are mainly financial in nature (profits, ROI, revenues), but they are also of market nature (sales, market share, etc.). The success or failure in achieving the prescribed performance directly affects the rewards and penalties, promotion or dismissal of divisional managers. Those who constantly achieve the prescribed performances are being rewarded and promoted, while others are being penalized and, eventually, dismissed. But, in practice, different styles of managing a divisionalized company can be observed. In some companies, the strategic company top is somewhat more involved in the process of formulation and implementation of operative plans and competitive strategies at divisional level; hence, they also take some part of the responsibility for divisions' results. In such companies, performance standards prescribed for divisions are not as strict, and they are more just guidelines for the divisional managers' work than some clearly defined figures that must be achieved. On the other hand, there are divisional companies in which the strategic company top only prescribes the expected performance and then waits if they would be achieved, being completely uninterested in the work of the divisions. There are numerous varieties between these two opposite styles of divisional company management [6].

Performance standardization as a mechanism of coordination and control is operationalized through strategic and, especially, business plans [8]. The strategic company top formulates growth strategy and makes company strategic plans, usually in a time horizon lasting three to five years. These plans determine in which business area the company will operate in the period that lies ahead, at what pace and in which way it will grow and develop. Strategic plans also determine the company investments within the following period, so investments plans are actually a part of the company strategic plan. In accordance with the strategic plan, as well as with the financial, market, technological, and human resources at their disposal, divisions suggest business plans for the period of one year. The company strategic plan is operationalized through these plans. A division business plan should, in simple way, predict the total business operations of the division for the period of one year, resources needed for the business operations, as well as the results that can be expected. Business plan estimates the sales according to products and markets, production quantity, procurement of the needed supplies, raw materials and energy, and financial and human resources needed to achieve the desired performance. Business plan also specifies the results that the division will accomplish and expresses them in financial measurements: revenue, profit, etc. When divisional management submits a business plan, it is analyzed, evaluated, modified if necessary, and approved by company top management. To what extent the strategic company top will immerse in the divisional business plans subject matter, and to what extent they will modify the said plans, it all depends on the management style of the strategic company top. In some companies, divisions business plans are automatically approved, while in other companies they are the subject of a long-lasting process of analysis in which, after many iterations, strategic and divisional management's opinion are finally reconciled. Once approved, the business plan becomes the framework for divisions' business operations. For the success of divisional model, it is essential that divisional management has the autonomy in the business plan realization. As long as a decision of divisional management stays within the framework of the approved business plan, they do not have to ask the strategic company top to approve of the said decision. Divisional management has the authority

to make all the decisions and take all the actions needed to execute the business plan.

In order to be able to implement the performance standardization, it is necessary that, in terms of centers of responsibility, divisions are profit centers. Therefore, divisions as organizational units should be responsible for the profit they make. In order for that to be possible, three conditions must be fulfilled. First, divisional management should have the authority to decide about both inputs and outputs of its division, because only in that way it can influence the profit that it is responsible for. Second, in order for divisions to be profit centers, it is necessary that accounting and information systems provide precise and accurate allocation of revenues and expenditures per division. This is not always simple, especially when expenditures are concerned, because it raises the issue of divisions' participation in covering the mutual expenses of the company top and centralized functions. Third, it is necessary to correctly determine the so-called internal, or transfer, prices. These are the prices that divisions use to exchange products or services among themselves in cases when sequential or reciprocal relations exist between the divisions. This is important because the total revenue of a division is the consequence of not only its sales at the external market, but also of its sales to other divisions (at the internal market). This is why division's revenue, and even other division's performances, depends of objectivity of internal prices.

In the sphere of coordination and control of divisions, companies often make two types of mistakes that are opposite in nature and character. The first mistake concerns insufficiently developed system of strategic and business planning, and the second mistakes concerns excessively developed system of strategic and business planning. The underdeveloped strategic planning system results in the absence of or a poor quality, clarity, and precision of strategic plans. In that case, confusion and perplexity dominate the company's mission, vision and goals, the strategic orientation of company development, and the company's priorities. Divisions do not have clear instructions from the company top about drafting of the business plans. The differences in interpretation of the development orientation can easily emerge, and even conflicts, tensions and frictions between divisions. Divisions' managers, who feel that they have no clear guidance from the top, can decide to pursue a solo act and maximize their own autonomy, which altogether leads to disintegration of the company. If business plans are underdeveloped, of poor quality, unclear, and imprecise, then control of the divisions' work will be disabled. Simply put, it will not be possible to precisely determine the success or failure of a division since the planned performances, whose comparison to the achieved performance provides the evaluation of division's success, are not reliable enough. If insufficiently sophisticated methods and wrong evaluations and forecasts are used to draft a business plan, if business plans do not contain some relevant elements, if transfer prices are determined in the wrong way, and if allocation of mutual expenditures to divisions is wrong, then these plans will be defective. Such business plans will not be a reliable support for the control and coordination of the divisions' work. Top management will soon realize that they cannot rely on business plans to control the divisions' work, so instead through performance standardization, they will control the divisions' work by means of direct monitoring. This will destroy the autonomy of divisions and turn divisional model into a centralized organization.

On the other hand, it is often the case in divisionalized companies that an excessive development, formalization and bureaucratization of strategic business planning system happen. In that case, planning and controlling units, dealing with drafting of business plans both in divisions and at the company top, are dramatically widened, and they increase the number of employees as well as their own importance. These units use more and more sophisticated methods in drafting the plans, they require the managers to submit more and more information which they process and, as a result, they produce more and more documents, both in paper and electronic. But, this is still not the worst thing. The worst thing is that the process of strategic planning, and especially the process of business planning, becomes more an intellectual exercise than a real process of orienting the company and its divisions' business operations. Gradually, the strategic and business plans become excessively developed, over precise, with too many information, unclear and hard to understand

to divisional managers. Strategic and business planning becomes its own goal. For a company it becomes more important that it has strategic and business plans than that they are realistic and usable in the practice of company management. This is a typical example of the anomaly characteristic of bureaucratization, which is called "goal and means substitution", when the means become its own goal. The consequence is bureaucratization of the entire company, its loss of flexibility and all the advantages of divisionalization. We could say that there is also a third type of mistakes in the implementation of performance standardization in divisionalized company, although such type of mistake could sooner be ascribed to the problems in delegation of authority. Namely, in some companies, strategic and business plans are adequately drafted and represent a solid foundation for coordination and control of divisions' work, but they are not followed. The strategic company top or divisional management simply does not use the business plans in running the company business operations or divisions. The strategic company top can, for the purpose of increasing their operative influence on the work of divisions, disregard the business plans and impact the divisions' work even outside of the business plans' framework. The company top justifies this by alleged poor quality of the business plans or by a change in circumstances comparing to when these plans were drafted. On the other hand, divisional management can do the same. Striving to increase its autonomy, divisional management can take actions that surpass the framework of the approved business plan. In both cases, the problem is not so much in the business plans per se, as it is in management's, conscious or unconscious, disregarding and avoidance of their implementation.

Conclusion

Aside from being attractive, the divisional model of organizational structure is also a very risky model. This type of organizational structure has many advantages. It enables flexibility and entrepreneurship even to large companies, which is a very challenging task. Divisional model offers alternative to large companies in comparison to bureaucratic organizational model; hence, it is very popular and it has always a positive connotation. But, on the other hand, divisional organizational model carries some risks. It is a highly complex model of organization, whose design and implementation require vast knowledge and rich experience. The mistakes in designing and implementation of divisional structure lurk from all sides. Still, the most prominent risks of divisional model are linked to its three key dimensions: structuring of divisions and centralized functions; delegation of authority; and system of coordination and control based on performance standardization. The first mistake that can be made while designing a divisional model may occur already in the first stage: in determining the very divisions. Divisions as the basic organizational units must be set up in such a way that there is no, or at least no significant, interdependence and transactions among them. Only a pooled interdependence should exist among divisions. On the other hand, a mistake can also be made in creating of centralized functions if they are selected in a wrong way or if too little or too many functions are centralized at the corporate top. The second mistake can be made while establishing a fine division of authority between the corporate management and the divisional management. This delegation of authority should follow a strategic management – operative management direction. This is, of course, easy to say, but in practice it is difficult to establish a precise division between strategic and operative decisions. Even when it is well established, this division of authority between the corporate management and the divisional management is prone to being disrupted during its implementation. Then an unwholesome imbalance of authority and responsibility occurs, either by the company top starting to get involved in divisions' business operations (which happens more often), or by divisional managers starting to overtake the strategic decisions-making (which happens rarely). The third risk in designing and implementation of a divisional model lies in the mechanism of coordination and control of the divisions. This mechanism is the performance standardization, and it is operationalized through the system of strategic and business planning. The risk that a divisional model carries in itself consists of strategic and business planning being either underdeveloped, of poor quality and ineffective or excessively developed,

formalized and bureaucratized. Having all this in mind, it is possible that, even though effective, strategic and, especially, business planning are disregarded in practice by company or divisional managers. All three described groups of mistakes in divisional model designing lead to loss of all its advantages and, of course, poor performance of a divisionalized company.

References

1. Ashkenas, R. (2002). *The boundaryless organization*. San Francisco: Jossey-Bass.
2. Chandler, A. (1962). *Strategy and structure*. Cambridge, MA: MIT Press.
3. Child, J. (2005). *Organization*. London: Blackwell.
4. Galbraith, J. (1998). Linking customers and products. In S. Morhman, J. Galbraith, & E. Lawlwer (Eds), *Tomorrow's organization* (pp. 51-76). San Francisco, CA: Jossey Bass.
5. Goold, M., & Campbell, A. (2002). *Designing effective organizations*. San Francisco, CA: Jossey Bass.
6. Goold, M., & Campbell A. (1987). *Strategies and styles: The role of the centre in managing diversified corporations*. Oxford, UK: Basil Blackwell.
7. Finegold, D., Lawler, E., & Ledford, G. (1998). Organizing for competences and capabilities: Bridging from strategy to effectiveness. In S. Morhman, J. Galbraith, & E. Lawlwer (Eds), *Tomorrow's organization* (pp. 133-154). San Francisco, CA: Jossey Bass.
8. Mintzberg, H. (1989). *Mintzberg on management*. New York, NY: Free Press.
9. Mintzberg, H. (1979). *The Structuring of organizations*. Englewood Cliffs, NJ: Prentice Hall.
10. Robey, D., & Sales, C. (1994). *Designing organizations*. Chicago, IL: Irwin.
11. Tushman, M., & Nadler, D. (1997). *Competing by design*. Oxford, UK: Oxford University Press.

Nebojša Janićijević

is a Full Professor at the Faculty of Economics, University of Belgrade, where he teaches courses in the field of organization, human resources management and change management to students at undergraduate, graduate and doctoral studies. So far, as an author and coauthor he published several books, and among them "Organizational Change Management", "Organizational Culture and Management" and "Enterprise Organization". He published a number of articles in foreign and domestic academic journals, and participated in many international scientific conferences. He was three times at study stays at U.S. universities as a receiver of fellowship of Fulbright Program. He is a member of the European Group for Organizational Studies (EGOS) and the European Academy of Management (EURAM). Nebojša Janićijević is a consultant for leading domestic companies in the field of organizational restructuring and human resources management.

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Đorđe Kaličanin
University of Belgrade
Faculty of Economics
Department of Business Economics and Management

Olga Gavrić
University of Belgrade
Agricultural Faculty
Department of Economics

THE IMPORTANCE OF CLUSTERS AS DRIVERS OF COMPETITIVE ADVANTAGE OF COMPANIES

Značaj klastera u unapređenju konkurentske prednosti preduzeća

Abstract

Competitive advantage is the main indicator of quality and successful positioning of a company. It stems from the existence of distinctive competence and is seen as a result of a good strategy. As such, it determines which company will be successful in the global competition as well as which company will convert threats, brought by the turbulent environment, into opportunities. One way to create and improve competitiveness is to connect companies in clusters. Clusters, as a form of local association of companies, encourage innovation, productivity, more efficient use of limited resources, creation and expansion of new competencies, and create value for all their participants. Based on different connections, they enhance not only the competitive advantage of companies but also the competitiveness of the national economy.

Key words: *clusters*, *competitive advantage*, *value*, *synergy*, *companies*

Sažetak

Konkurentska prednost je glavni indikator kvaliteta poslovanja i uspešnog pozicioniranja preduzeća. Ona proističe iz postojanja distinktivne kompetentnosti i javlja se kao rezultat dobre strategije. Kao takva, opredeljuje koja preduzeća će biti uspešnija u globalnoj tržišnoj utakmici i koja će pretnje koje sa sobom nosi turbulentno okruženje pretvarati u šanse. Jedan od načina za stvaranje i unapređenje konkurentske prednosti je i povezivanje preduzeća u klastere. Klasteri kao vid lokacijskog udruživanja preduzeća, podstiču inovativnost, produktivnost, efikasniju upotrebu ograničenih resursa, kreiranje i širenje novih kompetencija, kao i stvaranje vrednosti za sve učesnike u istom. Po osnovu različitih veza u klasteru, unapređuje se konkurentska prednost preduzeća, ali i nacionalne ekonomije.

Ključne reči: *klasteri*, *konkurentska prednost*, *vrednost*, *sinergija*, *preduzeća*

Introduction

The imperative of change, macro-arrogance and trends in the global economy, as main features of the contemporary business environment, impose the need for the formulation of new and improvement of the existing business strategies. Strategy, as the main guiding idea in continuously changing conditions, should contribute to the creation of a permanent competitive advantage [3, p. 180]. However, despite good formulation, it is also important that strategy is well implemented. One of the well-implemented strategies relates to connecting companies in clusters. This strategy provides an opportunity for SMEs to be more micro competitive, to be well-positioned in the market, and to achieve sustainable growth, i.e. the growth that creates value for owners and other stakeholders in the enterprise. In addition to micro competitiveness, clusters also enhance the competitiveness of the national economy, which is in accordance with the "diamond" theory[1]. In support of this assertion, numerous examples of successful clusters around the world (Italy, USA, Spain, etc.) are cited in this paper, which will be discussed in more detail further on in the text.

1 According to the "diamond" theory of national competitiveness, each determinant (general conditions, demand conditions, strategy context and related industries), independently and in interaction with each other, influence main elements of success in the global market, as well as the character of the business environment, in which local companies create value.

The concept of clusters was first introduced in the economic literature by *Michael Porter*, who defined clusters as geographic concentrations of interconnected companies and relevant institutions dealing with appropriate activities, linked by common characteristics and complementarities. In his analysis, *Porter* has found that clusters represent a critical mass of competitive success of companies, regions or countries in a dynamic environment and the economy based on knowledge [6, pp. 202-204]. He also pointed out that the main source of competitive advantage is productivity growth based on information exchange and resource sharing as well as the growth of innovation, based on the rapid exchange of ideas and technological knowledge. This fact reflects the importance of clusters. An important feature of clustering is that it emphasizes the role of location in the competitiveness of an economy, which has been excluded from the economic analysis at one point.

Government and its institutions, such as universities, development agencies, advisory bodies, etc., give great support to clusters. Clusters, as a form of association of companies in the market, are present not only in the world but also in the domestic economy. All of these features will be discussed in this paper.

Innovation, productivity and competitiveness

Clusters, as a form of location association of companies, appear in a variety of industries and sectors (information technology, film industry, construction, tourism, fashion industry, etc.). Clusters are typical of both developed and less developed economies, but they are better organized in the developed economies. The boundaries, size and type of connections within the cluster are dynamic categories. The entries of new companies (suppliers, customers or related companies) are expanding cluster vertically or horizontally, respectively. Types of connections in a cluster are also subject to change and depend on the allocation of resources and capacities of companies in developing optimal relationship.

Clusters have a number of advantages and disadvantages that we shall mention and analyze. Based on the multiple links within the cluster and the synergies in that respect, economies of scale and better mobility of resources emerge, which creates superior value for customers and adequately meets their needs. Furthermore, clusters take advantage of a location and form the basis for creation of distinctive competence as a very important goal of the company.

Clusters also encourage productivity and innovation of a company because these groups have the information database and are able to take full advantage of it. In fact, thanks to the aforementioned database, all participants have the right information at the right time, thereby creating a basis for initiation and innovation as well as for efficient and effective operations. As we have mentioned, by improving the competitiveness of the participants in clusters, the national competitiveness is also being improved (the development of regional and rural areas is being encouraged). Clusters are, thus, providing a basis for the cooperation of companies, which softens inter-professional competition fears. This creates conditions for the rapid exchange and implementation of new knowledge and skills.

Anyway, despite numerous advantages, clusters also have certain disadvantages. In fact, a cocooning effect may occur, in the sense that a cluster may eventually evolve into a self-sufficient system, which, of course, carries the risk for its functioning and survival. When companies decide to join a cluster, there may be a wrong choice of the branch. Also, a political system, lack of an adequate infrastructure and some other elements can be a barrier to the development of clusters. Apart from that, the absence of state regulation or assistance can be an obstacle for the development of clusters. A significant deficiency is a risk of loss of technological discontinuities [5].

The success of a cluster depends greatly on the specialization, cooperation, flexibility and diversification of enterprises [1]. The relations of cooperation enable companies to compensate for their weaknesses, increase flexibility and react faster to signals from the environment or initiate some change. Specialization is also crucial for the success of clusters, because it contributes to their diversification. Last but not least, an important factor is the transfer of technology, knowledge and information as well as workforce training and social infrastructure.

The influence of clusters on productivity, innovation and competitiveness is especially emphasized in the economic literature. Namely, clusters encourage productivity of companies in several ways. Firstly, clusters allow easier access to the necessary material factors of production and specialized professional staff. Secondly, they make access and flow of information easier. Thirdly, clusters increase productivity by allowing complementary activities of participants and constant cost savings. Thanks to the procurement from local suppliers, companies reduce transaction costs (in acquisition they cannot use a remote source) or import charges (if inputs are purchased from abroad). The need for inventory is also minimized, thus, the inventory costs are reduced. Significant savings are achieved in the field of marketing and branding. Furthermore, cooperation between enterprises within clusters enhances transparency and communication, and prevents opportunistic behavior of suppliers (in terms of delay and the quality of goods).

Strong competitive pressures from local competition within a cluster encourages companies to operate more efficiently and effectively as well as to improve their own competence, which ultimately leads to competitive advantage and better positioning in the global market. What is important to point out is that clusters also enhance the competitiveness of regions and national economy. The positive effects spread to other sectors as well, which contributes to the improvement of the competitive position of the economy in the world economic context.

Highly significant effect of a cluster is the impact on innovation in enterprises. The effects on innovation and productivity of enterprises in a cluster are highly interconnected and testify to the fact that the company will have multiple benefits if it operates within the cluster, compared to its independent functioning on the market.

Companies acquire necessary knowledge and information as well as technology and software faster, which leads to the creation of a realistic base for the growth of innovation. Also, due to the cooperation and better communication within the cluster, companies are able to understand the new innovative trends better, which contributes to the diffusion of knowledge, and ultimately, to the acquisition of competitive advantage. Strong local competition creates pressure on companies to constantly innovate; in other words, instead of being followers they become pioneers in the field of innovation, which *de facto* leads to better understanding and meeting of consumers' needs. Sometimes, however, it happens that innovation is not approved by all the participants within the cluster, which inhibits new ideas and provokes inertia, limiting the flexibility of the company.

Government support: Yes or no?

The future of many clusters would be very uncertain without the proper support of the state and state institutions. Because of its importance for the regional economy and economic growth, the development of clusters must be one of the priorities of the economic policy. In this development, the main role is played by various state institutions from development agencies, local authorities to the universities. These entities may influence the development of clusters directly or indirectly. Direct government support may be in the form of laws, tax exemptions and other incentives that encourage companies to join the cluster. Indirect support is reflected in the formation of an expert team, which assists and monitors the cluster or in the establishment of special agencies as forms which mediate between the state and the cluster.

State support is best explained in terms of the "diamond" theory of national competitiveness [6, p. 153]. Using a variety of initiatives, programs or government incentives, state affects each of the determinants (factor conditions, related industries, demand conditions and context strategies) of the "diamond". For example, by collecting specific information on cluster, or by strengthening specialized transportation and communication infrastructure, government affects the development of clusters and factor conditions of an economy. In addition, through sponsoring a forum of participants in the cluster, or through establishing and attracting supplier parks oriented to the cluster, the state stimulates cluster development as well as the development of related industries. Finally, by adopting regulatory standards that are favorable to innovation, the state encourages clustering and conditions of demand. In this way, the state removes the defects in the "diamond" of

national competitiveness and encourages the formation of clusters precisely in those sectors where the "diamond" is the most effective.

In the EU countries, (Serbia has recently become the candidate for the EU), development agencies have the main role in cluster development, acting as a mediator between the small and medium-sized enterprises involved in the cluster on the one hand, and the institutions of the European Union on the other. Mentioned institutions provide the necessary funds for the development of clusters. For example, in France cluster development policy is defined at the national level, in Spain and Belgium at the regional level, while in Italy the local and regional authorities are cooperating with the universities, research centers and service sector. Universities often see clusters as an instrument for spreading knowledge and ideas for the improvement of the quality of final products and services.

According to the World Bank research, the regions that want to encourage economic growth, living standards and competitiveness, mostly support cluster development in the areas such as biotechnology, pharmaceutical industry, information, nanotechnologies, etc. In order to create an efficient environment which supports cluster development in Europe, the EU authorities developed various support instruments such as [4]:

1. Instruments which support the creation of cluster policies at national and regional level, such as PRO INNO Europe Initiative, the European Cluster Observatory and ERAWATCH,
2. Instruments which support networking of clusters and other relevant cluster organizations in Europe, such as Europe INNOVA, FP7 program.

In 2005, the Government of the Republic of Serbia has started an initiative to encourage the process of association of small and medium-sized enterprises in clusters. Following the example of developed economies in the world (USA, Germany, Italy, etc.), the Government of the Republic of Serbia adopted a program to support cluster development and appointed the Ministry of Economy and Regional Development as the main entity that implements cluster policy. The implementation of this program began in 2007 with the financial support of the Government of the Kingdom of Norway. In the meantime, the Cluster Council and the House of Clusters have been established as the main subjects for mapping information about clusters, representing their interests and promoting them [5].

The Cluster Council is a consultative structural body of the Serbian Chamber of Commerce and unique advisory body for the development of clusters. The Council was established in 2011 and has two main objectives:

1. Affirmation of clusters to improve entrepreneurship and general business environment,
2. Initiation of the establishment of new clusters and contribution to the development of individual clusters.

Members of the Council are representatives of cluster organizations in Serbia. Besides the Cluster Council, the House of Clusters was established in 2011 with technical and financial support from the Danish program for local development, LEDIB. In 2012 the House of Clusters has founded an innovative training center for the cluster development based in Nis, in order to encourage and support the development of clusters. Also a unique magazine about clusters in Serbia "Infocluster" has been designed and the annual October Balkan Conference "Days of Clusters" has been set up in Nis in the same year. All these data go in favor of the fact that the clusters in Serbia are seen as one of the pillars of future development of the national economy. All of these activities in the cluster field are in accordance with the Strategy for the development of innovative and competitive small and medium-sized enterprises from 2008 to 2013. There are around 40 clusters in Serbia, of which those in the construction sector and tourism dominate the market. This will be discussed below with an emphasis on fashion sector, clothing and footwear.

Examples of successful clusters: Europe and Serbia

Case of Italy and Spain

In the previous analysis, we have seen some of the benefits for a company that occur as a result of the presence of clusters in the economy such as increasing competitiveness, greater participation on international markets, and better positioning. As a confirmation of given facts, we will

overview the experiences of two EU economies (Italy and Spain) and the domestic economy (Serbia), with special emphasis on the fashion industry.

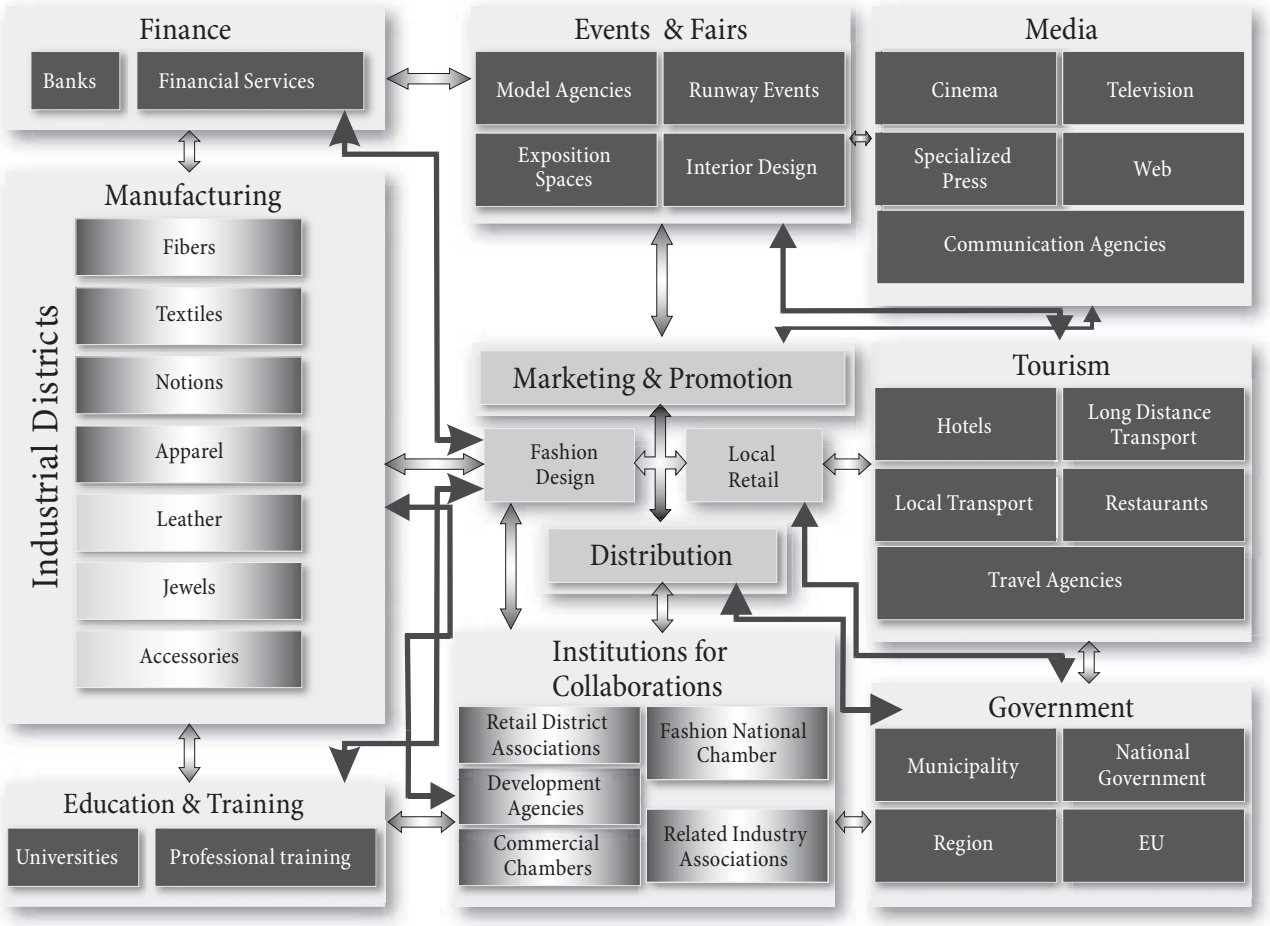
The first cluster, as a form of location association of small and medium-sized enterprises, has emerged in Italy in the region of Emilia Romagna. The famous cluster of ceramic tiles is a synonym for the first cluster, and is also the most analyzed example in the economic theory. This cluster has proved that, due to the presence of multiple connections and synergy, the region of Emilia Romagna recovered and developed after the Second World War, which ultimately affected the whole of the Italian economy. However, the clothing and footwear cluster, i.e. the so-called fashion cluster, for which this Mediterranean country is famous in the world, is much more interesting for our study.

The headquarters of the fashion cluster is in Milan, Lombardy region. The beginning of the emergence of this cluster dates back to the seventies, when two groups of companies, the design and sewing company, began to cooperate with each other. During the same period the famous "Stilismo" appeared. In other words, on the fashion scene several fashion companies emerged, respectively: Armani (1975), Versace (1978), Moschino (1983) and D&G (1986). With the adequate financial support, as well as with the support from the Government, universities and the media, this cluster became the world's leading cluster in the industry and one of the major brands of Italy, some twenty years later. The secret of its success is one of the most frequently asked questions. First, it should be noted that the cooperation itself, or rather multiple connections between companies from sectors such as textiles, leather, fashion accessories and jewelry have resulted in a unique design for which they are famous in the world. Vertical (simply put, supplier – manufacturer – customer) and horizontal (connection of companies involved in similar activities) connections resulted in a pioneering and innovative position of these companies as well as in their competitive advantages. Thanks to synergies and productivity growth, these companies are coming to right information that enables them to adequately respond to the needs of consumers around the world, which is also reflected through the growth of exports in the Italian fashion industry. However, apart from the companies in this field, the fashion cluster includes universities that provide professional training of qualified personnel, enjoys the financial support from the banks that finance various development programs, which are initiated by the regional authorities (the Chamber of Commerce, the Fashion Chamber of Commerce) as well as the state itself. This proves once again that the state support is crucial for the survival of the cluster. Media, such as television and internet, play an important role in the fashion cluster by further promoting and providing necessary information on the companies. Companies organize the famous Fashion Week and other events (Fiera Milano), which contribute to the further development of tourism in the city of Milan as well as in the region in general.

Most of these factors, which have contributed to the development of the fashion cluster, are also the determinants of the "diamond", which is in accordance with the fact that, if a cluster is in the segment where the "diamond" is the most effective, the determinants affect independently and in a synergy the improvement and the competitiveness of both clusters as well as the national economy. For example, the media and universities are determinants of relating and supporting industries, foreign and domestic sources of growth are conditions of demand, while the general idea of the existence of "Made in Italy concept design" is a factorial condition. In Figure 1, you can see the whole map of the Milan fashion cluster.

In another Mediterranean country, Spain, cluster policy can be assessed as a determined initiative of the regional government [2]. Also, the public sector has the role in cluster development, whose level of engagement depends on the particular region. Zara and Massimo Dutti, the famous brands from Spanish fashion cluster, are located in Galicia (most of the companies within the Galician fashion cluster have been founded by the entrepreneurs from small towns in the region). Fashion cluster in Spain was created and developed spontaneously due to the companies that have been able to recognize the need for cooperation and joint participation in the global market. In contrast to the above-mentioned Italian fashion cluster, Spanish cluster development began in the mid-nineties and, some ten years later, it started its domination.

Figure 1: Milan fashion design cluster map



Source: Authors

In the period from 1997 to 2007, the export of Spanish fashion cluster grew at a rate of 24%. The data also show that in 1997 Galicia took second place (20%) after Catalonia (47%) in the total export from Spain. Catalonia is otherwise known for brands such as Mango. Just a decade later, there has been an increase in export from 20% to 48%, so that Galicia received the title of the largest exporter in Spain. As in the case of Italy, a lot of support for the development of the cluster has been given by the universities, suppliers, regional authorities and the media. The main competitive advantages of the companies of this cluster are good quality and very affordable price of their clothing pieces, a fact that enable them to reach the large market of consumers around Europe and worldwide.

Case of Serbia

Clusters are a relatively new phenomenon in the domestic economy. Most of them were established in 2005, and are currently at the early stages of development. The main incentives for the development and expansion of clusters are provided primarily by the Government of the Republic of Serbia and the Ministry of Economy and Regional Development in order to improve the business and national competitiveness as well as to strengthen the entrepreneurial spirit. In addition to this, we hereby list other objectives, to which clusters should contribute [8]. These are:

- Definition and strengthening of cluster infrastructure by creating a database of its members,
- The establishment of cooperation in various fields of cluster activity as well as training of human resources,
- Facilitation of the process of introducing innovations and new technologies,
- Expansion and development of clusters,
- Connection with related clusters in the region,
- Provision of larger and more stable export supply.

Frequently asked question is why there hasn't been earlier cluster development in the local economy, as in comparison with the United States, Italy, Germany, and other economies Serbia falls behind. First of all, there was no favorable environment for the development of clusters. The main limiting factor was the lack of cooperation, coordination and confidence that are the basis for the development of clusters. Besides, there were no supporting activities (logistics activities, research activities related to products and brand, etc.) and complementary forms of production to encourage the further development of clusters. Finally, low liquidity of the economy, with gloomy economic picture burdened with geopolitical problems, led to a backlog.

Forty clusters operate currently in Serbia, of which several are national, while others are regional [4]. If we look at the representation of industries, tourism is leading with six and the construction sector with five clusters, followed by textile, agriculture and food industries. In addition, there are also clusters in ICT sector, service cluster, scientific cluster and two clusters in the environmental sector, which promote recycling and energy efficiency. Certainly all of these clusters contribute to the improvement of competitiveness in Serbia.

All clusters can be divided into clusters of zero, first and second phase [4], in accordance with the level of their development. Generally, the zero phase clusters are the least developed and the second phase clusters are the most developed.

For example, the zero-phase clusters are:

- Cluster Sombor salasi – tourism,
- Cluster Reciklaza jug – ecology,
- Cluster Dis Nis – design.

Clusters of the first phase of development are:

- Cluster Istar 21 – tourism,
- Vojvodina ICT Cluster – information technology,
- Cluster FACTS – fashion, clothing industry,
- Cluster Pollux – food production,
- Cluster Ecopanonia – environmental sector,
- Cluster Start Up – service sector,
- Cluster Subotica-Palic – tourism,

The most advanced group of clusters (Phase II) includes:

- Automotive Cluster AC Serbia,
- Dundjer – construction,
- Cluster Flower of Sumadija – floriculture sector,
- Medical Tourism Cluster,
- Netwood – production of furniture and interior design.

To make our analysis complete, this time we shall analyze the cluster model in Serbia in order to comprehend which international experience can be used in the further development of local clusters. In the domestic economy, there are several clusters in the sector of textiles and fashion, which are usually in the first stage of development and are present in both northern and southern parts of Serbia. The existence of these clusters is of great importance for the development of the textile industry sectors as well as for the promotion of domestic clothing brands in the European market [9]. Cluster development will certainly improve the competitiveness of local enterprises and facilitate the competitive struggle with the well-positioned companies on the European market that will inevitably lead to Serbia's entry into the EU. There are several clusters in the field of fashion and clothing, such as: Clothing Industry Cluster Southern Banat, ASSTEX, Textile Start Up, FACTS, the Impulse – textile exporters, textile cluster NIS.

The cluster ASSTEX was founded in 2009 in Novi Pazar and includes 14 companies. This Textile Association employs 779 people and generates annual turnover of EUR 9,585,884. As most of the world's clusters, ASSTEX cooperates with secondary textile school, professional high schools and universities that provide support in the form of training of future employees in the textile industry.

Much more successful and better known is the cluster FACTS, an association that consists of 16 private companies and three academic institutions. Members of this cluster are well-known domestic fashion brands Tiffany Production, Knitwear Ivkovic, PS Fashion, Extreme Intimo, Luna, Garman, Soda sport, Leonardo Jeans, Jasmil, AMC, etc. In other words, the cluster brings together producers of dresses, sweaters, jeans, underwear, and sports equipment. Cluster FACTS, as previously mentioned, cooperates with the Faculty of Applied Arts, the professional high school of Design and the Technical Institute Mihajlo Pupin. The cluster was established in 2010

and, in the following year, had the total turnover of EUR 54 million, whereas the total amount of export was EUR 14 million. The main export markets are the markets of former Yugoslavia, Europe and Russia. The total number of direct employees is 2611 and, indirectly, 3500. The cluster is supported by the Secep EU project (2010-2012), by the German government as part of GIZ ORF project (2011-2013) as well as by the Swiss government through a SIPP (2012-2015). Since 2012 the cluster has been a member of the AHK German – Serbian association, with the aim of deepening international cooperation [7]. The main goal of this cluster is the acquisition of new knowledge, innovation and technology, as well as improving the quality of business in order to better promote domestic brands in the European market.

If we make a parallel between Italian, Spanish and Serbian fashion clusters, we come to certain facts which point to potential development directions for Serbian clusters. It becomes clear that greater networking of enterprises is necessary, that is, a greater collaboration between the producers and suppliers, logistics channels and exporters is needed in order to achieve the aforementioned cost savings, and hence, productivity growth, synergies and competitiveness. In other words, it is necessary to encourage vertical integration. Universities, local authorities and the media which provide appropriate support (through facilitation and promotion) should be more involved, and banks as basic financiers should support companies through soft loans, which should encourage them to join the cluster. Finally, domestic clusters should cooperate with regional clusters within the same sector, which can contribute to better sales on foreign markets as well as to the rapid adoption of new knowledge and ideas.

Conclusion

The analysis in this study showed the importance of business competitiveness and highlighted the creation of the value as one of the enduring goals of the company's management. This ultimate goal can be achieved in various ways; one of them is organizing companies into clusters. This type of local association of companies leads to the more efficient use of both internal and external resources of a company. The association of companies with complementary partners or connection with suppliers and customers creates a real basis for the improvement of productivity and innovation, and, ultimately, for the competitiveness of enterprises. Economically speaking, the power of one cluster lies in the cooperation as well as in multiple connections that result in synergy.

The positive effects of clusters are not only reflected in the economic sector in which cluster operates, but they spill over to other economic sectors and the national economy as a whole. It confirms the repeatedly mentioned *Porter's* theory of the "diamond" of national competitiveness. One of the effects of clustering is the strengthening of regional economy and increase in life standard. In macroeconomic terms, these regions and areas are attractive places for investment and attract foreign investors. Clusters promote both new technology and the creation and development of new companies.

On the other hand, the support of the state and state institutions is necessary in order for clusters to become active and popular as a business concept. In other words, public support is crucial. In addition to these facts, the European Union has been using a variety of instruments, incentives, laws, programs and projects to encourage SMEs to associate. Footwear and clothing clusters in Italy and Spain showed how cluster really operates and its importance for an economy. These examples reflect the fact that clusters not only improve the competitiveness of companies, because they are *de facto* world leaders, but also that they promote an economy in the world and are one of the main pillars of export. Also, it has been shown that all institutions (media, universities, financial institutions, etc.) are also involved in the cluster, apart from the producers themselves.

In Serbia, clusters are in the early stage of development. Due to fact that in a few years Serbia will become a full member of the European Union and that the great European market will be opened, bringing with it new competitors, it is considered that further development of clusters enhances competitiveness and enables better positioning of domestic companies. However, as has been pointed out, help from the state is necessary. There has been certain progress in this field. In fact, in 2006 the

Government of the Republic of Serbia adopted a program to support cluster development, and in 2011 the Cluster Council and the House of Clusters have been established. In addition to the support of the Serbian government, domestic clusters have the support of international partners, such as Germany, Switzerland and Norway. Clusters are increasingly promoted as a business concept, which can also be seen at an annual event "Days of Clusters", which takes place in Nis.

In order to develop clusters in Serbia, it is necessary to improve cooperation, coordination of activities and confidence which are the real basis of cluster existence. It is also necessary to include more supportive activities (universities, media, financial institutions, agencies) as well as to strengthen cooperation with suppliers/importers and buyers/consumers, which encourages further development of clusters and eliminates production bottlenecks that create additional costs. Apart from that, we need to analyze foreign experience as possible direction of the future development and deepen cooperation with other clusters in the region. In order to achieve these goals, it is necessary to change the concept of business philosophy in the direction of presenting clusters as one of the main pillars of creating sustainable competitive advantage.

References

1. Bošković, G., & Jovanović, A. (2009). Uticaj klastera na konkurentnost i regionalni razvoj industrije. *Ekonomske teme*, *1*, 107-119.
2. Bošković, G., & Kostadinović, I. (2011). Klasteri malih i srednjih preduzeća – ključ ekonomskog razvoja. *Škola biznisa*, *4*, 54-67.
3. Đuričin, D., & Lončar, D. (2010). *Menadžment pomoću projekata*. Beograd: Ekonomski fakultet.
4. Ministarstvo ekonomije i regionalnog razvoja Republike Srbije. (2008). *Klasteri Srbije – Brošura*. Retrieved from http://data.sfb.rs/sftp/organizacija.sum/MATERIJALI/PRETHODNI/Vezbe%202011-2012/5.%20Klasteri/dodatni%20materijali/Brosura-Klasteri%20Srbije.pdf
5. Parušević, V., & Cvijanović, D. (2006). Značaj i uloga klastera u identifikaciji konkurentnosti agrarnog sektora Srbije. *Industrija*, *44*(1), 81-90.
6. Porter, M. (2008). *O konkurenciji*. Beograd: Fakultet za ekonomiju, finansije i administraciju.
7. Privredna komora Srbije. (2012). *Katalog klastera u Srbiji*. Retrieved from http://www.pks.rs/SADRZAJ/Files/Odbor%20za%20MSPD/katalog%20klastera%202012.pdf
8. Stanković, Lj., & Đukić, S. (2010). Unapređenje poslovne konkurentnosti razvojem klastera. *Ekonomika preduzeća*, *58*(3-4), 131-139.
9. Urošević, S. (2011, October). Koncept klaster – rešenje za opstanak malih i srednjih preduzeća u sektoru tekstila. In *Zbornik izvoda radova / IX simpozijum "Savremene tehnologije i privredni razvoj"* (pp. 252-259), Tehnološki fakultet Leskovac.

Đorđe Kaličanin

is an Associate Professor on course in Strategic Management at the Faculty of Economics – University of Belgrade, where he acquired all his degrees (B.Sc., M.Sc. and Ph.D.). On master studies he teaches courses in Strategic Finance and Business Strategy. He is the author of articles in the scientific fields of strategic management, business planning and value-based management. He led and participated in projects of strategic planning, investment decision making, business planning, organizational design, valuation and compensation system design. He is the Manager of the Publishing Center at the Faculty of Economics.

Olga Gavrić

was born in 1985 in Belgrade. She received bachelor degree (International finance, 2009), and master's degree (Business management, 2012) at the Faculty of Economics, University of Belgrade. Currently, she is a PhD student in Business Management at the same University. She is a Teaching Assistant at the Faculty of Agriculture (Department of Economics), University of Belgrade.

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Vladimir Dženopoljac
University of Kragujevac
Faculty of Economics
Department of Management and Business Economics
Kragujevac

INTELLECTUAL CAPITAL: IMPORTANCE, MEASUREMENT, AND IMPACT ON CORPORATE PERFORMANCE

Intelektualni kapital – značaj, merenje i uticaj na performanse

Abstract

There is evidence that intellectual capital (IC) positively affects growth potential and generates added value to the enterprise performance. Different forms of IC, such as knowledge, employee skills, talent and enthusiasm, patents, know-how, software, databases, management process, corporate strategy and plans, close relationships with customers, brand, unique organizational design, and corporate culture, can be classified as human, structural, and relational capital of an enterprise. The research studies that address IC measurement and its impact on corporate performance are gaining increasing attention during last two decades. This is especially important since there are various controversies and misunderstandings over IC nature. The paper presents the empirical results attained through six important research studies that investigated the impact of IC on corporate performance of enterprises in Serbia. The key research question is as follows: Do IC and its key components affect corporate performance of enterprises in Serbia, and if so, to what degree? The results of these studies reveal that corporate performance of enterprises in Serbia are mainly determined by the amount of physical and financial capital, and far less by the efficient use of different elements of IC.

Key words: *intellectual capital*, *intangible assets*, *corporate performance*

Sažetak

Brojni su dokazi koji nedvosmisleno ukazuju na činjenicu da intelektualni kapital opredeljuje potencijal rasta preduzeća i generiše najveći deo uvećane vrednosti. Različiti oblici intelektualnog kapitala, kao što su znanje, veštine, talenat i entuzijazam zaposlenih, patenti, *know-how*, softveri, baze podataka, menadžment proces, korporativna strategija i planovi, bliski odnosi sa klijentima, brend, jedinstveni organizacioni dizajn i poslovna kultura, mogu se kategorizovati kao ljudski, strukturni i relacioni kapital. Istraživanja u oblasti merenja intelektualnog kapitala i utvrđivanje njegovog uticaja na poslovne performanse preduzeća sve više dobijaju na značaju u poslednje dve decenije. Ovo je posebno imajući u vidu da ova pitanja prate i brojne kontroverze i nerazumevanja prirode intelektualnog kapitala. U radu se daje pregled rezultata do kojih se došlo u šest različitih istraživačkih studija o uticaju intelektualnog kapitala na poslovne performanse preduzeća u Srbiji. Ključna istraživačka dilema u radu je: da li intelektualni kapital i njegove različite komponente utiču na poslovne performanse preduzeća u Srbiji i u kojoj meri? Rezultati šest najznačajnijih istraživanja u Srbiji ukazuju da su poslovne performanse preduzeća i dalje pod jačim uticajem fizičkih i finansijskih resursa, a manje pod uticajem efikasnosti upotrebe pojedinih elemenata intelektualnog kapitala.

Ključne reči: *intelektualni kapital*, *nematerijalna aktiva*, *poslovne performanse*

Introduction

The important characteristic of business model in the knowledge-based economy is domination of intangible resources over material ones in the value creation process of an enterprise. After introducing Windows 95, the market value of Microsoft rose to USD 100 billion, which was higher than Chrysler and Boeing at the time. For comparison, the book value of Microsoft was only USD 8 billion. Netscape was worth USD 17 million prior to becoming public company and was hiring only 50 employees. On the first day as a public company, the market value of Netscape went to USD 3 billion. In addition, the average market value of all the enterprises on New York Stock Exchange (NYSE) is 2.5 times their book value, while the IT companies have market value approximately 10 times their book value. The question here is obvious: How can we explain this evident disparity between market and book value of mentioned enterprises [3, pp. 1-2]? The answer to this question lies in the effective and efficient use of intangible resources enterprises possess such as knowledge, competencies, experience, brand, corporate image, leadership, corporate culture and alike.

Until the 1990s, a typical process of strategic management started from external environment analysis and then went to internal analysis. This approach proclaimed that a strategist should firstly analyze external opportunities and threats, and afterwards industry attractiveness from the standpoint of competition, entry barriers, substitutes, negotiation power of suppliers and customers. The next phase implies internal analysis through identification of strengths and weaknesses in order to formulate the strategy adequately. The final phase entails strategy implementation through resources allocation. However, contemporary strategic management approaches place focus on internal rather than external perspective. Within the phase of strategic analysis, the focus shifts from industry structure and competitive positioning to internal factors and business processes, which are unique to certain enterprise. This management approach is known as the resource-based view of the firm (RBV) [19, p. 396].

The resources of an enterprise represent the key factor in strategy formulation and implementation. Competitiveness is achieved by ownership and productive use of enterprise resources. The resources represent the most significant prerequisite for attaining and sustaining competitive advantage. RBV assumes that enterprise possesses different sorts of resources that allow it to develop various strategies [27]. *Barney* [5] views enterprises as heterogeneous entities, which are characterized by their unique resource base. In this sense, certain resources are more potent in terms of achieving sustainable competitive advantage. The resources that have better potential for attaining competitive advantage are valuable, rare, difficult to imitate, and without substitute.

In the era of knowledge, resources that do not possess physical form are becoming more important and represent the critical factor of corporate success. *Prahalad* and *Hamel* [47] used the term "core competence" in order to describe enterprises' ability to learn, coordinate different production capabilities, as well as their ability to adopt new technological trends. In comparison to tangible resources, the intangible ones, such as knowledge, skills, talent, relationship with clients, corporate culture, reputation, and organizational practices, are not explicit and visible [56]. These intangible resources and the ability to exploit them properly represent the essence of intellectual capital (IC).

The IC value of most successful enterprises is often 10 to 20 times their value of material assets [51, p. 2]. Ongoing economic crisis especially emphasizes the importance of investing in IC. Investing in immaterial assets is the best way of coping with the challenges of today's economic ambient [38]. However, despite its significance, assessing the value of IC is very difficult task. This is why many researchers focused their efforts towards the issues of evaluating IC and determining its impact on corporate performance. This is especially important for Serbian economy since a low level of competitiveness of its real sector points to the importance of executing new proactive strategy. According to *Amit* and *Schoemaker* [2], managers are the ones who face the challenges of identifying, developing, protecting, and using the resources and competencies, in a way that would enable the enterprise to achieve sustainable competitive advantage and extraordinary returns.

The paper analyzes the actual situation in terms of researching the impact of IC on corporate performance of

enterprises in Serbia. The paper has *two basic objectives*. *Firstly*, to compare results of research studies undertaken in different countries, using different samples, to the results of the research studies done in Serbia. *Secondly,* based on these empirical results it is important to estimate the impact of IC on corporate performance of enterprises in Serbia. In accordance to these research results, the paper explores the following *research question*: Do IC and its components affect corporate performance of Serbian enterprises and to what extent? Bearing in mind the research objectives and the basic research dilemma, the paper will use conventional research methods that are based on the collection and analysis of available literature and empirical data, including the results of author's own long-term research carried out in Serbia.

In accordance with the foregoing, the work is divided into an introduction and the following four parts. The first part, which is devoted to the definition and importance of IC, is a theoretical and methodological framework for understanding the concept of IC and its importance for creating value in the enterprises of information era. The second part relates to the most important approaches to measuring IC and its contribution to the creation of value. The third and crucial part of the work deals with the analysis of the results of applied research studies in Serbia, which are intended to demonstrate the impact of IC on business performance of enterprises. The final part contains concluding remarks and directions for future research.

Definitions of intellectual capital

The conceptual basis for an adequate understanding of the IC relates to the RBV. The problem with the IC management is reflected in the fact that managers are aware that it is a critical factor for business success in the knowledge-based economy, and yet, on the other hand, are unable to provide an adequate definition of IC as well as to identify clearly its constituent elements. In the literature, there are many definitions of IC as well as a number of terms by which it is described. One of the most widely accepted ways of defining IC comes from researchers who have a vocation outside the sphere of the accounting profession. This approach views IC as the positive difference between market and book value of an enterprise [22], [44], [54], [56]. However, this approach does not provide precise and clear directions about what are the elements of this equation. On the other hand, researchers in the field of accounting define the difference between market and book value of assets, which can be disclosed, as goodwill [6], [23], [46]. Seen from the accounting point of view, it seems that goodwill represents IC, or a portion thereof. However, the goodwill may be generated internally or externally, but according to accounting conventions, only externally generated goodwill may be disclosed in the financial statements, properly valued, and amortized at the end of the prescribed period. Everything above leads to the conclusion that goodwill is equal to IC of an enterprise. This conclusion can be accepted only partially since IC is a much broader concept.

When defining IC, there is a general tacit agreement that it is a non-monetary asset without physical substance but has value and potential to generate future benefits for the enterprise. *Hall* [28] observed IC as a collection of contemporary value drivers, which productively transform resources into tangible assets with extra value. IC is responsible for creating the intellectual comparative advantage, which is the main source of sustainable competitive advantage. *Brooking* [11] defines IC as a set of "market resources", "employee-related resources", "property-related intellectual property", and "infrastructure assets", which, when properly connected to other productive resources of an enterprise, most likely would lead to value creation. *Edvinsson* [21] states that IC is not an objective thing but rather a matter of relationships with customers and employees. Specifically, he looks at IC as something borrowed from employees and customers. *Bontis* [7] argues that IC has such attributes that can lead to increase in enterprise value. *Stewart* [54] observed IC as a "collective brain power" of companies, which includes knowledge, information, intellectual property, and expertise used in the process of value creation. *Sullivan* [55] defines IC as knowledge that can be transformed into profit. Creating value in an enterprise depends on the profit generated by selling products and services. Furthermore, the sale of products and services directly depends on intangible assets such as reputation, customer loyalty, brand recognition,

or leadership. These are substantially dependent on the human capital of the organization. *Lev* [37] observes IC as a set of resources that will lead to future benefits for the enterprise. He points out that the IC consists of the existing knowledge within the organization that is used to create a competitive advantage.

Definitions of IC differ in certain formal and substantive parts when the authors belong to the field of financial reporting. The International Accounting Standards Board, (IASB) within International Accounting Standard No. 38 (IAS 38) defines intangible assets as non-monetary asset without physical form, which is held for the production of products and services, for rental to third parties, or for administrative purposes. In addition, the aforementioned standard defines intangible assets through the inclusion of the costs of advertising, training, start-ups and research and development [29]. This standard includes a number of activities that can be characterized as intangible assets. What they have in common is the expectation of the capitalization of future benefits. Activities that are generally expected to bring benefit in the future are marketing, distribution, investment in human resources, research and development, brand, copyrights, franchises, trademarks, licenses, rights management, patents, secret processes, and trademarks. Working group on intangible assets of the German association *Schmalenbach Society* defines intangible assets as intangible objects that do not have monetary value or physical expression [4], [17]. From this, it can be deduced that the IC comes from the capitalization of costs of marketing, training, start-ups, research and development, investment in human resources, organizational structure, and the values arising from brands, copyrights, franchises, licenses, rights management, patents, secret processes, and trademarks. The accounting approach to defining and reporting on intangible assets is concrete and specific in the area of its recording and disclosure. In fact, in order for certain element of intangible assets to be expressed in financial statements, it is necessary that there was a historical cost at the time of purchase. Only those elements of intangible assets that can be expressed quantitatively and are externally generated can be capitalized in the balance sheet of the company [14].

The importance of intellectual capital and its elements

During the industrial era, the core value-creation process was good management of material assets of an enterprise (manufacturing plants, points of sale, inventory levels, land, office space, financial resources). The process of creating value in the information age is characterized by the management of intangible assets. As a result, the content of many jobs has significantly changed in the information age. In the period from 1990 until 1999, the share of workers who have been described as professional creative workers increased from 0.7% to 5.7%. Creative workers generate and use IC and include architects, engineers, mathematicians, experts in information and communication technology, experts from the social and natural sciences, city planners, writers, artists, entertainers, and athletes. Until 1999, the U.S. economy, employed 7.6 million of professional creative workers. The largest increase in the value of IC, as well as the growth of its impact on business performance, became evident in the mid-1980s of the last century, with the advent of large "immaterial industries" such as software, biotechnology, and internet-based industries. The growth and importance of IC has continued until today [45].

Investments in IC have become a basic indicator of the vitality of an enterprise and a key measure of future performance. Research shows that IC has significant impact on productivity growth. In the United States, since 1973 until 1995, the IC, on average, contributed 0.4 percentage points to the annual growth of productivity of human labor. This contribution has increased in the period since 1995 until 2003 to 0.8 percentage points. In France, in the period from 1995-2003, IC contributed to an annual increase in productivity of human labor for 0.9%. In Germany, this contribution amounted to 0.6 percentage points, in Italy 0.4, and Spain 0.2 percentage points [16]. In the UK, in the period 1979-1995, IC contributed to an increase in productivity of 0.4 percent per year on average, while in the period since 1995-2003 this number increased to 0.6 [40]. In Finland, IC increased productivity by an average of 0.6 percent per year in the period 1995-2000.

From 2000 to 2005, a year-to-year increase was an average of 0.9 percent [30].

Regarding the elements of IC, the classification that is often cited is a tripartite categorization provided under the Guidelines for managing and reporting on intangibles (MERITUM Guidelines) [43, pp. 10-11]. According to this categorization, IC is divided into the following constituent elements: human capital, structural capital, and relational capital. Human capital is defined as the knowledge that employees take with them when they leave the company. It includes knowledge, skills, experience, and abilities. The examples of human capital are innovation capacity, know-how, previous experience, teamwork, flexibility, employees, tolerance, motivation, satisfaction, learning capacity, loyalty, formal training, and education. The second category of IC, structural capital is defined as the knowledge that remains in the enterprise when a working day ends. Structural capital consists of organizational routines, procedures, systems, corporate culture, databases, and the like. The last category of IC is relational capital. Relational capital can be defined as a set of resources that includes relationships an enterprise can achieve with external stakeholders (customers, suppliers, and partners). Examples of relational capital are image, customer loyalty, relationships with suppliers, customer satisfaction, market position, bargaining power, activities related to environmental protection, and the like. Classifications of IC are also mentioned in several other literature references [8], [52].

Methods for measuring intellectual capital

What characterizes the area of measurement of IC is a wide range of approaches to this problem. Because there is still no completely acceptable system of measuring IC, interest in this area is not abating. During the last three decades, a number of different methods for measuring IC, based on non-financial and financial performance measures, were developed. All measurement methods can be classified into four major categories [51, pp. 247-255]: direct intellectual capital methods (DICM), market capitalization methods (MCM), ROA methods, and scorecard methods. The first three groups of IC measurement methods result in financial value, while the last group indicates the non-financial value of IC and thus focuses on non-financial measures. What is important to note when measuring IC is that it is a process consisting of several stages. The first stage involves the visualization of IC and its components. The result of this stage depends on the adopted definition of IC, the characteristics of the business model, and the needs of the enterprise. The second stage refers to understanding IC. This stage entails the identification and conceptualization of the ways in which enterprise can create value by exploitation of IC. The last stage of the measurement process determines the size of IC. During this stage, management selects and applies specific methods and selected measures, and reports of IC [25].

The first group of methods for IC measurement includes *direct measurement methods*. This group of methods is characterized by the need to estimate the size of individual elements of IC in monetary units. Prerequisites for the application of direct measurement methods are adequate identification of IC elements and their individual valuation. At this point, we get the aggregate amount of the value of IC components, which expresses the size of the IC of a particular enterprise. Direct methods aim at providing detailed view of size and vitality of IC and may be applied at each organizational level. Compared to ROA methods and market capitalization methods, the direct measurement methods are based on the "bottom-up" approach of measuring and hence are more efficient and accurate in determining the value of IC [51, p. 248].

When using *market capitalization methods*, market value of an enterprise is initial entry into the calculation of the size of IC. Financial reports indicate the value of the tangible assets of an enterprise, such as manufacturing plants, equipment, cash, securities, stock, but do not take into account the value of IC such as knowledge, organizational structure, brand value, patents, copyrights, database, customer relations, and the like. Because of this, the book value of the enterprise in practice has never been equal to its market value. The difference between market and book value is positive in cases of successful companies. The existence of this positive difference indicates two things. First, there are assets in addition to tangible assets found on the balance sheet that make

investors believe that the enterprise will generate returns in the future. Second, the company is worth more on the stock market than it is worth according to its financial statements. If we assume that the market value of the enterprise is accurate, then this positive difference can be characterized as IC. In addition to absolute values, the ratio between market and book values can be used as a proxy for IC value. For example, in 2007, Microsoft had 8.5 times greater market value than its book value. On the other hand, General Motors had this indicator at the level of -5.1 [1, pp. 139-140].

Return on assets methods (ROA methods) have one characteristic in common and that is a way of calculating the size of IC, which does not always imply that the return on assets is used. Methods that belong to this group calculate the value of IC or its contribution to value creation by using the data from financial statements of an enterprise. This causes several advantages for these methods. First, these methods are relatively easy to implement and because of this, they are often used in practice. Another advantage is the verifiability of the results obtained in this manner. In addition, ROA methods fit into the logic of the accounting profession and therefore it is easy to understand and interpret the results. These methods are especially useful in cases of mergers and acquisitions because they enable relatively easy comparison of IC performance for subjects of transactions. In addition to the undeniable advantages they possess, ROA methods have a number of shortcomings that must be addressed. One of the main disadvantages is the problem of determining the cost of capital, which is a major input for the calculation of the value of IC in certain methods of this group. In addition to this issue, some ROA methods are not suitable for use in non-profit organizations, individual business units, governmental and non-governmental organizations.

Value Added Intellectual Coefficient (VAIC) is a measurement method introduced by *Ante Pulic* [48], [49], [50]. VAIC belongs to ROA methods. Within this segment of the paper the essence and calculation of VAIC coefficient will be presented in detail since it is the basis for empirical research studies that will be addressed in the next section. This measurement method is based on the degree of achieved value added (VA). The basic premise of the method is that one must start from relative contribution of each type of asset to creation of VA in order to determine the separate contribution of tangible and intangible assets. VA is calculated as follows:

$$VA = OUT - IN$$

In the previous equation OUT represents the output of operations expressed by the total sales revenue. IN indicates the inputs that have been made to generate sales revenue. The inputs include all expenses except for the costs associated with human resources. Employee-related costs are here treated as an investment, not as an expense. Alternatively, VA is calculated as a sum of operating profit (OP), employee costs (EC), and depreciation and amortization expense (A and D). Alternative formula for calculating VA looks like the following:

$$VA = OP + EC + A + D$$

Inputs for the calculation of VAIC are to be found in the income statement and balance sheet of enterprises. It is important to note that staff costs are added back to operating profit because they are seen as an investment, not an expense, and are a kind of property. According to this method, IC is composed of human and structural capital. The author believes that these two elements contribute most to the creation of VA within the enterprise, without taking into consideration external (market) value of the enterprise, as well as the aspect of relational capital. In addition, VAIC is a measure of the contribution, and does not measure the absolute value of its tangible and intangible assets. Therefore, VAIC is the sum of the efficiency of human, structural, and physical capital in the creation of VA.

The first element of VAIC is the coefficient of human capital efficiency (HCE). HCE calculation starts from all forms of employee benefits (compensations). In calculating the human capital efficiency of the enterprise, a ratio between generated value added and investments in human resources is used:

$$HCE = VA/HC$$

HC is human capital, which includes the total earnings of employees during the fiscal year. The next component of IC, structural capital, is represented by the existing hardware, software, organizational structure, patents, and

trademarks. The coefficient of structural capital efficiency (SCE) is obtained as follows:

$$SCE = SC/VA$$

The logic of calculating the contribution of structural capital presented by the above equation is explained by the fact that structural capital (indicated in the equation as SC) is obtained by subtracting the costs of human resources from VA. In other words, the SCE is a measure that is inversely proportional to HCE:

$$VA = HCE + SCE = VA/HC + SC/VA$$

According to the method, which was promoted by *Pulic*, the measure of IC effectiveness in the enterprise is the intellectual capital efficiency (ICE), which is calculated as the sum of human capital efficiency and structural capital efficiency:

$$ICE = HCE + SCE$$

Finally, the coefficient of capital employed efficiency (CEE) is calculated by the division of value added (VA) with a book value of net assets or equity. The following equation illustrates the calculation of this ratio, where the capital already invested in the company is labeled CE (capital employed):

$$CEE = VA/CE$$

Input for calculation of CEE is obtained from the balance sheets of an enterprise. The last step in the calculation is summing the values of intellectual capital efficiency coefficient and the coefficient of efficiency of physical capital in order to obtain the value for VAIC coefficient, i.e.:

$$VAIC = ICE + CEE, \text{ or } VAIC = HCE + SCE + CEE$$

VAIC coefficient indicates the amount of value created per monetary unit invested in tangible and intangible resources of the enterprise. The method of measuring the IC contribution to the process of value creation in the enterprise that *Pulic* introduced is gaining in popularity because of its simplicity, verifiability of data, and possibility of comparison between the performance of different companies and industries. An interesting fact is that the VAIC measurement method was accepted by the previous Department for Business, Enterprise, and Regulatory Reform (BERR) as well as by the Department for Innovation, Universities and Skills, which contributed to the model being seen as valid and significantly spread in professional and academic circles.

The most significant disadvantage of VAIC method is the fact that the inputs for the calculation are found in the financial statements of an enterprise, which indicates that this indicator measures the value created in the past, and does not measure the potential of value creation in the future. Another disadvantage of VAIC, and that goes for all other methods of IC measurement, is the inability of the model to include the synergy effects arising from the interaction between the various components of intangible assets. VAIC method clearly indicates the contribution of individual components of intangible assets to value creation. However, in practice, the various elements of intangible assets are in mutual interaction, making it impossible to accurately calculate the individual contribution to the creation of added value. In addition to these shortcomings, the model does not offer a solution for the analysis of creating added value for those companies that have losses. In these cases, the value for the VA and for all elements of VAIC (HCE, SCE, and CEE) would also have a negative value, which would result in useless analysis [13].

The last group of models for measuring IC is the one that relies on the collection of data regarding the elements of IC. Afterwards, resulting indicators are often presented in the form of a list of results (scorecard) or in the form of graphs. *Scorecard models* are similar to direct measurement methods, with the difference that in the scorecard model the monetary value of IC is not determined. Instead, these methods at best can create some composite IC index. Scorecard models can be easily applied to any organizational level. These methods use a "bottom-up" approach in identifying the elements of IC, which provides a more detailed, more accurate, and faster display of this category of assets, comparing to ROA or market capitalization methods. Since scorecard models do not provide a monetary value of IC, they are very suitable for use in the nonprofit sector, analysis of business units, government agencies as well as in environmental and social sciences. The main drawbacks of scorecard models are their contextual nature and identification of different types of IC from company to company, which makes any

comparison of performance in this regard more difficult. The main problem with the use of these models is the inability to connect them with tangible, financial, and operating results [51, pp. 248-249].

The impact of intellectual capital on corporate performance in Serbia

Numerous research studies have dealt with the influence of IC on the financial and market performance of enterprises. In most cases, it is concluded that there is a positive correlation between the components of IC and financial and market performance of companies. One such study was conducted by *Firer* and *Williams* [24] on a sample of 75 companies listed on the Johannesburg Stock Exchange. The study showed that during the period when the survey was conducted South Africa's economy still predominantly relied on the exploitation of natural resources and that enterprises there gained competitive advantage in that respect. Interestingly, a study conducted in Taiwan [12] indicated the positive impact of IC, denominated by VAIC, on the market and financial performance. A study conducted in Malaysia [26] dealt with the investigation of the efficiency of IC in the banking sector. The result of the study was that domestic banks are generally less efficient in the exploitation of IC compared to banks with the majority of foreign ownership.

Although the most common result of these research studies was that there is a positive correlation between the components of IC and other variables used in measuring performance, as well as the strong influence of the individual components of IC on selected measures of business performance, there are research studies in which it was shown that IC does not affect business performance significantly (regardless of industry in which they operate), despite a relatively large number of units in the sample. Table 1 provides an overview of several major studies of the relationship between IC and corporate performance, together with the presentation of the country/region where the research was conducted, a description and sample size, as well as findings pointing out whether the impact of IC on company performance is unequivocally demonstrated.

On the territory of the Republic of Serbia, six significant empirical studies were conducted on different samples and at different periods, with one important common characteristic – they all applied identical research methodology. In fact, studies have used the concept of measuring the efficiency of the use of IC through VAIC

Table 1: Summary of significant research studies on the impact of IC on corporate performance

No.	Authors	Year	Country/Region	Sample description	Sample size	Unequivocally confirmed
1.	Bontis et al.	2000	Malaysia	The sample was composed of companies in two industrial sectors, the survey was conducted using questionnaire	107	Yes
2.	Firer and Williams	2003	South Africa	Companies listed on the Johannesburg Stock Exchange	75	No
3.	Seleim et al.	2004	Egypt	Software companies	107	Yes
4.	Mavridis	2004	Japan	Banking sector	141	Yes
5.	Chen et al.	2005	Taiwan	Companies listed on the Stock Exchange, different industries	4,254	Yes
6.	Goh	2005	Malaysia	Banking sector, ten domestic, six foreign banks	16	Yes
7.	Kujansivu and Lonnqvist	2007	Finland	Covered 11 industries, regardless of company size	20,000	No
8.	Tovstiga and Tulugurova	2007	Russia	Technology-intensive enterprises	20	Yes
9.	Kamath	2007	India	Banking sector	98	Yes
10.	Tan et al.	2007	Singapore	Companies listed on the Stock Exchange	150	No
11.	Yalama and Coskun	2007	Turkey	Banks listed on the Istanbul Stock Exchange	18	Yes
12.	Moeller	2009	Germany	Business networks in Germany	100	Yes
13.	Ting and Lean	2009	Malaysia	Financial institutions	20	Yes
14.	Zeghal and Maaloul	2010	Great Britain	Companies in the sector of high technology and traditional service sector	300	Yes
15.	Diez et al.	2010	Spain	Companies with more than 25 employees	211	No
16.	Chiu et al.	2011	China	All companies from the Hong Kong Stock Exchange	333	Yes
17.	Maditinos et al.	2011	Greece	Companies from the four industries listed on the Athens Stock Exchange	96	No
18.	Clarke et al.	2011	Australia	Companies listed on the Australian Stock Exchange	2,161	No

coefficient. The analyzed empirical research studies conducted in Serbia are given in Table 2.

In the case of companies in the BELEX15 group, study also failed to demonstrate the existence of strong relationship between VAIC coefficient and corporate performance measured by return on equity (ROE), return on assets (ROA), and employee productivity (EP). In determining the nature and form of the relationship between ROE and ROA and changes in values of VAIC in the case of these 15 companies, only structural capital has significant impact on ROE. In addition to this, the impact of human capital on the productivity of employees was determined. In terms of banking sector in Serbia, there was a significant correlation between total assets, ROA, ROE, and EP, and all the components of IC. However, such a correlation was not identified in the case of Serbian banks' profitability. On the other hand, regression analysis lead to the conclusion that when banks in Serbia are concerned, structural capital has a dominant impact on corporate performance, while the EP was mostly affected by human capital. In case of the top Serbian exporters, similar to banks in Serbia, the strongest relative impact on financial performance (measured by ROE, ROA, and profitability) was exercised by structural capital efficiency. Human capital determines ROA and EP, while physical capital predominantly affected ROE and profitability.

Within two studies that treated the real sector and companies with the highest net profit in 2010 and 2011, strong enough link between IC and financial performance was not established. The results of these two studies suggest that business success, measured by net income, operating income and operating profit, is in no way determined by the elements of IC. Unfortunately, this leads to the conclusion that commercial success is caused by factors that do not fall under the category of contemporary good practice. The current state of affairs in the Serbian economy reflects a situation in which corporate performance is influenced to a much lesser extent by certain specific knowledge and skills. In other words, the performance of companies still depends mainly on the physical assets of an enterprise, location value, and potential market position that have a tinge of monopoly (or oligopoly).

Table 2: Summary of significant research studies on the impact of IC on corporate performance carried out in Serbia

No.	Authors	Year	Sample description	Sample size	Unequivocally confirmed
1.	Janošević and Dženopoljac	2012	Companies with the highest trade rates on the Belgrade Stock Exchange (BELEX15), 2007-2010	15	No, among IC components, structural capital has the most significant impact on ROE and ROA; in contrast, human capital and physical capital have a weak influence on these two variables but strongly affect EP.
2.	Janošević and Dženopoljac	2011	Serbian companies in the real sector that achieved the highest net profits in 2010	100	No, IC has small or irrelevant impact on financial performance.
3.	Janošević et al.	2011	Serbian companies from the industrial sector that had achieved the highest net profits in 2011	100	No, business performance is mainly influenced by physical capital and a small amount by structural capital.
4.	Janošević and Dženopoljac	2012	Serbian top performing companies in terms of export in 2011	300	No. The study confirmed that return on assets is under significant impact of human capital component as well as structural capital segment of VAIC. Human capital also influences employee productivity. In addition, structural capital significantly determines the values of return on assets and profitability, while capital employed efficiency affects return on equity and profitability.
5.	Bontis et al.	2013	Serbian banking sector, 2008-2011	33	No. Human capital influences only employee productivity. Structural capital plays important role in value creation that results in higher values of total assets and ROE. Finally, physical capital dominantly influences profitability and ROE.
6.	Dženopoljac	2010-2012	Companies from Belgrade Stock Exchange that made up the BELEX line index	54	Research showed that the elements of IC (human and structural capital) have a significant impact on two out of the three indicators of financial performance, whereas only human capital has a positive impact on market performance. Conversely, the impact of physical capital is evident only when we look at the market performance of the listed companies. In terms of financial performance, physical capital determines only the return on equity.

In the case of research conducted on a sample of 54 companies that constitute BELEXline index of Belgrade Stock Exchange, the results revealed that there was positive impact of human capital on market performance, while the impact of structural capital was statistically insignificant. This implied that the knowledge, skills, enthusiasm, talent, and other elements of human capital determined the market performance expressed by MB (Market-to-Book) ratio. On the other hand, physical capital also plays an important role in achieving market performance of companies in Serbia. It is important to note that the impact of physical capital is more significant than the impact of human capital. Thus, the largest relative contribution to the creation of value has physical capital, and secondly human capital.

The BELEXline survey results, as in the case of market performance, showed that the human capital coefficient significantly affects financial performance, measured by ROA and EP. Statistically significant impact of human capital on ROE was not determined. When it comes to the impact of structural capital on financial performance, the study demonstrated statistically significant impact of this element of IC on ROE and ROA. However, the impact of structural capital is stronger with ROE, but the regression model in the case is of lower quality. When observing ROA, the model fit is higher but the impact of structural capital is less intense. On the other hand, employee productivity is independent of structural capital. Physical capital significantly affects ROE, while the impact on ROA and EP is not determined. It is also important to note that the impact of physical capital on ROE is reciprocal. In other words, the lower the physical capital efficiency ratio, ROE increases. Finally, the overall conclusion of the research is the observation that the elements of IC (human and structural capital) have significant impact on two out of three indicators of financial performance, while only human capital determines market performance. On the other hand, there is significant influence of physical assets, but only in the case of one out of three indicators of financial performance, whereas the market performance is still under the influence of this component of VAIC.

Since all the above studies include return on equity (ROE) and return on assets (ROA) as the dependent variables, the impact of IC on corporate performance of investigated companies will be displayed through the two common denominators. The aim of this analysis is comparing statistically significant impact IC components on financial performance of enterprises in Serbia. Along with presenting the influence of components of IC on these rates of return, there will be an analysis of physical and financial capital impact on the defined indicators of financial performance. Figures 1 and 2 present mentioned comparative analysis, whereby the analysis of the impact of VAIC components on ROE is presented in Figure 1, and Figure 2 shows the impact of these components on ROA.

The results of the implemented research studies into the IC impact on ROE have several common characteristics. First, the influence of human capital efficiency on ROE is statistically insignificant in almost all studies, except in the case of the study conducted on the sample of 100 companies with the largest amount of net profit in 2010. Second, structural capital has statistically significant effect

Figure 1: The impact of IC on ROE

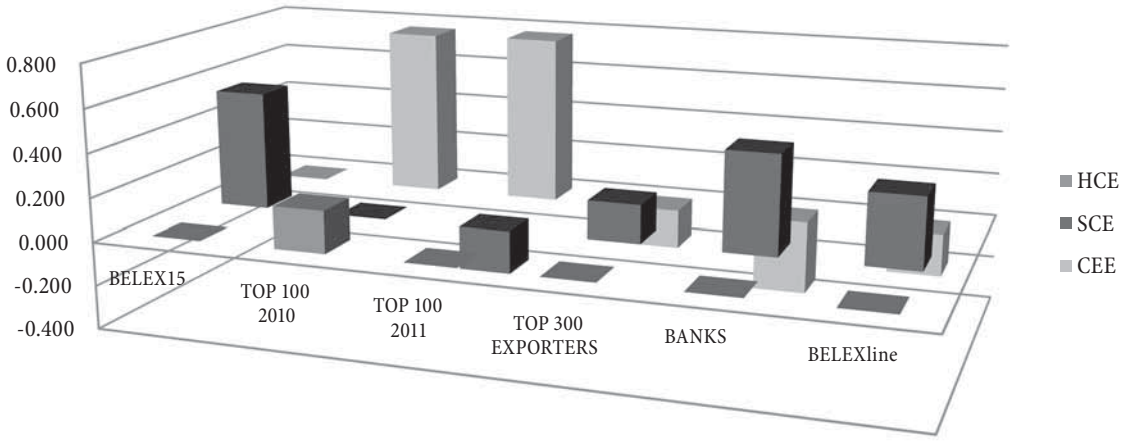
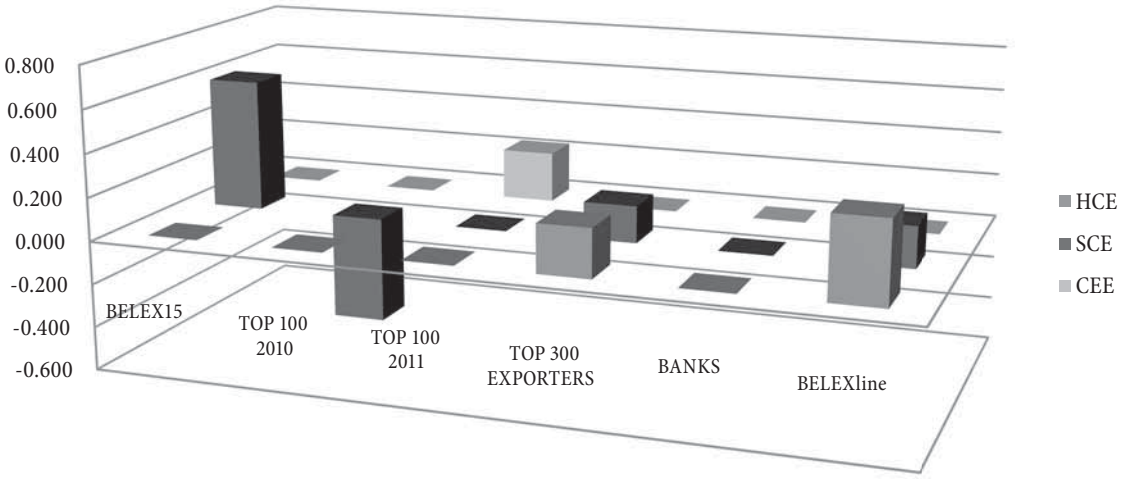


Figure 2: The impact of IC on ROA



on ROE in five out of six research studies. The only time that structural capital has not demonstrated significant impact on ROE is the case of 100 companies with the highest net profit in 2010. Third, the impact of physical and financial capital is significant in five out of six studies. We should note that in case of 300 largest exporters in Serbia, banking sector, and companies from the BELEXline group the IC impact on ROE is inverse. Only in the case of companies from the BELEX15 group, the impact of physical capital on ROE was irrelevant.

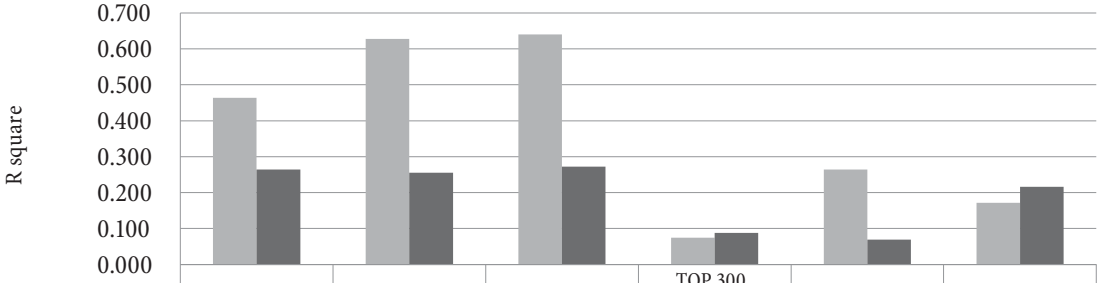
Figure 2 shows the influence of VAIC components on ROA and reveals somewhat different results, comparing to the IC impact on ROE. First, the impact of human capital on ROA is significant only in the case of the largest exporters and companies from BELEXline group. Second, structural capital plays an important role in the case of 15 companies that constituted BELEX15 index, 100 companies with the highest net profit in 2010, biggest exporters in Serbia, and companies from BELEXline group. Third, physical capital only significantly determined the value of ROA in case of 100 largest companies by net profit in 2011.

In order to support the results of these research studies in Serbia, Figure 3 gives a comparative view of the value of R^2 (R square), which describes the extent to which the selected independent variables (components VAIC coefficient) efficiently describe the change in dependent variables (ROE and ROA). Figure 3 shows that the regression models that entail ROE are on average more valid than those that analyze ROA.

In addition to the common dependent variables, presented empirical studies used other indicators of financial and market performance. Thus, in the case of companies in the group BELEX15, impact of IC on employee productivity was analyzed and the results suggested that this indicator was under significant impact of human and physical capital. In the case of companies that achieved the

Figure 3: Validity of regression models used in research studies

Model fit



	BELEX15	TOP 100 2010	TOP 100 2011	TOP 300 EXPORTERS	BANKS	BELEXline
R square (ROE)	0.464	0.628	0.640	0.074	0.264	0.172
R square (ROA)	0.264	0.255	0.272	0.088	0.069	0.216

highest net profit in 2010, the impact of IC on net income, operating income, and operating profit was investigated but a significant impact of components of VAIC coefficient was not determined.

For companies with the highest net profit of 2011 it was determined that structural and physical capital had significant impact on profitability. When discussing 300 largest exporters in Serbia it was revealed that human capital determined the productivity of employees, while structural and physical capital affect profitability. In the case of the banking sector, in addition to analyzing the impact of components of VAIC on ROE and ROA, the significant impact of human capital on employee productivity was implied, as well as the impact of structural capital on total assets, and physical capital on profitability. Finally, in the case of 54 companies from the BELEXline group, it was shown that components of human and physical capital determine the value of MB ratio, while only human capital significantly affects the productivity of employees.

Discussion and conclusion

Intangible resources of enterprises are the substance of IC, which is the primary driver of value in today's knowledge-based economy. The meaning of the term "immaterial" indicates that something is intangible, vague, difficult to define or understand, surreal and that it cannot be accurately measured. The nature of IC affects the complexity of its reporting and evaluation, especially determining its impact on corporate performance. There is no doubt that IC represents potential source of competitive advantage and future growth in value. However, it rarely directly affects the creation of value, thus the value that is created using IC is indirect. In order to enable the creation of value with IC, it is essential that it is properly defined, categorized, measured, accounted for, and connected with the strategy.

The various components of IC (knowledge, skills, talent and enthusiasm of employees, patents, know-how, software, databases, management processes, corporate strategies and plans, close relationships with customers, brand, unique organizational routines, corporate culture) can be categorized as human, structural, and relational capital. These different components of IC are related to each other as well as with the various components of physical and financial property.

Management of IC and research on its impact on corporate performance and, consequently, the value creation process, necessitate the measurement of IC. IC can be measured in several ways. First, one can identify the individual components of IC, assess their value based on pre-defined indicators, and thus determine the aggregate value of IC at the enterprise level. For the purpose of this kind of measurement the direct measurement methods were developed. Another way of measuring implies comparison of book value of an enterprise with its market value. If the market value is valued more than the book value of equity, this difference may be denoted as IC. Third, the size of the IC can be obtained by analyzing data from official financial statements. By analyzing certain items in the financial statements, which are treated as components of IC (such as goodwill, research and development costs, labor costs), and comparing them to the same positions of other companies, one can estimate the size and efficiency of the exploitation of IC. The application of VAIC coefficient is useful for this purpose because it analyzes the efficiency of IC and compares it with the efficiency of tangible assets in a single enterprise, with the ultimate goal of determining the relative contributions of these assets on value creation. Finally, it is possible to visually observe and monitor IC by using various scorecard models.

Besides definition, classification, and measurement, IC must be coupled with strategy to create added value. In order to connect IC with strategy, it is necessary to understand and properly display the feedback that exists between strategy and IC. Despite its conceptual logic and connection with IC, resource-based view of the firm shows the inability to indicate the ways in which it is necessary to mobilize, guide, and manage tangible and intangible resources in the process of value creation. Therefore, strategy, as the core planning decision, has the task to coordinate the aforementioned resources and focus them towards the realization of defined goals. The developed measurement models tend to allow the efficient and effective management of IC.

Numerous research studies have dealt with the relationship between IC and financial and market

performance of enterprises, with the aim of reviewing the contribution of IC to value creation. In most cases, it was shown that there was a positive correlation between the components of IC and financial and market performance. This was one of the reasons to analyze the results of the research studies conducted in Serbia in order to compare the results with the results of research conducted in other countries. Since Serbia is a country whose economy is not yet based on knowledge, the presented results are logical. The general conclusion that can be drawn is that IC is not the major driver of corporate performance of enterprises in Serbia. Still the corporate performance (in most cases) is significantly determined by physical and financial resources, rather than intangible ones.

The conducted research studies in Serbia open space for new research endeavors in the future. Firstly, research can go in the direction of creating quality measures of IC size and its efficient use in enterprises, which would have greater applicability in practice. Secondly, the question of IC influence on corporate performance represents an issue of great importance for the national economy as a whole, so future research can focus on determining the effectiveness of IC at the national level.

References

1. Afuah, A. (2009). *Strategic innovation: New game strategies for competitive advantage.* New York: Routledge.
2. Amit, R., & Schoemaker, P. J. H. (1993). Strategic assets and organizational rent. *Strategic Management Journal*, *14*, 33-46.
3. Andriessen, D., & Tissen, R. (2000). *Weightless wealth: Find your real value in a future of intangible assets*. Harlow: Pearson Education Limited.
4. Arbeitskreis Immaterielle Werte im Rechnungswesen der Schmalenbach-Gesellschaft für Betriebswirtschaft e.V. (2001). *Kategorisierung und bilanzielle Erfassung immaterieller Werte.*
5. Barney, J. B. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, *17*(1), 99-120.
6. Beaver, W. H. (1998). *Financial reporting: An accounting revolution.* Upper Saddle River, NJ: Prentice-Hall International.
7. Bontis, N. (1998). Intellectual capital: An exploratory study that develops measures and models. *Management Decision*, *36*(2), 63-76.
8. Bontis, N. (2001). Assessing knowledge assets: A review of the models used to measure intellectual capital. *International Journal of Management Reviews*, *3*(1), 41-60.
9. Bontis, N., Janošević, S., & Dženopoljac, V. (2013). Intellectual capital and the corporate performance of Serbian banks. *Actual Problems of Economics*, *4*, 287-299.
10. Bontis, N., Keow, W. C. C., & Richardson, S. (2000). Intellectual capital and business performance in Maysian industries. *Journal of Intellectual Capital*, *1*(1), 85-100.
11. Brooking, A. (1997). *Intellectual capital: Core asset for the third millennium enterprise*. London: Thomson Business Press.
12. Chen, M., Cheng, S., & Hwang, Y. (2005). An empirical investigation of the relationship between intellectual capital and firms' market value and financial performance. *Journal of Intellectual Capital*, *6*(2), 159-176.
13. Chiu, S. K. W., Chan, K. H., & Wu, W. W. Y. (2011). Charting intellectual capital performance of the gateway to China. *Journal of Intellectual Capital*, *12*(2), 249-276.
14. Choong, K. K. (2008). Intellectual capital: Definitions, categorization, and reporting models. *Journal of Intellectual Capital, 9*(4), 609-638.
15. Clarke, M., Seng, D., & Whiting, R. H. (2011). Intellectual capital and firm performance in Australia. *Journal of Intellectual Capital*, *12*(4), 505-530.
16. Corrado, C., Hulten, C., & Sichel, D. (2006). *Intangible capital and economic growth* (Finance and Economics Discussion Series No. 24). Washington, DC: The Divisions of Research & Statistics and Monetary Affairs, Federal Reserve Board.
17. Crasselt, N., & Schremper, R. (2000). *Economic Value Added*. DBW, Anaheim, CA, DB, Heft 19.
18. Diez, J. M., Ochoa, M. L., Prieto, M. B., & Santidrian, A. (2010). Intellectual capital and value creation in Spanish firms. *Journal of Intellectual Capital*, *11*(3), 348-367.
19. Đuričin, D., Janošević, S., & Kaličanin, Đ. (2013). *Menadžment i strategija* (osmo prerađeno i dopunjeno izdanje). Beograd: Centar za izdavačku delatnost Ekonomskog fakulteta u Beogradu.
20. Dženopoljac, V. (2013). *Uticaj nematerijalne aktive preduzeća na proces stvaranja vrednosti* (doktorska disertacija). Kragujevac: Ekonomski fakultet.
21. Edvinsson, L. (1997). Developing intellectual capital at Skandia. *Long Range Planning*, *30*(3), 320-331.
22. Edvinsson, L., & Malone, M. S. (1997). *Intellectual capital: Realizing your company's true value by finding its hidden brainpower.* New York: Harper Business.
23. Feltham, G. A., & Ohlson, J. A. (1996). Uncertainty resolution and the theory of depreciation measurement. *Journal of Accounting Research*, *34* (2), 209-234.
24. Firer, S., & Williams, M. (2003). Intellectual capital and traditional measures of corporate performance. *Journal of Intellectual Capital*, *4*(3), 348-360.
25. Giuliani, M., & Marasca, S. (2011). Construction and valuation of intellectual capital: A case study. *Journal of Intellectual Capital, 12*(3), 377-391.
26. Goh, P. C. (2005). Intellectual capital performance of commercial banks in Malaysia. *Journal of Intellectual Capital*, *6*(3), 385-396.
27. Grant, R. M. (1991). The resource-based theory of competitive advantage: Implications for strategy formulation. *California Management Review*, *33*(3), 114-135.
28. Hall, R. (1992). The strategic analysis of intangible resources. *Strategic Management Journal*, *13*(2), 135-144.
29. IASB. (2004), *Intangible assets* (International Accounting Standard (IAS) No. 38). London: International Accounting Standards Board.

30. Jalava, J., Aulin-Ahmavaara, P., & Alanen, A. (2007). *Intangible capital in the Finnish business sector 1975-2005* (ETLA discussion paper No. 1103). Retrieved from http://www.etla.fi/files/1866_Dp1103.pdf
31. Janošević, S., & Dženopoljac, V. (2011). Intellectual capital and financial performance of Serbian companies in the real sector. *Ekonomika preduzeća*, *59*(7-8), 352-366.
32. Janošević, S., & Dženopoljac, V. (2012). An investigation of intellectual capital influence on financial performance of top Serbian exporters. *Ekonomika preduzeća*, *60*(7-8), 329-342.
33. Janošević, S., & Dženopoljac, V. (2012). Impact of intellectual capital on financial performance of Serbian companies. *Actual Problems of Economics*, *7*, 554-564.
34. Janošević, S., Dženopoljac, V., & Tepavac, R. (2012). Corporate performance driven by intellectual capital: An empirical analysis. In D. Tipurić, & M. Dabić (Eds.), *Management, governance, and entrepreneurship – New perspectives and challenges* (pp.136-153). Darwen, UK: CIRU Governance Research and Development Centre & Access Press.
35. Kamath, G. B. (2007). The intellectual capital performance of Indian banking sector. *Journal of Intellectual Capital*, *8*(1), 96-123.
36. Kujansivu, P., & Lonnqvist, A. (2004). *The value and efficiency of intellectual capital in Finnish companies*. Tampere: Institute of Industrial Management, Tampere University of Technology.
37. Lev, B. (2001). *Intangibles: Management, measurement, and reporting*. Washington, D.C.: Brookings Institution Press.
38. Lev, B. (2003). Remarks on the measurement, valuation, and reporting of intangible assets. *Economic Policy Review*, *9*(3), 17-22.
39. Maditinos, D., Chatzoudes, D., Tsairidis, C., & Therious, G. (2011). The impact of intellectual capital on firms' market value and financial performance. *Journal of Intellectual Capital*, *12*(1), 132-151.
40. Marrano, M. G., Haskel, J., & Wallis, G. (2007). *What happened to the Knowledge Economy? ICT, intangible investment and Britain's productivity record revisited* (Working Paper no. 603). Retrieved from http://www.econ.qmul.ac.uk/papers/doc/wp603.pdf
41. Mavridis, G. D. (2004). The intellectual capital performance of the Japanese banking sector. *Journal of Intellectual Capital*, *5*(1), 92-115.
42. MERITUM. (2002). *Guidelines for managing and reporting on intangibles*. Madrid, Spain: Measuring intangibles to understand and improve innovation management (MERITUM).
43. Moeller, K. (2009). Intangible and financial performance: Causes and effects. *Journal of Intellectual Capital, 10*(2), 224-245.
44. Mouritsen, J., Larsen, H. T., & Bukh, P. N. D. (2001). Intellectual capital and the 'capable firm': Narrating, visualising and numbering for managing knowledge. *Accounting, Organization and Society*, *26*(6/7), 735-762.
45. Nakamura, L. (2000). Economics and the new economy: The invisible hand meets creative destruction. *Federal Reserve Bank of Philadelphia Business Review*, July/August, 15-30.
46. Ohlson, J. A. (1995). Earnings, equity book values, and dividends in equity valuation. *Contemporary Accounting Research*, *11*(2), 661-687.
47. Prahalad, C. K., & Hamel, G. (1990). The core competence of the corporation. *Harvard Business Review*, May-June, 79-91.
48. Pulic, A. (1998). *Measuring the performance of intellectual potential in knowledge economy*. Retrieved from http://www.vaic-on.net/
49. Pulic, A. (2002). *Value creation efficiency of Croatian banks 1996-2000*. Retrieved from http://www.vaic-on.net/
50. Pulic, A. (2004). Intellectual capital: Does it create or destroy value? *Measuring Business Excellence, 8*(1), 62-68.
51. Roos, G., Pike, S., & Fernström, L. (2005). *Managing intellectual capital in practice*. Oxford: Butterworth-Heinemann.
52. Seetharaman, A., Teng Low, K. L., & Saravanan, A. S. (2004). Comparative justification on intellectual capital. *Journal of Intellectual Capital*, *5*(4), 522-539.
53. Seleim, A., Ashour, A., & Bontis, N. (2007). Human capital and organizational performance: A study of Egyptian software companies. *Management Decision*, *45*(4), 789-801.
54. Stewart, T. A. (1998). *Intellectual capital: The new wealth of organizations*. London: Nicholas Brealey Publishing.
55. Sullivan, P. H. (2000). *Value-driven intellectual capital: How to convert intangible corporate assets into market value*. New York: John Wiley & Sons, Inc.
56. Sveiby, K. E. (1997). *The new organizational wealth: Managing and measuring knowledge-based assets*. San Francisco: Barrett-Kohler.
57. Tan, H. P., Plowman, D., & Hancock, P. (2007). Intellectual capital and financial returns of companies. *Journal of Intellectual Capital*, *8*(1), 76-95.
58. Ting, I. W. K., & Lean, H. H. (2009). Intellectual capital performance of financial institutions in Malaysia. *Journal of Intellectual Capital, 10*(4), 588-599.
59. Tovstiga, G., & Tulugurova, E. (2007). Intellectual capital practices and performance in Russian enterprises. *Journal of Intellectual Capital*, *8*(4), 695-707.
60. Yalama, A., & Coskun, M. (2007). Intellectual capital performance of quoted banks on the Istanbul stock exchange market. *Journal of Intellectual Capital*, *8*(2), 256-271.
61. Zéghal, D., & Maaloul, A. (2010). Analyzing value added as an indicator of intellectual capital and its consequences on company performance. *Journal of Intellectual Capital*, *11*(1), 39-60.

Vladimir Dženopoljac

is an Assistant Professor at the Faculty of Economics, University of Kragujevac, on courses of Strategic management and Business planning and policy, at the bachelor level of studies. At the master degree of studies, he is engaged as an Assistant Professor for Business strategy. Until now, he has published a number of papers in his field of professional expertise, and has been involved in implementation of several projects for Serbian companies. Current areas of professional interest are intellectual capital management and strategic financial management.

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Amira Pobrić
University of East Sarajevo
Faculty of Economics
Brčko

MEASURING CUSTOMER PROFITABILITY: THE APPLICABILITY OF DIFFERENT CONCEPTS IN PRACTICE

Merenje profitabilnosti kupaca: primenljivost različitih koncepata u praksi

Abstract

Measuring customer profitability implies the quantification of the contribution of customers or customer groups to the company's financial performance, regardless of whether profit or net cash flow is used as financial output. The need for measuring customer profitability stems from the fact that each customer does not equally contribute to the profitability of the company. Customer profitability can be measured at the level of individual customers or groups of customers. Companies can calculate the contribution of customers to their current profitability or evaluate customers' ability to generate profits in the future by means of projecting revenues and costs (cash flow) that will be caused by customers in the forthcoming years of cooperation.

Bearing in mind that management accounting theory is predominantly focused on the development of new methods and techniques as well as on the improvement of already existing ones, and being aware that there is a frequent absence of consideration of the extent to which these methods have been accepted in practice, this paper will attempt to identify the level of acceptance of the methods for measuring customer profitability in business practice, to determine contingent factors that influence the companies' need for the application of these methods and to acknowledge the difficulties that companies experience in the process of their implementation and application.

Key words: *value creation, customer accounting, customer profitability, customer valuation, life cycle, contingent factors*

Sažetak

Merenje profitabilnosti kupaca podrazumeva kvantifikaciju doprinosa kupaca ili grupa kupaca finansijskim performansama preduzeća, bez obzira na to da li se kao finansijski autput koristi profit ili neto novčani tok. Potreba za merenjem profitabilnosti kupaca proizilazi iz činjenice da svaki kupac ne doprinosi podjednako profitabilnosti preduzeća. Profitabilnost kupaca se može meriti na nivou pojedinačnih kupaca ili na nivou grupa kupaca, pri čemu preduzeća mogu sagledati doprinos kupaca ostvarenju tekuće profitabilnosti preduzeća ili oceniti sposobnost kupaca da u budućnosti generišu profit kroz projektovanje prihoda i rashoda, tj. novčanog toka koje će kupci izazvati u toku narednih godina saradnje.

Imajući u vidu da je teorija upravljačkog računovodstva dominantno usmerena na razvijanje novih i unapređivanje postojećih metoda i tehnika i da često izostaje razmatranje u kojoj meri su ta teorijska dostignuća prihvaćena u praksi, u ovom radu nastojimo da utvrdimo kolika je zastupljenost metoda merenja profitabilnosti kupaca u poslovnoj praksi, šta određuje potrebu preduzeća za primenom ovih metoda i sa kojim poteškoćama se preduzeća suočavaju u procesu njihovog uvođenja i primene.

Ključne reči: *kreiranje vrednosti, računovodstvo kupaca, profitabilnost kupaca, vrednovanje kupaca, životni ciklus, situacioni faktori*

Introduction

Nowadays, most companies operate in a highly competitive business environment. This means that, on the supply side, there are a great number of providers that offer the same or similar products at the same or similar prices. On the demand side, there are well informed and demanding customers, characterized by a lack of commitment to any company or brand. Such characteristics of customers come from the fact that all of them have the opportunity to choose and, being well aware of it, they use this opportunity wholeheartedly. In these circumstances, the major challenge that companies face reflects in the problem of how to make themselves and their products/services different in the eyes of customers and other stakeholders. Only a distinctive difference that cannot be easily and quickly imitated by the competition can be a source of sustainable competitive advantage.

The possibilities of differentiation and achievement of competitive advantage solely through products have been pushed to their limits. Modern innovations in the field of products have been limited to finding different, better ways to meet specific needs. It is necessary to keep in mind that the time that elapses from the moment of product innovation to the moment of product imitation and introduction of improved versions, has been significantly shortened. Therefore, services offered alongside with products become an important weapon for fighting competition. If certain companies can meet customer needs better than competitors by adapting products and services to the customer-specific requirements, they will be able to achieve and sustain competitive advantage.

Taking into account that different customers have to be treated in a different way, careful customer management becomes imperative for contemporary businesses. Many companies have decided to develop long-term relationships with their customers by continuously creating and delivering customer value [16]. Creating value for customers means ensuring that the overall benefits customers receive by purchasing the product exceed the total costs incurred in the process of evaluating, acquiring and using of the product.

During the process of customer value creation, it is essential to be very careful in order to prevent that value creation costs exceed the company's benefits created by its customers. In this regard, customer value creation should be in function of creating shareholder value – that is, it should ensure that long-term relationships with customers are profitable for the company. Managing customer profitability allows simultaneous respect for the interests of both customers and shareholders, since it is not possible to achieve customer profitability if value for customers is not previously created as well as it is not possible to create shareholder value if customers did not previously create profit for the company. Understanding customer behavior and profitability, and the use of this information in order to effectively manage relationships with customers represent a key to competitive advantage.

The necessity of measuring customer financial performance

The company's commitment regarding the delivery of products and services aimed to fully meet customer needs, desires and demands is absolutely essential in order to create satisfied and loyal customers. We can say that the achievement of customer satisfaction and its increase has become one of the key strategic objectives of market-oriented enterprises. Although customers do not directly participate in the formulation of company's strategies, their expectations in the domain of product and services quality and reasonable prices, significantly affect the company's choice of strategic orientation. During the decision-making process, management considers the impact of the defined alternatives upon customer satisfaction, i.e. their decisions are influenced by the appropriate indicators of customer satisfaction and customer loyalty.

As the importance of customer satisfaction was increasing, the importance of meeting the shareholders' interests came into focus. On the global market, companies struggle not only to attract customers but to attract investors as well. This means that the company has to create value for the customers and the shareholders simultaneously. There is an opinion that the interests of customers and shareholders can be reconciled by creating satisfied

customers, i.e. that the growth in customer satisfaction and loyalty lead to an increase in the company's profitability, which is an essential prerequisite for the satisfaction of the shareholders' interests. Such beliefs are based on the premise that a high degree of customer satisfaction correlates with customer retention rates and customer loyalty. Customer loyalty consequently leads to the repetition of purchases and growth in revenues. Furthermore, it lowers customer's sensitivity to price elasticity and reduces marketing costs (costs of attracting new customers) through positive word-of-mouth advertising [13, pp. 2-3].

A connection between customer satisfaction and the profitability of a company has been attracting the attention of experts for quite some time. So far, numerous studies have been conducted with aim to empirically verify claims regarding causality of these two variables. The results of these studies proved to be contradictory. In a survey that covered 77 Swedish companies, *Anderson*, *Fornell* and *Lehmann* [1] discovered that customer satisfaction is positively associated with contemporaneous accounting return on investment. *Smith* and *Wright* [24] came up with the same result while they were studying companies operating in the field of personal computer industry. *Ittner* and *Larcker* [13] found not only that there was a relationship between customer satisfaction and profitability but that this relationship was relatively stable at different levels of customer satisfaction though it tended to diminish at high levels of customer satisfaction. *Banker*, *Potter* and *Srinivasan* [3], as well as *Foster* and *Gupta* [8], found that the correlation between customer satisfaction and enterprise profitability may be positive, negative and insignificant, depending on the approach used for measuring customer satisfaction. On the other hand, a study conducted by the auditing firm Arthur Andersen & Co. [2] in the field of food, toys/games, airlines, and automotive industry did not found correlation between customer satisfaction and company's profitability, while *Tornow* and *Wiley* [26] found that the increase of customer satisfaction reduces the profitability of a company.

All previous research, regardless of the conclusions derived on the connection between customer satisfaction and the profitability of a company, confirmed that the improvement in customer satisfaction increases sales volume and company's revenue. This means that the inconsistencies in the research results should be sought in the relation between customer satisfaction and company's costs. Specifically, increasing customer satisfaction and customer loyalty requires investments in relationships with customers by improving products and services, which significantly increase company's costs. It must be added that, in many industries, services offered in addition to product become the main weapon in the battle for customers. This is why companies offer customers a wide range of services which often cause high costs. This increase in costs often exceeds the effects of the aforementioned reductions of certain components of marketing expenses resulting from the increase in the level of customer loyalty. From this we can conclude that achieving customer satisfaction is a necessary condition for the profitability of enterprises because the absence of customer satisfaction can and would result in decrease in volume of sales and revenue. However, this is not a sufficient condition, since there is a risk that the costs of building customer satisfaction can exceed revenues that are generated by satisfied customers. Therefore, it is necessary to provide customer satisfaction, but in the profitable way.

In many companies, especially those that seek to achieve competitive advantage by satisfying specific customer needs, costs of serving individual customers can significantly vary because customers differ in terms of behavior and requests. These differences lead to disproportions in the field of revenues and expenses resulting from the cooperation with certain customers and, therefore, each customer does not equally contribute to the company's profitability [22, pp. 64-65]. Whether (and to what extent) will a customer contribute to creation of company profit depends on the type and quantity of the product that customers are buying, selling prices and the amount of the discount granted, on types of additional services customers use and the frequency of their use, on demands in terms of products customization, on mode, rate and quantity of delivery, speed of claims payment, etc.

Some people are inclined to believe that 20% of customers generate 80% of company's profits, while the remaining 80% of customers generate only 20% of profits. Examples of business practices show that this disproportion

might be much bigger and that some customers create huge losses for the company. In case of Swedish company *Kanthal*, *Kaplan* and *Cooper* [14, p. 185] found that 20% of the company's most profitable customers create 225% of profit, that 10% of customers create 125% of loss, and that the other 70% of customers do not deviate significantly from the break-even point.

In view of all the foregoing, it can be concluded that for a quality decision-making that will result in value creation for the most important stakeholders – customers and shareholder – the information on non-financial performance of customers are not sufficient enough. Management must have the information on whether a particular customer or group of customers created profit or loss for their company and in what amount. Such information enables management to allocate company's resources to those customers who can create the most value for the organization. By differentiating customers according to their contribution to the overall profit, companies have the opportunity to build long-term relationships with the customers that are profitable or have the potential to become profitable and leave unprofitable customers to their competitors.

Information regarding customer profitability can and need to be provided by management accounting because management accounting, through information support it offers, should function as a means for achieving the strategic goals of the company and we have already identified customer value creation as one of those goals. This means that customers must be subject to management accounting analysis. In addition to determining the profitability of product, product groups and business segments, management accounting should allow assigning revenues, expenses and results to the customers who are actually causing them.

Methods of measuring customer profitability

The concept of customer profitability is equally relevant to the theory and practice of management accounting and marketing, but this problem is much more present in the marketing literature [19]. A great interest of marketing theorists regarding measuring customer profitability can be explained by the fact that the profitability of customers demonstrates financial consequences of marketing activities. The ability to predict and measure the impact of marketing activities upon cash flow and shareholder value increases the importance and credibility of marketing department [12, p. 387]. Regardless of the attention focused on the concept of customer profitability, great confusions and contradictions in the field of marketing are present in case of customer profitability measurement. The root cause of confusion and contradiction lies in the field of defining methods for measuring customer profitability [9, pp. 827-829]. In response to these concerns, *Lisa McManus* and *Chris Guilding* [10, p. 46] offered an adequate systematization of customer profitability measuring methods. This systematization is especially accepted in management accounting literature and it encompasses:

- Customer Profitability Analysis,
- Customer Segment Profitability Analysis,
- Lifetime Customer Profitability Analysis and
- Valuation of Customers as Assets.

The methods of measuring customer profitability are the means of quantifying the contribution of an individual customer or a group of customers' to the financial performance of a company, regardless of whether profit or net cash flow is used as a financial output [12, p. 389]. The thing that all the aforementioned methods have in common is their purpose – identifying customers that create or destroy company's profits, but they differ in the object of measurement (individual customers or groups of customers) and in the time horizon (the previous or future periods).

Customer Profitability Analysis (CPA) determines the contribution of individual customers to company's profitability. CPA measures customer contribution to the firm's profits as the difference between revenues and costs (accrual based) that can be traced to a specific customer during a given period of time (e.g. annual basis or a quarter of a year). The specific thing about this method is the fact that is relatively easy to determine the revenue generated by a particular customer and the fact that problems arise in the field of determination of customer cost, due to the fact that only a small part of the costs in question can be directly assigned to a customer. This analysis can be

more or less sophisticated, depending on the types of costs and the way they are assigned to customers. Although based on the actual revenues and costs, the reliability of customer profitability established in this way depends on the characteristics of the applied costing system and its ability to assign the costs to customers who actually caused them.

The most reliable information about customer profitability is derived by using Activity Based Costing. This system has proved to be highly successful for allocating overhead costs to the customers who have actually caused them. This can be done by means of identifying the activities executed as a consequence of doing business with certain customers and recognizing resources consumed in the process of performing these activities. Traditional costing systems are not focused on collecting customer specific data. They are primarily designed to measure costs of products, product line, organizational parts and business functions. The fact that they do not recognize customers as a target to which the costs of enterprises should be traced, the traditional costing systems fail to capture a significant amount of costs incurred in, so called, downstream value chain activities, such as marketing, distribution and customer servicing [21, p. 238].

Customer Segment Profitability Analysis (CSPA) is similar to Customer Profitability Analysis. These two methods differ in the field of the object of an analysis. In the first case, the analysis is focused on customer segments while the second focuses on individual customers. The application of CSPA requires establishing customer segments. In case of final customers, customer segmentation is based on geographic, demographic, psychographic and behavioral variables while customer segmentation in business markets is based on general characteristics of organizational customers, nature of product application, key criteria for purchasing decision-making, procurement strategy, significance of purchases, etc. [27, p. 154]. Revenues and costs are assigned to the segments formed in this way. A substantial part of the costs assigned to the segments is direct in its character. The circle of direct costs is wider observed from the aspect of customer segments rather than from the aspect of individual customers [21, p. 240]. This is the reason why the application of this method reduces the time and resources required to conduct such an analysis.

CPA and CSPA provide historical data regarding the contribution of customers to achieving company profitability. These data may be useful for making business decisions only if they can be used to predict the future. Current i.e. historical customer profitability does not say much about customers' potential to generate future profits for a company. In order to manage customer relationships, it is necessary to project future financial benefits that customers will create for the company. To this end, Lifetime Customer Profitability Analysis (LCPA) and Valuation of Customers as Assets (VCA) have been developed.

Lifetime Customer Profitability Analysis is a method of measuring customer profitability where customer profitability is calculated in the way that revenues and expenses, i.e. cash flow that will be generated by customer during the years of cooperation, is projected for the individual customer. The next step requires discounting of profit or net cash flow to the current period. This method is applied for customers with whom companies intend to build long-term relationships. The name of this method is somewhat imprecise and over-ambitious, because projections of income and expenses (cash flow) cannot be performed for the entire period of the forthcoming cooperation with the customer. Specifically, it is extremely difficult to determine the length of customer life cycle and project income and expenses for a great number of years in advance because customer behavior is often subject to change. For this reason, the process of projecting individual customer profitability is carried out for the period in which it is possible to predict the future behavior of customers and the length of this period does not need to be the same for all customers.

The application of the method of Valuation of Customer as Assets rests on the belief that the investment in relationships with customers should not be seen only as a cost but as an investment as well, and that customers are the most valuable company's assets that should bring income, both in the present and in future periods. This method is largely based on LCPA. The financial value of an individual customer is determined by LCPA, while VCA determines the appropriate financial value of customer

segments or entire customer portfolio, as a sum of values of individual customers that make up customer segments or portfolio. Given the fact that LCPA can be based on cash or accrual basis, the value of customer as assets may be determined by projecting revenues and expenses or cash flow [9, p. 840], where the value of a customer as an asset represents present value of total profit or net cash flow that will be induced by customers which make given segment or portfolio.

The application of method of measuring customer profitability in business practices

The literature [18] highlights a number of advantages of measuring customer profitability. Possession of information about the profitability of customers represents a main prerequisite for improvement in quality in the field of management decisions-making. The information on whether a particular customer or group of customers in the current period generates a gain or loss for a particular company as well as the information on whether or not they have the potential to generate profits in the future, enables separating those customers that should be kept and with whom the company should build long-term relationships from the customers that should be gradually eliminated. The realization that all customers are not worthy of investment improves the quality of the organization's resource allocation. The decision on which customers should be kept in an existing form of cooperation and which relationships should be redefined in order to generate profits in the future can be based on the analysis of customer profitability. Information about customer profitability improve the quality of the decisions regarding selling prices, discount policies and service provisions, but they can also improve the bargaining position of a company in relation to its customers because they allow the management to convincingly defend offered prices and mix of services that create value for customers and do not threaten the profitability of the company.

Considering the benefits of the application of customer profitability measurements, the question that arises is whether these benefits are being recognized in business practice, i.e. to what extent are methods of measuring customer profitability applied in business practices. Before we try to answer this question, it should be noted that one of the main causes of the gap between theory and practice in management accounting, which is the field that is responsible for measuring customer profitability, is that the management accounting theoreticians do not deal enough with the existing situation in practice. They are primarily focused on the development of new and the improvement of already existing management accounting methods and techniques, and they often fail to consider the extent to which these theoretical developments are accepted in practice. The lack of consideration of the application of certain concepts and methods of management accounting in business practice may be associated with the difficulties that arise in the implementation of such research. These difficulties stem from the lack of interest or unwillingness of managers and management accountants to share their experiences in the field of application in practice or from their unreadiness to present to the researchers the reasons for the absence of particular concepts application in practice. Keeping all this in mind, it is not an unusual thing that, to this date, there have been relatively few studies aimed at analyzing the application and the experience in the application of the methods of measuring customer profitability. The obtained results are shown in Table 1.

In a survey that was conducted on a sample of major Australian companies in 2002 [10], it was found that the prevalence of methods of measuring customer profitability was much higher than the literature suggested. Specifically, measured on a scale from 1 (not used at all) to 7 (used largely), the average applicability of CPA and CSPA is above the mean on the used measurement scale, while the application of LCPA and VCA is below the mean. Five years later, the same methodology was applied to a sample of companies from New Zealand [15] and it was concluded that there was under-representation of all the methods compared to the results obtained on a sample of companies from Australia. During the new study in 2011 in New Zealand [25] almost identical results were obtained in the application of all four tested methods for measuring customer profitability as in the research from 2002 in Australia. These three studies are focused solely on the observation of methods for measuring customer

Table 1: Summary of the representation of method for measuring customer profitability in business practices

Authors	Year	Country	Scale Measurement	The representation of methods for measuring customer profitability			
				CPA	CSPA	LCPA	VCA
Guilding, C., McManus. L.	(2002)	Australia	Likert scale (from 1 to 7)*	4.03	4.12	2.64	2.58
Drury, C., Tayles, M.	(2003)	Great Britain	Dichotomous scale (yes or no)	76%			
Lord, B. R., Shanahan, Y. P., Nolan, B. M.	(2007)	New Zealand	Likert scale (from 1 to 7)*	3.98	3.70	2.37	2.58
Cadez, S., Guilding, C.	(2007)	Slovenia	Likert scale (from 1 to 7)*	4.00	-	2.72	1.97
Cinquini, L., Tenucci, A.	(2007)	Italy	Likert scale (from 1 to 5)**	3.57			
CIMA	(2008)	More countries***	Dichotomous scale (yes or no)	49%	49%	22%	-
Tanima, F., Bates, K.	(2011)	New Zealand	Likert scale (from 1 to 7)*	4.30	4.55	2.65	2.05
Holm, M.	(2012)	Denmark and Sweden	Dichotomous scale (yes or no)	38%			

* 1 – not used at all, 7 – used largely
** 1 – never used, 5 – always used
*** The survey includes the following countries: United Kingdom (41%), Ireland (17%), Malaysia (7%), South Africa (6%), Sri Lanka (6%), Australia (6%), U.S. (4%), Canada (4%), New Zealand (2%), Hong Kong (2 %), France (1%), Netherlands (1%) and other countries (2%).

profitability, while in other studies, whose results we will analyze, the application of the method for measuring customer profitability is investigated together with the application of other concepts of management accounting.

When it comes to the analysis of the representation of 16 methods and concepts of strategic management accounting among large Slovenian companies [4], it was found that CPA was in eighth place, behind Competitor Performance Appraisal, Competitive Position Monitoring, Strategic Pricing, Quality Costing, Benchmarking, Strategic Cost Management and Integrated Performance Measurement. LCPA is in the penultimate and VCA in the last place. Greater application from these methods in the Slovenian business practice has the Value Chain Costing, Target Costing, Attribute Costing, Brand Valuation, Competitor Cost Assessment and Life-Cycle Costing. The average use of the investigated methods for measuring customer profitability, measured by a scale from 1 to 7, approximately corresponds to that determined in a sample of Australian companies.

A similar research has been done on a sample of Italian companies [6]. The presence of almost the same methods and concepts of strategic management accounting was investigated as mentioned in the previous survey. The differences are reflected in the fact that, in comparison to the survey conducted in Slovenia, the representation of Brand Valuation was not studied, but the concept of Activity Based Costing/Management was involved. This study showed that Customer Accounting, which includes all methods and techniques to determine customer profitability, is the second most abundant concept of strategic management accounting among companies in Italy, after Attribute Costing. The average application of Customer Accounting is around mean value of used measurement scale (from 1 – never used, to 5 – always used).

In 2003, generally dealing with profitability analysis among the companies in the UK, *Drury* and *Tayles* [7] found that 76% of companies conduct some form of customer profitability analysis of which almost 50% does analysis on a monthly basis. It is interesting to mention the survey which Chartered Institute of Management Accountants (CIMA) was conducted among its members in 2008 [5]. Although the members of the Institute are spread across the world, about 60% of the respondents were from companies that are located in the UK and Ireland. The survey showed that nearly 50% of companies, that made sample in this way, apply CPA and CSPA and only 22% assess LCPA.

Finally, let just add that *Holm* [11], in a survey aimed at identifying the factors that influence the sophistication of customer profitability analysis, found that 38% of large Danish and Swedish companies, measured in revenues, were conducting customer profitability analysis.

Skimming the data presented on the distribution of methods for measuring customer profitability allows us to see that the historically oriented methods have satisfactory application, but the methods that involve projections of future customer profitability are neglected in practice. Unfortunately, this may mean that management accounting is still primarily historically oriented, although 15 years ago, *Kaplan* and *Cooper* [14, p. vii] pointed out that management accounting must change their orientation from being the passive reporter of the past to a proactive influencer of the future.

Although research suggests that methods that offer historical data on customer profitability have been used in large enterprises substantially, which are often the subject of such research, it does not say anything about the sophistication of the used methods. The sophistication of these methods and the quality of the information they provide are determined by the types of expenses that are allocated to customers and the way this costs allocation is performed. Customer profitability can be determined throughout the allocation of only direct cost to customers. This mode of determining customer profitability is acceptable only if the direct costs have a dominant participation in the total costs which customers cause with their requirements and behavior, and that is rare. Another option is the one where the revenues that come from customer are confronted with direct and overhead costs. The overhead costs are often allocated to customers by means of only one cost driver and that cost driver is usually sales volume. This way established profitability often gives a wrong picture of the contribution of individual customers or groups of customers to the profitability of a corporation because most of the costs are allocated to customers who absorb the largest volume of sales, although they do not necessarily cause the greatest extent of the cost. It is necessary to allocate overhead costs to customers by applying numerous cost drivers. This mode of allocating costs and determining customer profitability is possible with the use of Activity Based Costing. It is interesting that studies, in which in the addition to the methods for measuring customer profitability, the use of other methods and techniques of management accounting was determined, show that Activity Based Costing is less present in practice than historically oriented methods of measuring customer profitability. From this we can conclude that, within the management accounting systems of large enterprises, customers are identified as carriers not only of income but of costs and profits as well, but it remains unclear whether management accountants are able to offer quality, although only historic information on customer profitability to the management.

Taking everything the aforementioned into account, the question inevitably arises as to whether management accountants in our companies provide management with adequate information regarding customer profitability, or the relationships with customers are managed without the informational support that management accounting can offer. The research on the implementation of customer profitability measuring methods among our enterprises has not been conducted so far. It would be interesting to examine whether marketing managers and sales managers in our companies have a need for information about the customer profitability and how management accountants see their role in the creation of these information.

In our country (and in some other countries as well), management accounting is still mostly in the shadow of financial accounting. For this reason, it is expected that the potentials of management accounting in terms of providing information support regarding business decisions-making (including the decisions regarding customer management) are not being fully used in our enterprises. On the other hand, it is encouraging that the representation of methods for measuring customer profitability in Slovenia, as one of the former Yugoslav republics, does not deviate significantly from Australia, a country with developed accounting practices. We should bear in mind that, although the Slovenian economy as well as the economy of the other republics of former Yugoslavia, was state-planned 20 years ago, today, Slovenia has reached a higher level of development of market economy and corporate governance compared to other republics.

The influence of situational factors on the application of the methods for measuring customer profitability

The application of any concept or method of management accounting, including methods of measuring customer profitability, should not be seen outside the context in which the given concept or method is used, because there is no such management accounting system design which is applicable in all companies and in all conditions. In fact, the design of management accounting system – in terms of the selection of concepts, methods and techniques to be used – should be a reflection of the management information needs and those needs are the consequences of the conditions under which the management makes its decisions. This means that the characteristics of management accounting system depend on the situation a company is confronted to and that different concepts are not equally necessary for all companies. The circumstances that create requirements and assumptions for the application of some management accounting methods are called contingent factors, which, by their nature, can be internal or external.

When it comes to the concept of customer profitability, not only do contingent factors affect the decision on applying this concept, but they also determine the choice of method regarding measuring customer profitability and the degree of sophistication of selected methods. Contingent factors that are considered to be the most influential when it comes to making decisions concerning applying and the way of applying the concept of customer profitability are: size of the organization, degree of competition in the market, market orientation, number of customers which the company operates with and differences between customers in terms of income and costs they cause [18].

The size of an organization is a contingent factor that is often considered in the application of management accounting concepts. Numerous studies confirm that larger organizations apply more sophisticated methods of management accounting compared to smaller organizations [11, pp. 11-15]. *Nielsen*, *Bukh* and *Mols* [23, p. 276] confirmed on the example of Danish companies engaged in financial services, that the organization size affects the application of methods of measuring customer profitability and that, contrary to large companies, smaller companies rarely consider the possibility of applying these methods. The authors note that smaller companies do not have the need for more sophisticated management accounting methods as big companies do. Regardless of the fact that methods of measuring customer profitability are more commonly used among larger companies, it should not infer that the aforementioned methods are not useful in case of smaller companies. Smaller companies also have a need for information on the contribution of individual customers or groups of customers to overall profitability of the company but they usually lack the knowledge needed to determine the profitability of customers as well as the knowledge needed for using this information in making business decisions. For smaller companies, benefits from applying sophisticated management accounting concepts often cannot exceed the costs of their implementation, which is why the lack of their application occurs.

The next contingent factor that determines the application of methods for measuring customer profitability is the level of competition in the market on which the company operates. Under conditions of low competition (conditions of monopoly and state market regulation), there is no need to measure profitability at the level of customers because customers have limited possibilities for changing suppliers and also, fixed selling price and standardized offer significantly reduce the differences in the level of customer profitability. With the increase of competition, the need for differentiating products and services, compared to what competitors offer, also increases. The need to be different usually leads to an increase in number of products and services in the field of selling assortment and customer segmentation. The customization of products and services to specific customer requirements increases costs and the need for keeping track of expenses at the level of individual customers or groups of customers. Also, in the conditions of the strict competitiveness, enterprises make less profit and it is necessary to carefully identify and manage sources of profitability. Although empirical studies offer conflicting conclusions about the connection between the market competitiveness and the application of methods of measuring customer profitability [18, pp. 19-20], the previous explanation and the proven fact

that the market competitiveness affects the sophistication and external orientation of management accounting system [11, pp. 11-12], lead us to believe that an increase in the market competitiveness encourages the application of customer profitability concept.

Market-oriented companies are companies that are primarily focused on their customers. They base their competitive advantage on their efforts to meet customer needs better than their competitors. In order to achieve their defined goals they require external information and, primarily, information regarding customers. Conventional management accounting system is predominantly internally oriented. Such an orientation of management accounting can be a serious problem in companies that are highly market-oriented, but it can also create the need for redesigning management accounting system and introducing the concept of customer profitability. This means that it is expected the existence of a relationship between market orientation of the company and the application of customer profitability concept. Such a correlation is confirmed by the results of empirical studies [10], [15], [17] and [25] and thereby, not only do they confirm the impact of market orientation on the decision about the application of the customer profitability concept, but they also confirm that market orientation influences the choice of methods of measuring customer profitability and the level of sophistication of these methods as well. The companies that are market-oriented usually are committed to building long-term relationships with customers so that they are not satisfied only with information about the current profitability of customers, but they also need information about the future profitability in order to be able to allocate their resources. Also, investing in relationships with customers leads to higher discretionary marketing expenses, which usually cannot be detected by conventional costing systems. This situation requires that the measurements of customer profitability are based on sophisticated methods of calculating costs.

The number of customers that the company serves is, also, a factor that affects the application of the customer profitability concept. This situational factor determines the aggregational degree of customer profitability measures, i.e. it influences the decision on whether the profitability will be measured at the level of individual customer or at the level of group of customers. Although it would be good to know the current and the future profitability of each customer, in some situations it is not possible and necessary to measure the profitability of each and every one of them. Measuring profitability at the level of groups of customers should be applied in cases when the company does not have adequate information about individual customers and when marketing efforts are directed towards groups of customers, not towards individual customers. The need for greater aggregation of customer profitability measurements is particularly evident in terms of business with a large number of customers. The greater number of customers is, the more difficult it is to determine the profitability of individual customers and the costs of such an analysis substantially exceed the benefits.

The last of the considered situational factors that affects the application of methods of measuring customer profitability is the existence of differences in levels of income and costs between individual customers. It seems that the differences in the amount of costs, above all, represent a major reason for the application of these methods [18, p. 16]. The differences in the amount of costs are caused by the differences in behavior and requirements of individual customers. Customers use different services in addition to basic product and to different extent; they have different requirements regarding the customization and delivery of products, methods and speed of payment etc., which lead them to unevenly consume company's resources. On the other hand, differences in income are influenced by the type and quantity of products that customers buy, the amount of the selling prices and the amount of the discounts. Companies with no significant differences in the amounts of income and expenses that would lead to differences in the amount of profit generated by individual customers or the groups of customers do not need to apply the concept of customer profitability.

The obstacles in the process of application of methods of measuring customer profitability

When we talk about the application of methods of measuring customer profitability, in addition to the benefits that they bring and the conditions that create the need for their

use, we should highlight the difficulties that companies confront in the process of their implementation. Usually, there is great time distance between the decision to use the concept of customer profitability and the moment of manifestation of the benefits of measuring customer profitability and there is a number of requirements that must be met in order to successfully apply methods of measuring customer profitability.

The implementation of methods of measuring customer profitability undergoes several stages. The first step refers to getting the support of top management as well as marketing and sales managers for the application of customer profitability concept and providing financial and human resources required for its implementation. After that follows the determination of the way in which customer profitability will be measured. The next step is the collection of data regarding customers, especially information regarding revenues and costs that customers cause and information regarding all customers' characteristics, requirements and behavior that cause revenues and costs. This is followed by the transformation of collected data to timely and, for decision-makers, comprehensive information on the current or the future customer profitability. Then, in order to insure meaningfulness of the application of methods of measuring customer profitability, it is necessary to ensure the use of the information obtained about the customer profitability in making business decisions, i.e. managing relationships with customers. The last step (which at the same time represents the test of effectiveness of methods of measuring customer profitability) is the assessment of contribution of the application of these methods to the improvement of, primarily, financial performances of companies.

Enumerated phases of the implementation process are so intertwined that the failures in any phase can affect the overall effectiveness of the application of method of measuring customer profitability. For this reason, it is necessary to identify the obstacles that may arise during the implementation of the aforementioned methods. The most common obstacles are the lack of top management support, resistance to change, lack of knowledge and skills, problems in collection of the necessary data and the conflict between organizational units affected by the introduction of a new concept. These barriers arise in the implementation of almost all sophisticated concepts of management accounting, including the concept of customer profitability [20], [23].

The support of top management is crucial for the implementation of the concept of customer profitability. The lack of support, especially in the early stages, may threaten the continuation of implementation process. The absence of support may be caused by management conclusions that it is not the best moment to introduce the method in question because the organization has other priorities or that the organization already has the necessary information for appropriate customer relationship management. The fear of change often hides behind these attitudes. This fear is especially emphasized in organizations that operate well. In organizations where the satisfaction with the results is present, it is difficult to convince management and employees that a new way of measuring the performance of customers should be introduced, which, at the same time, requires a lot of time and resources. In such organizations, the usual attitude is presented in opinion that there is no need to change anything until the organization operates well. The fear of change may be present in companies that generate poor results, but in such organizations it is obvious that something needs to change if they want to improve the results.

A problem that may also occur during the introduction and application of methods of measuring customer profitability is the lack of knowledge needed to determine the profitability of customers. This problem often leads to resistance of employees towards introduction of a new way of measuring customer performances. The problem created by a lack of knowledge and skills is especially evident in the process of implementation of Lifetime Customer Profitability Analyses and Valuation of Customers as Assets. The lack of knowledge can be one of the main causes of inadequate implementation of these methods in practice. If there is a commitment of top management in terms of implementation of method of measuring customer profitability, this obstacle can be eliminated through education of employees who will work on the calculation of customer profitability, but also those who are supposed to, when making business decisions, use information about customer profitability.

Getting reliable information about customer profitability requires the precise allocation of revenues and costs to customers who actually cause them. For such allocation, it is necessary to possess variety of information about customers and, above all, about their requirements, behavior and characteristics that determine cost drivers. The collection of this data is often a problem in the process of application of methods of measuring customer profitability. The required data are collected in different parts of the organization. Every organization unit has its own information system, i.e. system for collecting and processing data and generating information. Those information systems are usually not integrated. Therefore, management accountants often find it difficult to get the necessary data that are collected in other parts of the organization. For the successful application of methods of measuring customer profitability, it is necessary to create an integrated information system within the entire organization with a single database accessible to employees at all organizational units.

Most of the data needed for the determination of cost drivers and the projection of customer profitability are collected within the departments of marketing and sales. Problems arising from the nonexistence of integration of the information systems of these functional areas and the accounting information system can be easily overcome if marketing and sales managers wholeheartedly support the use of methods of measuring customer profitability. Unfortunately, the use of the customer profitability concept often creates a conflict between marketing and sales departments, on one hand, and the accounting department on the other. This conflict usually occurs when marketing managers and sales managers are not involved in the design of the system of measuring customer profitability and when there is a fear that the customer profitability measurements will be used to assess performances and reward employees within these functional areas. Then, there is usually a certain amount of resistance regarding the usage of customer profitability measurements for making decisions.

Cooperating with marketing and sales managers in the process of designing the system of measuring customer profitability results in their commitment to the concept of customer profitability and, therefore, removes one of the obstacles in the process of its implementation. It also improves the quality of customer profitability measurements because these measurements should be adjusted to marketing and sales managers' information needs and that is the reason why their suggestions are extremely useful in the design phase. To prevent a possible conflict between these functional areas, when applying the concept of customer profitability, it is necessary to clarify the purposes for which the measurements of customer profitability will be used. Using customer profitability measurements for the purposes of assessing the performances and rewarding employees in marketing and sales departments is not justified. All employees in the organization must contribute to creating values for customers and shareholders, which reflects through customer profitability, so that the employees in the marketing and sales departments cannot be the only people responsible for meeting these objectives.

The aforementioned obstacles that may arise during the implementation of the concept of customer profitability are usually not present at all stages of the implementation. In the initial stages, the biggest problem is the lack of support of top management, marketing managers and sales managers. In the later stages, the issues related to the collection of data needed for measuring or projecting customer profitability come to the fore. The experiences of those who apply some of the methods for measuring customer profitability show that the obstacles that organizations encounter in the process of their implementation do not lead to the abandonment of the concept, but significantly reduce the use of customer profitability measures in the process of decision-making [23].

Conclusion

In order to successfully manage relationships with customers, it is not sufficient that the company's management possesses only non-financial customer performance information. Satisfaction and loyalty of customers indicate that the company creates value for customers but they say nothing about whether or not customers create value for the company. With the increase of customer satisfaction, company's sales volume and revenues increase as well,

but because of the possible increase in the cost of serving customers, i.e. the costs resulting from creating their satisfaction, the increased customer satisfaction does not necessarily lead to improved financial performance of companies. In order for the company to achieve and maintain mutually beneficial relationships with customers, it is necessary to measure customer contribution to the company's profitability.

The concept of customer profitability is the subject of interest of both management accounting and marketing. Although these problems are less prevalent in the literature on management accounting, it is expected that management accounting contributes to the development of the methodology of measuring customer profitability. Four methods for measuring customer profitability have been developed so far. They differ by the object of measurement (individual customers or groups of customers) and the time horizon (historically oriented or future-oriented).

Historically oriented methods of measuring customer profitability are more represented in business practices compared to the methods that involve projections of future customer profitability. This fact confirms that the management accounting remained primarily oriented towards the past. Unfortunately, most companies ignore the fact that current customer profitability usually does not say much about the potentiality of customers to generate profits for the company in the future. Although the methods used to measure the contribution of costumers to the profit of enterprise in the previous accounting period have satisfactory application, it is unclear to what extent management accountants in these companies supply management with adequate information on customer profitability, bearing in mind the complexity of the allocation of costs to customers who cause them.

When we consider the use of the concept of customer profitability, we must bear in mind that all companies do not have an equal need for information. The need to apply the methods of measuring customer profitability and the choice of methods, as well as the degree of sophistication of selected methods, are primarily determined by the size of the organization, the degree of market competition, market orientation of companies, number of customers which the company operates with and the differences between customers in terms of the amount of revenues and costs they cause.

The benefits of methods of measuring customer profitability are reflected in the quality of management decisions which are related to the customers who represent the main source of profitability of the company and its most valuable asset. Besides the benefits, during the usage of costumer profitability concept, companies are confronted to certain difficulties with regard to the lack of top management support, the resistance to change, the lack of knowledge and skills, the problems in collecting the necessary data and the presence of conflict between the accounting department and departments of marketing and sales. These barriers usually do not lead to the abandonment of the concept, but significantly reduce the use of customer profitability measurements in the process of business decision-making.

References

1. Anderson, E. W., Fornell, C., & Lehmann, D. R. (1994). Customer satisfaction, market share and profitability: Findings from Sweden. *Journal of Marketing*, *58*(3), 53-66.
2. Arthur Andersen & Co. (1994). *Customer satisfaction strategies and tactics.* Chicago: Arthur Anderson & Co.
3. Banker, R. D., Potter, G., & Srinivasan, D. (2000). An empirical investigation of an incentive plan that includes nonfinancial performance measures. *The Accounting Review, 75*(1), 65-92.
4. Cadez, S., & Guilding, C. (2007). Benchmarking the incidence of strategic management accounting in Slovenia. *Journal of Accounting & Organizational Change*, *3*(2), 126-146.
5. CIMA. (2008). *Corporate value creation: Customer value 2008 report*. CIMA Centre of Excellence.
6. Cinquini, L., & Tenucci, A. (2007). *Is the adoption of strategic management accounting techniques really "strategy-driven"? Evidence from a survey* (*MIPRA Paper No.* 11819). Retrieved from http://mpra.ub.uni-muenchen.de/11819/1/MPRA_paper_11819.pdf
7. Drury, C., & Tayles, M. (2003). *Profiting from profitability analysis in UK companies* (Bradford University Working Paper No 03/18). Bradford: Bradford University, School of Management.
8. Foster, G., & Gupta, M. (1997). *The customer profitability implications of customer satisfaction.* CA: Stanford Graduate School of Business.
9. Gleaves, R., Burton, J., Kitshoff, J., Bates, K., & Whittington, M. *(2008).* Accounting is from Mars, marketing is from Venus: Establishing common ground for the concept of customer profitability. *Journal of Marketing Management, 24*(7-8), 825-845.
10. Guilding, C., & McManus, L. (2002). The incidence, perceived merit and antecedents of customer accounting: An exploratory note. *Accounting, Organizations and Society, 27*(1-2), 45-59.

11. Holm, M. (2012, August). *A contingency-based survey of service complexity's and competition's influence on customer profitability analysis sophistication*. Paper presented at the American Accounting Association Annual Meeting and Conference on Teaching and Learning in Accounting, Washington.
12. Holm, M., Kumar, V., & Rohde, C. (2012). Measuring customer profitability in complex environments: An interdisciplinary contingency framework. *Journal of the Academy of Marketing Science*, *40*(3), 387-401.
13. Ittner, C. D., & Larcker, D. F. (1998). Are nonfinancial measures leading indicators of financial performance? An analysis of customer satisfaction. *Journal of Accounting Research, 36*(Supplement), 1-35.
14. Kaplan, R., & Cooper, R. (1998). *Cost & effect: Using integrated cost systems to drive profitability and performance*. Boston: Harvard Business School Press.
15. Lord, B. R., Shanahan, Y. P., & Nolan, B. M. (2007). The use and perceived merit of customer accounting in New Zealand. *Accounting Research Journal, 20*(1), 47-59.
16. Lovreta, S. et al. (2010). *Menadžment odnosa sa kupcima*. Beograd: Ekonomski fakultet u Beogradu & Datastatus.
17. Malmi, T., Raulas, M., Gudergan, S., & Sehm, J. (2004, April). *An empirical study on customer profitability accounting, customer orientation and business unit performance*. Paper presented at the European Accounting Association Congress, Prague.
18. McManus, L. (2011). *Accounting for customers: The impact of contextual factors and implications for management decision-making* (Discussion Papers Accounting, No. 2011-01). Gold Coast: Griffith Business School.
19. McManus, L., & Guilding, C. (2008). Exploring the potential of customer accounting: A synthesis of the accounting and marketing literatures. *Journal of Marketing Management*, *24*(7-8), 771-795.
20. McManus, L., & Guilding, C. (2009). Customer accounting adoption in Australian companies: A field study. *Accounting, Accountability & Performance, 15*(1), 33-69.
21. Milićević, V. (2003). *Strategijsko upravljačko računovodstvo*. Beograd: Ekonomski fakultet.
22. Milićević, V. (2011). Upravljanje profitabilnošću kupaca. *Ekonomske ideje i praksa*, *1*, 60-78.
23. Nielsen, J. F., Bukh, P. N. D., & Mols, N. P. (2000). Barriers to customer-oriented management accounting in financial services. *International Journal of Service Industry Management*, *11*(3), 269-286.
24. Smith, R. E., & Wright, W. F. (2004). Determinants of customer loyalty and financial performance. *Journal of Management Accounting Research, 16*(1), 183-205.
25. Tanima, F., & Bates, K. (2011). *The incidence and perceived managerial merit of customer accounting in New Zealand* (Working Paper No. 84). Wellington: Victoria University of Wellington.
26. Tornow, W. W., & Wiley, J. W. (1991). Service quality and management practices: A look at employee attitudes, Customer satisfaction and bottom-line consequences. *Human Resource Planning*, *14*(2), 105-115.
27. Veljković, S. (2009). *Marketing usluga*. Beograd: Centar za izdavačku delatnost Ekonomskog fakulteta u Beogradu.

Amira Pobrić

graduated in 2005 at the Faculty of Economics, University of East Sarajevo. She got master's degree in Financial Accounting Analysis in 2009 from the Faculty of Economics, University of Belgrade. Currently, she is a doctoral student at the Faculty of Economics, University of Belgrade and a Teaching Assistant at the Faculty of Economics, University of East Sarajevo.

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Marina Pepić
National Bank of Serbia
Belgrade

MANAGING INTEREST RATE RISK WITH INTEREST RATE FUTURES

Upravljanje kamatnim rizikom pomoću kamatnih fjučersa

Abstract

Due to the wide impact that interest rate changes have on business performance, it is very important to manage this type of risk. A large number of instruments can be used for protection against interest rate risk. Financial derivatives are a very simple way to minimize interest rate risk and therefore are extremely popular. The value of interest rate derivatives transactions in the world is increasing dramatically. Unfortunately, this is not the case in Serbia. In Serbia, interest rate derivatives market does not exist. Therefore, this paper aims to present to market participants one kind of interest rate derivative instrument – interest rate futures and to show how they can protect themselves against unwanted changes in interest rates with these instruments.

Key words: *futures, basis, hedge ratio, hedging strategies*

Sažetak

Zbog velikog uticaja koji promene kamatnih stopa imaju na uspešnost poslovanja, od izuzetnog je značaja adekvatno upravljanje ovom vrstom rizika. Postoji veliki broj instrumenata koji se mogu koristiti za zaštitu od kamatnog rizika. Finansijski derivati predstavljaju veoma jednostavan način minimiziranja kamatnog rizika, zbog čega su i izuzetno popularni. Vrednost transakcija kamatnih derivata u svetu se drastično povećava. Nažalost, to nije slučaj i u Srbiji. U Srbiji tržište kamatnih derivata ne postoji. Zbog toga ovaj rad ima za cilj da približi tržišnim učesnicima jednu vrstu kamatnih derivata – kamatne fjučerse i ukaže im na koji način se mogu zaštiti od neželjenih promena kamatnih stopa pomoću ovih instrumenata.

Ključne reči: *fjučersi, baza, hedž racio, hedžing strategije*

Introduction

Interest rate risk is the likelihood of adverse impact of changes in interest rates on income, cash flows, operating costs and economic value of institutions and it is one of the most significant risks in business. The great impact that changes in interest rates have on the business performance, the fact that every organization is more or less exposed to interest rate risk, as well as great volatility in interest rates in recent years, make interest rate risk one of the most significant risks that market participants face. The impact of interest rate risk depends largely on the value and the structure of balance sheet and off-balance sheet positions sensitive to changes in interest rates, the interest rate volatility and the time of exposure to risk. It is difficult to completely neutralize interest rate risk, but, because of its impact on the profitability and value of assets, it should be reduced to a minimum.

Market participants can use a number of instruments to hedge against interest rate risk. Financial derivatives (interest rate forwards/futures, options and swaps) are a very easy way to minimize interest rate risk and therefore are very popular. From year to year, turnover in interest rate derivatives markets in the world is increasing dramatically. However, this is not the case in Serbia. In Serbia, the

interest rate derivatives market does not exist. Therefore, this paper aims to present to market participants one kind of interest rate derivatives – interest rate futures and to show how they can protect themselves against unwanted changes in interest rates with these instruments.

Futures

A futures contract is a contract between two parties in which one agrees to buy/sell from/to the other a specified asset (security) at a specified price at a specified future date [3, p. 95]. Counterparty that has an obligation to sell on agreed future date has a short position in a futures contract, and a party that has an obligation to buy on the agreed future date has a long position in a futures contract.

The price at which the counterparties agree to transact is called the delivery price or futures price. The futures price is contracted to equalize the value of the contract for both sides to zero. Later, that value becomes positive or negative depending on the movements of prices of underlying assets. For example, if asset price rises sharply after the conclusion of the contract, the value of long position in the futures contract becomes positive, while the value of the short position becomes negative, and vice versa, if asset price falls after the conclusion of the contract the value of long position becomes negative and the value of short position positive.

Futures contacts are standardized, which means that counterparties can easily match. Also, futures contracts are tradable until the delivery date, which in turn results in great liquidity of the futures market.

Different financial instruments can underlie interest rate futures. The most common are futures on Treasury Bills, Eurodollar futures, and futures on government notes and bonds.

Treasury bill (T-bill) futures. T-bill futures contracts are based on 90 day Treasury bill with a face value of USD 1 million [4, p. 141]. Futures prices are quoted as indices that are a function of the discount rate. For example, if the discount rate is 8.32%, the futures price will be quoted as 91.68. The value of the futures is calculated according to the following formula [8, p. 114]:

The value of the futures =1,000,000*(1- discount rate *n/360) (1)

where n is the number of days (90 or 91 depending on the adopted convention).

As the size of the contract is USD 1 million, the smallest possible change in price of the futures of one base point corresponds to a value of the contract of USD 25.

Eurodollar futures. Eurodollar deposits are deposits in dollars in banks outside the U.S. Thus, Eurodollar deposits are the underlying instrument for the Eurodollar futures contacts. Maturity of these futures contracts is three months. As Eurodollar deposits are non-transferable, they cannot be used as collateral. Therefore, the settlement is in cash. As most of these deposits are linked to Libor, Eurodollar futures price is also linked to Libor. The nominal value is USD 1 million, and the price is quoted as index (100-Libor). Minimal change is a one basis point, or USD 25. Relationship between yield on the futures and the discount rate is expressed by the following formula [8, p. 117]:

Yield = discount rate / (1-discount rate * n/360) (2)

Determining the value of the contract is the same as with futures on Treasury bills.

Treasury note (T-note) futures. There are 2-year, 5-year and 10-year T-note futures. Remaining maturity for the 2-year T-note futures contact must be between 21 months and 2 years, for the 5-year between 4 years and 3 months and 5 years and 3 months, and for 10-years between 6 years and 6 months and 10 years. For 5-years and 10-years futures contracts par value is USD 100,000, and for 2-years USD 200,000. The price is in terms of par being 100. The minimal price fluctuation is 1/64 of 1% of the par value, or USD 15.625. The minimal price fluctuation for 2-years futures contract is 1/128 of 1% of the par value, or USD 15.625.

Treasury bond (T-bond) futures. The underlying instrument for T-bond futures contracts is hypothetical USD 100,000 par value 20-years 8% coupon bond with maturity of at least 15 years on the first day of the delivery month and noncallable in that period. Par value of the futures contract is USD 100,000. The futures price is quoted in terms of par being 100 [5, p. 363]. For example, 97-16 (97 and 16/32) means 97.5% of the par value, or USD 97,500. The minimal price fluctuation is 1/32 of 1% of

the par value, or USD 31.25 [4, p. 143]. As there is many bonds with other coupon rate than 8%, conversion factor is used to adjust the price to the price of the bonds that are actually being delivered.

The basis

The aim of hedging is to neutralize the risk associated with assets in the portfolio by adding a new asset in the portfolio. The initial assumption is that the price of futures contract changes when the price of the underlying assets changes. Success of hedging depends on the relation of the spot price and futures price of the assets. The basis for date t is the difference between the spot price and the futures price. Therefore, the basis is equal to [11, p. 909]:

$$B_{t,T} = S_t - F_{t,T} \quad (3)$$

where S_t is spot price on day t, and $F_{t,T}$ is futures price on day t.

The value of the basis on day 0 is known because the spot price and the futures price are known. Also, the value of the basis at the expiration of the futures contract should be zero, if the hedged asset and the underlying asset are the same [7, p. 53]. However, the value of the basis between these two dates is unknown. As time goes by, the spot price and the futures price do not change by the same amount, and the basis changes constantly. The uncertainty regarding how the basis will change is basis risk. The basis is very important for understanding the process of hedging. If the spot price rises faster than the price of the futures, the basis increases, becoming stronger. Strengthening of the basis improves the outcome of short hedge position, and worsens the outcome of long hedge position. If futures price rises faster than the spot price, the basis weakens. Weakening of the basis improves the outcome of long hedge position, and worsens the outcome of short hedge position.

Long hedge. Long position involves buying futures contracts in order to protect from interest rates falls. If an investor plans to purchase some assets (such as bonds), and expects decline in interest rates which will increase the cost of purchase, he can protect himself by buying futures. The decline in interest rates will increase the value of futures and will generate revenue based on the difference between current and future futures price, and thereby totally or partially neutralize loss from increased costs of buying bonds. Therefore, profit based on long futures positions is equal to [2, p. 412]:

$$P_{long} = -S_t + S_0 + F_t - F_0 \quad (4)$$

where P is profit, S_t – spot price of assets on day t, S_0 – assets price in the moment of futures buying, F_t – futures price on day t, F_0 – futures price in the moments of purchase. Profit is equal to the basis change:

$$P_{long} = B_o - B_t \quad (5)$$

where B_0 is basis value in the moment of futures purchase, and B_t – basis value on day t.

Suppose that investor knows that in six months he will have available USD 970,000 and plans to invest them in 3M T-bill with a nominal value of USD 1 million. Spot rate for 3M T-bill is 12%, while the 3M forward rate is 14% [8, pp. 138-139]. Investor fears that interest rates will fall by the time he receives funds and that USD 970,000 will not be enough to buy T-bill, and therefore decided to protect himself by buying futures on 3M T-bill. As 3M forward rate is 14%, the value of the futures contract is USD 965,000. After six months, the spot rate has fallen to 10%, and 3M forward rate to 12%. Investor now needs USD 975,000 for the purchase of 3M T-bill, or USD 5,000 more than six months ago. However, as the value of the futures rose to USD 970,000, the investor will make a profit of USD 5,000 on futures contract, which will completely neutralize the increase in costs for the purchase of T-bill.

Short hedge. A short hedge implies selling futures contracts. This strategy is used for protection against a possible rise in interest rates. If an investor owns an asset, for example, a 10-year T-bond, and fears that rising interest rates will diminish its value, he may protect himself by selling futures. In the case of rising interest rates, the value of bonds will fall, but the value of the futures will also fall and the investor will generate income on futures that completely or partially will neutralize loss on assets. This strategy is also used when an investor plans to borrow in the future and fears that interest rates will increase making borrowing more expensive.

Thus, the profit based on short futures positions will be equal [2, p. 412]:

$$P_{short} = +S_t - S_0 - F_t + F_0 \quad (6)$$

$$P_{short} = B_t - B_0 \quad (7)$$

Let's say that investor has 3M T-bill with a nominal value of USD 1,000,000 and current price of USD 975,000 (10%). However, he will need money in a month, so he is afraid that, in the meantime, interest rates will increase decreasing the value of the T-bill he owns. Therefore, he sales futures on Treasury bills. Currently the forward rate for 3M is 12%, and the value of the futures contract is USD 970,000. If in a month, the interest rate, according to investors' expectations, increases to 12%, the investor for T-bill would get only USD 970,000 instead of USD 975,000 (he would get if the interest rate remained 10%), or USD 5,000 less. However, as 3M forward rate will also increase to 14%, (the value of the futures contract would be USD 965,000) and investor will make a profit of USD 5,000 on futures contract, which will cover the loss on the sale of the T-bill.

Cross hedge. Cross hedging occurs when the hedged asset and the asset underlying futures contract differ by [8, p. 142]: 1) risk level, 2) coupon rate, 3) maturity, or 4) time period.

Let's say that an investor has decided to issue commercial paper with nominal value of USD 1 million in three months. Currently, 3M rate on investor's commercial paper is 17% [8, p. 142], so he would receive USD 957,500 by issuing commercial paper. As he expects interest rates to rise, the investor will, in order to protect himself from a possible rate increase, sell futures on Treasury bills. The rate on 3M futures on Treasury bills is 16%, and the value is USD 960,000. In three months, 3M rate on commercial paper has increased to 18% and the rate on 3M bills to 17%. Now, the investor would get USD 955,000 for commercial paper with a nominal value of USD 1 million or USD 2,500 less, but he would also make more profit on futures, because the value of the futures contract due to the increase in interest rates has fallen to USD 957,500.

The aim of hedging is, therefore, to eliminate the negative effects of interest rates movements. Complete hedge using futures implies that any change in the value of individual asset or portfolio is followed by change in the value of the futures in the same amount but in opposite direction. For example, fall in the value of the bond portfolio for USD 1 million should be offset by an increase in the value of futures contracts in the same amount in order to have successful hedge.

The hedge ratio

In the previous examples, the assumption was that the asset price and the futures price are equally sensitive to changes in interest rates. However, as changes in the asset price and the futures price do not have to be the same, in order to successfully hedge, it is necessary to determine the number of futures contracts needed to neutralize the change in the price of asset.

An indicator called the hedge ratio measures the interest rate sensitivity of underlying asset and futures. Hedge ratio is calculated by dividing the percentage change in the price of asset and percentage change in the futures price, or by the following formula [6, p. 109]:

$$HR = \%\Delta P_a / \%\Delta P_f \quad (8)$$

where $\%\Delta P_a$ is % price change of the hedged asset and $\%\Delta P_f$ – % price change of futures contract.

Hedge ratio is the number of futures contracts that must be transacted to offset the price volatility of an underlying asset. For example, if a 10% change in the asset price is associated with 5% change in the futures price, the hedge ratio will be 2, which means that the asset price is twice as volatile as futures price and that two futures contract must be transacted in order to hedge. Thus, ratio $\%\Delta P_a / \%\Delta P_f$ shows how the value of the underlying asset is changing in relation to a futures contract value. The bigger the change in the value of underlying asset in relation to a futures value (the bigger $\%\Delta P_a / \%\Delta P_f$ is), the bigger the hedge ratio is. Bigger hedge ratio means that more futures contracts will be needed for hedging.

Hedge ratio can also be calculated using the conversion factor, the value of the basis points, or duration. Using a conversion factor number of futures contracts is calculated by the following formula [6, p. 110]:

$$Number_of_futures_contracts = \frac{Par_value_of_bonds}{Par_value_of_futures} * Conversion\ factor \quad (9)$$

The value of the basis points shows changes in the value (price) of assets for one base point (0.01%) change in interest rate. Hedge ratio in this case is calculated according to the following formula [6, p. 111]:

$$HR = \frac{BPV_a}{BPV_f} * CF \quad (10)$$

where the BPV is the value of basis point, and CF is the conversion factor.

Using the concept of duration, hedge ratio is calculated by the following formula [1, p. 309]:

$$HR = \frac{TV_a}{TV_f} * \frac{D_a}{D_f} * \beta_{af} * CF \quad (11)$$

where TV_a is value of assets, TV_f – futures value, D_a – duration of assets, D_f – duration of futures contract, CF – conversion factor, and β_{af} – average change in interest rate of underlying asset for a given change in interest rate on futures contract.

Depending on the maturity of the assets underlying futures contracts, one can distinguish between short-term, medium-term and long-term hedging strategies.

Short-term hedging strategies

Interest rate futures with underlying short-term assets – Treasury bills futures and Eurodollar futures are used for neutralizing exposure to interest rate risk in the short term. These futures are helpful for hedging interest rate risk connected with the planned future investment, borrowing, and sale of assets.

Locking profit on planned investment. An investor, who knows he will have same free funds in the near future, will be afraid that in the meantime interest rates could fall, because if that happens he will earn less on planned investment. To ensure certain rate of return, he can buy futures contracts. If interest rates decrease, price of futures will increase, so he will profit on futures and fully or to a large extent compensate a drop in income from planned investment.

Suppose that an investor [2, p. 428] knows that in three months he will have available funds in the amount of USD 1 million and plans to invest them in Treasury bills. Currently, the discount rate for T-bills is 8.20%, and 3M forward rate is 8.94%. This means that an investor can expect to pay USD 977,400 (1-0.0894 * 91/360) for USD 1 million nominal value T-bill. The current price of futures on T-bills is 91.32 (the price of one contract is USD 978,300). Investor fears that in three months interest rates will fall and the price of T-bills rise. To eliminate the risk of interest rates decrease he should take a long position in the futures market. In three months, in line with the expectations of investor, market interest rates have fallen and the rate on Treasury bills is now 7.69%, while the futures price is 92.54. The investor buys T-bill, but he pays USD 980,561 or USD 3,161 more than he planned. However, due to the decline in interest rates the value of the futures contract rose by USD 3,050 to USD 981,350 almost completely neutralizing the increase in costs arising from changes in the price of T-bills. If interest rate increases, investor would have to pay less for T-bills, but he would also have loss on the futures. So hedging using futures does not allow to profit on positive market movements.

Locking borrowing costs. An investor, who plans to borrow in the future, will be afraid of a possible rise in interest rates since if that happens his loan will become more expensive. By selling futures contracts, an investor can eliminate this risk. If interest rates really increase in the meantime, futures price will fall, and he will profit on futures and fully or partially neutralize an increase in borrowing costs.

Suppose an investor [2, pp. 430-432] knows that in three months he will need funds in the amount of USD 10 million, which he plans to provide issuing a commercial paper with maturity of 180 days. Currently, forward rate for investor's commercial paper is 10.58% for maturity of 180 days. This means that the investor will get USD 9.471 million by issuing securities with a nominal value of USD 10 million. Current price of Eurodollar futures is 88.23 (the value of one contract is USD 970,575). Investor fears that in three months interest rates could rise, and his debt become more expensive, so he takes a short position by selling 20 Eurodollar futures. After three months, interest rates have risen and the rate on commercial paper is 11.34% for maturity of 180 days. The investor will receive USD 9.433 million by issuing commercial paper, or USD 38,000 less than he expected. However, the prices of Eurodollar futures have fallen to 87.47. Investor buys 20 futures contracts at 87.47 (USD 968,675) and sells them at the agreed 88.23 (USD 970,575) earning USD 38,000 (20*(970,575-968,675)).

Locking profit on asset. Suppose that an investor plans to provide funds he would need in three months by selling T-bills from his portfolio. Currently, 3M forward rate on Treasury bills is 8.94%. This means that an investor can expect to get USD 977,400 for the T-bill with nominal value of USD 1 million. However, as he fears that in the meantime interest rates could rise and the price of T-bills fall, the investor sells futures contracts. The current price of T-bill futures is 91.32 (or USD 978,059). In three months, interest rates have risen and the interest rate on T-bills is 9.43%, while the futures price is 90.83. Investor sells T-bill, but he gets only USD 976,163 or USD 1,237 less than he planned. However, due to rising interest rates, the value of futures contracts have fallen to USD 976,819, so he has a profit of USD 1,240 on futures, which is enough to fully neutralize the unwanted change in the prices of T-bills.

Intermediate and long-term hedging strategies

The purpose of the intermediate and long-term strategies is the same as the short-term, with the only difference that in the case of a purchase or sale of futures contracts, the underlying instruments are long-term instruments – T-notes and T-bonds.

Locking profit on planned investment. Suppose that an investor plans to invest USD 1 million, which will be at his disposal in three months, in 9-years 11 5/8 T-note with nominal value of USD 1 million [2, pp. 437-439]. The current price of the T-note is 97-28, or USD 978,750. Current price of T-note futures is 78 21/32, or USD 78,656.25. In order to protect himself against interest rate drop, the investor will buy 12 contracts (assuming that conversion factor and β are 1). After three months, the interest rates have fallen and the current price of 11 5/8 T-note is 107 19/32, so the investor needs USD 1,075,937.50 to buy it, or USD 97,187.50 more than three months ago. Current price of the T-note futures is 86 6/32, or USD 86,187.50. The investor has an income of USD 7,531.25 on futures contract, and USD 90,375 for 12 futures contracts, which neutralizes to the great extent the sum he has to pay more for T-note.

Locking profit on asset. Let's say that an investor has USD 1 million in T-bond whose current price is 101-00, and the market value USD 1,010,000 [2, p. 436]. However, he will need the funds in three months and he is afraid that in the meantime interest rates could rise and the value of his portfolio fall. To protect himself against drop in the value of the bond, he sells futures on T-bonds. The current futures price is 110-16, and value USD 110,500 per contract. If the duration of the bond is 6.9 years, duration of the futures 7.2 years, a conversion factor 1.12, and β 1, he would need 10 futures contracts (1,010,000/110,500*6.9/7.2*1.12=9.8). If in three months bond price falls to 98-16, its market value will drop to USD 985,000, and the investor will have a loss of USD 25,000. However, as interest rates rose, the futures prices will fall to 108-16. The value of the futures contract will be USD 108,500, which means that the investor will have a profit of USD 2,000 per contract, or USD 20,000 in total, which will significantly reduce the loss from the sale of bond.

Locking long-term borrowing costs. The investor plans to issue bonds with total nominal value of USD 5 million in three months [2, pp. 439-440]. Currently, the price of similar bonds issued earlier is 99-10. The market value of the portfolio, according to the current price, would be USD 4,965,625. The investor, however, fears that in the meantime, interest rates could rise and the cost of the bond issue. Therefore, he purchases futures. The current futures price is 68-11 (contract value is USD 68,343.75). If the duration of the bond is 7.22, duration of T-bond futures 7.83, he would need 67 futures contracts for hedging. In three months, the rates are in line with investor expectations, and the current price of his bonds is 90-24. Thus, the portfolio will have a market value of USD 4,537,500, which means that he would have USD 428,125 less than expected. However, futures price have fallen to 60-25, and the value of one contract is USD 60,781.25, so the investor will have a profit of USD 7,562.5 per contract, or in total USD 506,687.5, which is more than enough to cover losses on the bonds issue.

Advanced hedging strategies

Hedging a floating rate loan. When borrow at a variable rate which level is determined on the agreed future dates for the following period, an investor concerns about growth in interest rates from one period to another when interest rate is determined. The investor in this case has two possibilities. The first one is to sell a specified number of

futures contracts with different maturities that coincide with the period of establishing the rate on the debt. Upon maturity or closing positions, the investor will have profit on futures that will more or less neutralize rising costs. For example, if he takes a loan in December for a period of one year at a variable rate which is determined on a quarterly basis, the investor would sell 10 March futures contracts, 10 June futures contracts and 10 September futures contracts. This strategy is known as a *strip hedge* [1, p. 312].

Another option is to sell futures contracts whose maturity coincides with period of the loan, and to close his positions in a certain number of futures contracts every time when the interest rate for the next period is determined, because in this way the profit from futures will neutralize to greater or lesser extent growing borrowing costs. For example, if investor takes a loan in December for a period of one year at a variable rate which is determined on a quarterly basis, he should sell 30 September futures contracts since the last determination of interest rates will be in September. This strategy is known as a *stack hedge* [1, p. 312].

In the case of a parallel yield curve shifts both strategies give the same result. However, in the case of nonparallel shifts in the yield curve, stack hedge is not effective because it locks the first interest rate, while strip strategy allows locking the average interest rate. In addition, the stack hedge cannot be used for longer periods because it can happen that there are no available futures contracts with convenient maturity.

Suppose that an investor plans to borrow USD 10 million for a period of three months, and the interest rate for the month will be determined each first Friday in the month in the amount of 3M Libor plus 1% [2, pp.432-433]. The current 3M Libor is 9.68% so the interest rate for the first month will be 10.68% per annum. However, investor is afraid that in the next two months interest rates could rise, and hence his costs. To protect against interest rates increase, investor sells Eurodollar futures. The current futures price is 90.75, and the value of one contract is USD 976,875. In order to hedge risk in the second month, (interest rate for the first month is already known) investor sells three Eurodollar futures contracts (10,000,000/976,875*4/12=3.4). Investor also sells three futures contracts to neutralize the risk in the third month (10,089,000/976,875*4/12=3.4). Thus, he sells in total six futures contracts. After a month Libor rate has risen to 10.09%, so the interest rate for the second month will be 11.09%. Futures price is 90.47 and the value of the futures contract is USD 976,175. Investor will get from futures contracts USD 700 per futures contract, or USD 2,100 in total, which he uses partially to repay the loan. The basis for the calculation of interest for the second month will be the principal plus interest for the first month and minus the income from futures (USD 10,086,900). After another month, Libor has further increased to 10.79%, and the interest rate for the third month will be 11.79%. Futures price is 89.99, and the value of the contract USD 974,975. Investor gets from the remaining three futures contracts USD 1,900 per contract, or USD 5,700 in total, which he also uses to reduce his liability. By the end of the third month, the investor will have loan in the amount of USD 10,274,384, while without hedging the loan would be USD 10,282,280.

Macro hedge

All mentioned strategies for interest rate risk protection refer to the protection of the value of certain assets from adverse market movements. However, the investor may also try to protect the value of the entire portfolio instead of individual hedge from adverse movements in interest rates. In that case, it is macro hedge.

In Table 1 market value of assets is USD 100 million and average duration 2.70 years. Average duration of liabilities is 1.03 years. Duration gap is calculated according to the following formula [10, p. 628]:

$$DUR_{gap} = DUR_a - \left(\frac{P}{A} * DUR_p\right) \qquad (12)$$

where DUR_{gap} is duration gap, DUR_a – average duration of assets, DUR_p – average duration of liabilities, P – market value of liabilities, and A – market value of assets. Duration gap will be:

$$DUR_{gap} = DUR_a - \left(\frac{P}{A} * DUR_p\right) = 2.70 - \left(\frac{95}{100} * 1.03\right) = 1.72$$

Table 1: Duration gap

	Amount (USD million)	Duration (years)	Weighted duration (years)
Assets	100		
Cash	5	0.0	0.00
Securities	20		
Less than 1 year	5	0.4	0.02
1 to 2 years	5	1.6	0.08
Over 2 years	10	7.0	0.70
Residential mortgages	20		
Variable rate	10	0.5	0.05
Fixed rate	10	6.0	0.60
Commercial loans	50		
Less than 1 year	15	0.7	0.11
1 to 2 years	10	1.4	0.14
Over 2 years	25	4.0	1.00
Physical capital	5	0.0	0.00
		Average duration 2.70	
Liabilities	95		
Checkable deposits	15	2.0	0.32
Money market deposit accounts	5	0.1	0.01
Savings deposits	15	1.0	0.16
CDs	35		
Variable rate	10	0.5	0.05
Less than 1 year	15	0.2	0.03
1 to 2 year	5	1.2	0.06
Over 2 years	5	2.7	0.14
Fed funds	5	0.0	0.00
Borrowings	20		
Less than 1 year	10	0.3	0.03
1 to 2 years	5	1.3	0.07
Over 2 years	5	3.1	0.16
		Average duration 1.03	

Source: [10, p. 626]

If he wants to protect himself against adverse interest rate movements, the investor should sell futures contracts because in that case if interest rate increase, the value of assets would decrease but this decrease would be offset by a profit from futures contracts. Let's say that 5-years T-bond futures with duration of 1.72 years are available in the market. In this case, the investor would need 1,000 futures contracts to protect against possible rise in interest rates.

$$Number_of_contracts = \frac{V_a}{V_f} * \frac{DUR_{gap}}{DUR_f} = \frac{100{,}000{,}000}{100{,}000} * \frac{1.72}{1.72} = 1{,}000 \quad (13)$$

where V_f is value of futures contract, V_a – market value of assets, DUR_f – average duration of bonds underlying futures, and DUR_{gap} – duration gap.

Interest rate increase from 10% to 11% will cause the change in the market value of net worth as a percentage of assets [10, p. 628] by:

$$\%NV = -DUR_{gap} * \left(\frac{\Delta i}{1+i}\right) = -1.72 * \frac{0{,}01}{1+0{,}01} = -1{,}6\% \quad (14)$$

Thus, when interest rate increases by 1%, from 10% to 11%, the value of the assets will be reduced by USD 1.6 million. The value of the futures contract (according to the same formula) will also be reduced by 1.6% or by USD 1,600 per contract. Total profit from futures contracts will be USD 1,600,000 (completely neutralizes the decline in net worth due to rising interest rates).

It is unlikely that the investor in reality will find futures on bonds whose duration is exactly the same as duration gap. However, this problem can be easily overcome by a combination of futures contracts on bonds of varying

duration so that the average duration of the portfolio is equal or close to duration gap.

Pros and cons of futures contracts

Futures contacts are standardized, which means that counterparties can easily match. Beside that, futures contracts are tradable until the delivery date, which in turn results in great liquidity of the futures market. In addition, credit risk is eliminated as the clearinghouses are mediators between buyers and sellers.

Although futures contracts are very useful for neutralizing the risk arising from adverse market movements, the biggest drawback of these financial derivatives is that they do not allow benefiting on positive interest rates movements.

Conclusion

Interest rate risk is the likelihood of adverse impact of changes in market interest rates on income, cash flows, operating costs and economic value of an organization. Thus, interest rate risk is one of the most significant risks.

Market participants in different ways can protect themselves from adverse changes in interest rates. Financial derivatives (futures, options, swaps) are a very easy way to manage interest rate risk or to reduce it to the lowest possible level and therefore are extremely popular. Moreover, the derivatives market has developed so much in recent years that market participants usually can find something that fully meets their needs.

Interest rate futures are contracts that specify interest rate to be paid or received on a certain future date. By fixing the interest rate that will be paid or received the uncertainty about the future level of interest rates and the potential loss in the event of adverse movements in markets are eliminated.

However, although they are good for protection against unwanted market movements, the major drawback of futures is that fixing the interest rates means not only protection from unwanted interest rate movements but also rejecting the possibility to benefit on positive.

References

1. Alexander, C., & Sheedy, E. (2004). *Volume I: Finance theory. Financial instruments and markets. The official handbook for the PRM certification*. Wilmington: PRMIA Publications.
2. Chance, D. (1998). *An introduction to derivatives and risk management* (4th ed). Fort Worth: Harcourt College Publishers.
3. Choudhry, M. (2005). *Fixed-income securities and derivatives. Analysis and valuation*. Princeton: Bloomberg Press.
4. Fabozzi, F. J. (1996). *Measuring and controlling interest rate risk*. New Hope: Frank J. Fabozzi Associates.
5. Fabozzi, F. J. (2007). *Fixed income analysis* (2nd ed). New Jersey: John Wiley & Sons.
6. Gulp, B. E., & Brooks, R. (1993). *Interest rate risk management*. Illinois: Bankers Publishing Company.
7. Hull, J. C. (2012). *Options, futures and other derivatives* (8th ed). England: Pearson.
8. Kolb, R. (1999). *Futures, options & swaps* (3rd ed). Cambridge. Mass: Blackwell Publishers.
9. Martellini, L., Priaulet, P., & Priaulet, S. (2003). *Fixed-income securities: Valuation, risk management and portfolio strategies*. Chichester. England: John Wiley and Sons.
10. Mishkin, F., & Eakins S. G. (2006). *Financial markets and institutions*. Boston: Addison-Wesley.
11. Reilly, F. K., & Brown, K. C. (2003). *Investment analysis and portfolio management* (7th Ed). Mason, Ohio: South-Western/ Thomson Learning.

Marina Pepić

graduated from the Faculty of Economics, University of Belgrade in 2004 and acquired MSc title in Economics at the same faculty in 2011. She has been working at the National Bank of Serbia since 2006, first as an economist in Analysis and Liquidity Forecast Division, and currently she holds the position of Assistant for Economic Issues at Governor's Office. Her professional expertise and interests refer to macroeconomics and monetary policy, banking, finance, and financial markets. She has published research papers covering these fields in national and international scientific journals and conferences.

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Žaklina Stojanović
University of Belgrade
Faculty of Economics
Department of Economic Policy and Development

Jelena Filipović
University of Belgrade
Faculty of Economics
Department of Business Economics and Management

CONSUMERS OF PRODUCTS WITH HEALTH CLAIMS IN THE WESTERN BALKANS: PRODUCERS' PERCEPTION AND REALITY[1]

Potrošači proizvoda sa zdravstvenom izjavom na Zapadnom Balkanu: percepcija proizvođača i realnost

Abstract

The study presented in this paper aimed to investigate how producers of functional foods comprehend their typical consumers in the Western Balkan countries and to what extent that perception differs from actual features of consumers of these products. Consumers sample included 3085 respondents, coming from six countries of the region. They were investigated by using face-to-face interviews, while stratified three-stage random sampling method was adopted in order to ensure nationally representative samples. Producers sample consisted of 29 companies, comprising all leaders in the sector of functional foods in the Western Balkans. They were examined through in-depth interviews. Results revealed that producers evaluate consumers' characteristics in a right manner concerning their age, income and education level, whereas their viewpoints on consumers family status, gender, and state of health failed to be corroborated by findings established by consumer survey. In addition, the Western Balkans consumers appear to contrast with their global counterparts in terms of gender and the importance of presence of children in the households. These conclusions suggest that producers need to modify their marketing communications in order to better address their targeted consumer segments. They should put more efforts in educating consumers about the benefits of the consumption of functional foods as well as in communicating with female population. Since this paper presents the first attempt to comprehend the validity of functional food producers' perception of their consumers in this region, it may be a valuable benchmark for future studies in the field.

Key words: *health claims, consumers, Western Balkans, functional foods*

Sažetak

Cilj rada je da istraži kako proizvođači funkcionalne hrane percipiraju svoje tipične potrošače na Zapadnom Balkanu, kao i u kojoj meri se ta percepcija razlikuje od stvarnih karakteristika potrošača njihovih proizvoda. Istraživanje je sprovedeno na uzorku od 3085 potrošača, sa teritorije šest država posmatranog regiona. Korišćena je tehnika ličnog intervjua, dok je primenjen troetapni stratifikovani slučajni uzorak kako bi se obezbedila nacionalna reprezentativnost uzoraka. U ispitivanju je učestvovalo i 29 kompanija, uključujući i sve lidere u sektoru funkcionalne hrane na Zapadnom Balkanu. U ovom slučaju je primenjena tehnika dubinskog intervjua. Rezultati su pokazali da proizvođači sagledavaju svoje potrošače ispravno u pogledu njihove starosti, dohotka i nivoa obrazovanja; dok njihova mišljenja o porodičnom statusu, polu i zdravstvenom stanju njihovih potrošača nisu bila potvrđena rezultatima istraživanja na uzorku potrošača. Pored toga, čini se da se potrošači funkcionalne hrane na Zapadnom Balkanu razlikuju od globalnih potrošača po polu i važnosti prisustva dece u domaćinstvu. Ovakvi rezultati navode na zaključak da bi možda proizvođači trebalo da prilagode svoje marketinške komunikacije kako bi na bolji način targetirali svoj ciljni segment. Trebalo bi i da ulože više napora u edukaciju potrošača o koristima koje se dobijaju konzumiranjem funkcionalne hrane, kao i u komunikaciju sa ženskom populacijom. S obzirom na to da ovaj rad predstavlja jedan od prvih pokušaja sagledavanja ispravnosti percepcije proizvođača funkcionalne hrane o njihovim potrošačima u ovom regionu, pretpostavka je da će biti dobra polazna osnova za buduće studije iz ove oblasti na ovim prostorima.

Ključne reči: *zdravstvene izjave, potrošači, Zapadni Balkan, funkcionalna hrana*

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Introduction

The market of functional foods continually rises [16], [2], attracting more attention of both practitioners and scholars. The Eastern European market has proven to be increasingly relevant for this product category [7]. In spite of this, it could be noted that there are a vast number of studies that tackled functional food market in developed countries (U.S. and EU mainly), while consumer behavior in this regard has remained understudied in emerging markets [17], [19], [5]. Several scholars [6], [11] called for attention with reference to this observation, emphasizing that European market is heterogeneous in terms of acceptance of functional foods and appraisal of their characteristics. Therefore, it can be concluded that it is necessary to conduct more research on this matter in developing countries and thus contribute to better understanding of the functional food consumption patterns and market potentials in those regions.

It can be argued that of numerous socio-demographic characteristics that have been examined in a broad range of studies undertaken on the subject of functional food consumption, just few of them proved to be significant. Nevertheless, research studies consistently point out that socio-demographic features have certain weight in explaining differences in acceptability and tendency to use functional foods [18], [2]. There is general consensus that female population demonstrates stronger purchase interest towards this kind of food [3], [12]. This fact is quite salient, bearing in mind that women are usually responsible for food purchasing in the households. Moreover, functional food users in Europe are often more educated and of higher economic status [9], [1]. However, in the domain of consumers' age there cannot be found such unanimity of opinions and findings. According to *Poulsen* [12] and *Urala* [15], elderly people (older than 55 years) are more willing to buy functional foods, which is opposite to the findings of *Childs* [3]. Another important socio-demographic attribute pertains to the presence of children in households [21], [19]. This finding may be explained in the way that the families with children potentially have higher risk aversion, while they also opt for fortified foods.

Studies [15], [10] consistently allege that one of the crucial motives for consumers to use functional foods is the preservation of good health status. With regard to the health claims (HC) as indications of functional foods, even though they are perceived to be useful [20], consumers are usually skeptical about their trustworthiness [19]. It should be noted that the knowledge of food and food ingredients contributes positively to the consumption of functional foods [4] and that more informed (i.e. knowledgeable) consumers understand better [8] benefits they could gain from a balanced diet. Indeed, as *Sun* [14] concluded, individuals' perception of their health status, health concerns and nutritional knowledge would affect the formation of their healthy eating attitudes, and consequently, their habits related to the use of functional foods.

Stemming from the overview of literature on this subject and observed research gaps, this study aimed to explore the producers' perception of functional food consumers, as well as the typical consumer profile, in order to establish the degree to which these two coincide and to suggest more effective marketing approach.

Research methodology

The research procedure included both qualitative and quantitative methods, depending on the target group that was examined.

Consumers were investigated through face-to-face interviews at respondents' homes. The sample included 3085 respondents, coming from six Western Balkan countries (WBC), namely: Bosnia-Herzegovina, Croatia, Former Yugoslav Republic of Macedonia, Montenegro, Serbia and Slovenia. The questionnaire was administered to approximately 500 respondents in each country, while stratified three-stage random sampling method was adopted, in order to ensure nationally representative samples. Respondents' personal characteristics are provided in Table 1.

In the introductory part of the survey it was explained to the respondents what it was meant by the term "products with HC" and some examples were given. We considered this to be important since some previous studies [17], [4] identified that consumers in various European countries

often are not familiar with the term of "functional foods" or related concepts (e.g. health claims). The formulation in the questionnaire was as following: "Health claims that we see on product packages are claims that link a nutrient to a normal functioning of the body or a specific disease. An example of a health claim – High in calcium, Calcium helps build strong bones. Adequate calcium throughout life, as part of a well-balanced diet, may reduce risk of the osteoporosis". Some pictures with products with HC (e.g. probiotic yoghurts, milk enriched with vitamins and minerals, etc.) were also provided, ascertaining respondent's better apprehension of this kind of the food.

Self-reported assessment was applied in responses to questions about: a) frequency of consumption, b) respondent's level of information on food with HC, c) whether participant perceives HC made on product labels to be useful, d) his/her state of health, e) standard of his/her household. For evaluation of the frequency of consumption 10-points scale was used, including subsequent items: more than twice a day, twice a day, once a day, once in 2-3 days, once a week, 2-3 times a month, once a month, several times a year, once a year or less, never. Answer modalities for the other questions can be observed in Table 1.

With regard to the producers, in-depth interviews were considered to be a right technique to apply. These interviews allow face-to-face discussion and yield valuable information about the consumption of these products. The questionnaire included generally open questions with combination of given list of answers in some cases (ranks or marks of main problems, difficulties, characteristics etc.), so that the discussion might be deepened on different topics. They were facilitated by a trained person and lasted approximately an hour. Totally 29 producers have been interviewed in all WBC. Given that 15 companies are leaders in studied categories in their countries, interviewed producers can be considered to be representative for the sector of functional foods.

Producers' answers were analyzed through the observation and description of typical statements, while in the case of consumers, multiple linear regression was run aiming to establish whether certain respondent's features affect his/her frequency of purchasing the products with HC. These results are accompanied with descriptive statistics, which should help to better understand the obtained data in regression analysis.

Table 1: Statistical features of the consumers' responses

Variant	Sample population	Percentage
Gender		
Male	1186	41.1
Female	1698	58.9
Age		
18-30	792	27.5
31-50	947	32.8
51-65	709	24.6
66 or above	436	15.1
Education		
Unfinished elementary school	639	22.2
Finished elementary school	69	2.4
Finished secondary school	1630	56.5
College or university degree	546	18.9
Standard of household		
Bad	438	15.2
Moderate	1474	51.1
Good	972	33.7
Children in household		
Yes	776	26.9
No	2108	73.1
State of health		
Very bad	41	1.4
Bad	209	7.2
Moderate	880	30.5
Good	1209	41.9
Very good	545	18.9
Body Mass Index		
Underweight (<18.4)	80	2.8
Normal (18.5 to 24.9)	1447	50.2
Overweight (25 to 29.9)	1034	35.9
Obese (>= 30)	323	11.2
Level of information		
Not informed at all	206	7.1
Very poorly informed	626	21.7
Moderately informed	1378	47.8
Very well informed	517	17.9
Fully informed	157	5.4
HC on products labels are useful		
Agree	2082	72.2
Disagree	802	27.8

Results and discussion

Producers' perspective

Producers' perception of the consumers of products with HC is quite identical in all WBC. Consumers are generally perceived to be women, belonging to the age groups of 15 to 40 years, or elder (40-64), with higher or middle income, secondary or high education, with or without health problems, living in urban areas. Moreover, they are mostly regarded as persons who practice a healthy life style, follow modern trends and fashion in food consumption, active (sportsmen, businessmen) or mothers who are expected to provide healthy food for their families.

However, several producers in each country also indicated men to be consumers of products with HC. Additionally, other age groups were also mentioned – particularly middle age and older people (from 40 to 64, 65+ to lesser extent) and in just a few cases the young population was also specified. Producers generally agree that the consumers of products with HC have higher or average income and live in urban or suburban areas. There are no explicit differences concerning this issue either by product categories or by the countries covered by the study:

- *Small group of people. Lifestyle that they lead is a very important criterion for distinguishing them from other consumer segments. They take more care about health and follow trends.* (Serbian producer)
- *Active lifestyle, mothers.* (Slovenian producer)

Regarding the consumers' knowledge and awareness of HC, producers think, with just a few exceptions (Serbia, Bosnia and Slovenia), that consumers do read information provided on the food packaging prior to making purchases. Furthermore, producers in WBC have named other important sources of information for the local consumers: word-of-mouth, newspapers and magazines, as well as the contact with salespeople and other company representatives who are in charge of providing information to customers.

- *They read labels more often than it was the case in the past, but still it is not enough. Consumers usually read labels before making a purchase of some product. They want to know what they are giving their money for.* (Serbian producer)
- *In general, those who take care about their consumption, they read labels before buying.* (Montenegrin producer)
- *They read information on labels and on packaging, watch ads on TV, and read articles in different health and lifestyle magazines.* (Slovenian producer)
- *Those consumers who are interested in the matter call our sales department and ask about a certain product. Some of them get the information by asking a friend or a relative who is consuming a specific product.* (Macedonian producer)

To communicate health benefits of functional foods WBC producers use all available promotional tools and media – packaging (verbal descriptions and pictures), sales promotions, TV advertising, billboards, leaflets and brochures, media announcements, press releases and other PR tactics, but also well-educated personnel in specialized shops who would be ready to provide advice to consumers.

Consumers' characteristics

After records with missing data had been removed, 2884 responses were retained for statistical analysis. In order to assess the factors of influence on the frequency of consumption of products with HC, a multiple linear regression was performed. The complete list of the variables included in the model is presented in Table 2. Four kinds of explanatory factors are considered: socio-demographic (e.g. gender, age, education, etc.), physiological (overall

Table 2: Descriptive statistics

Variable	Mean	Std. Deviation
How often they consume products with HC	5.3	2.4
Gender	1.6	0.5
Age	2.3	1.0
Education	2.7	1.0
Standard of a household	2.2	0.7
Children in a household	0.3	0.4
Overall current state of health	3.7	0.6
BMI	3.6	0.5
Level of information	2.9	0.2
HC on product labels are useful	1.3	0.4

state of health and body mass index), level of information (knowledge) on products with HC and skepticism about products with HC.

The regression model explained 37.1% of the variance of the experimental data. The results of the regression analysis are reported in Table 3. Among socio-demographic explanatory variables affecting frequency of consumption of products with HC, age, education, and economic standard of a household had significant influence. Consumers with higher educational level and higher income would buy products with HC more often, which supports some previously published data [18], [9]. Concerning the age, results indicated that older consumers were less likely to consume products with HC than younger ones.

Physiological factors, overall state of health, and body mass index have not proved to be statistically significant in predicting the frequency of the consumption of HC products. A reason for this can be found in the fact that respondents estimated their generic health status, without concentrating on some particular health issues that they could be concerned of, whereas some preceding studies denoted that the use of functional foods was associated with specific health problems [19] and thus, with specific functional food types as well as the care about calories intake [14].

As expected, respondents who considered being better informed about this kind of food, tended to consume the products with HC more often. Similar findings are revealed regarding the consumers' skepticism about products with HC – consumers who agreed with the statement that HC made on product labels were useful in helping them to decide which product to consume, used items with HC more frequently. These outcomes corroborate conclusions drawn by *Grunert*, *Scholderer* and *Rogeaux* [8] and by *Sun* [14].

Table 3: Regression results for frequency of consumption

Variable	Beta	P
Gender	0.001	> 0.05
Age	0.041*	< 0.05
Education	-0.057**	< 0.01
Standard of a household	-0.106**	< 0.01
Children in a household	0.022	> 0.05
Overall current state of health	0.033	> 0.05
BMI	0.009	> 0.05
Level of information	-0.319**	< 0.01
HC on product labels are useful	0.101**	< 0.01

Asterisks indicate that estimated coefficients are significant at *5% or **1% level of confidence

Conclusions and implications

Comparative analysis of the characteristics of the typical consumer of functional foods and producers' perception of these revealed interesting outcomes. It can be concluded that producers understand a typical consumer of the products with HC in terms of his/her age, education and purchase power. The examination shows that the consumers of functional foods are young, with higher income and higher level of education than average, which is in line with findings of previous studies undertaken on this matter [9], [1], [3], [13].

On the other hand, producers gave greater weights to certain consumers' attributes than it was proved by the factual state of affairs. Most surprisingly, our study failed to demonstrate that gender plays a significant role in defining a typical consumer of functional foods. Although preceding research studies [12], [18] unanimously exhibit that women are more prone to purchase products with HC, there was no established statistically significant relation between frequency of purchase of functional foods and respondents' gender in our study. In addition, both the presence of children in households and respondents' state of health have not appeared to be significant, which differs from the results ascertained in previous studies [10], [15], [19], [21].

Given that both WB producers' opinions and the previous body of research indicate that functional food consumers are primarily females, but considering that that was not underpinned by the survey results, it can be alleged that companies should put more efforts in education and do better communication targeting of women in WBC. This statement especially pertains to mothers, in the sense that they should be explained how the consumption of products with HC may be beneficial

to their families. Notwithstanding the fact that numerous producers stated they used all available media to inform consumers on various aspects of functional foods, it is acknowledged by consumers' responses that informative activities should be broaden and conducted in more effective manner. Provided that typical consumer of functional foods is from the younger cohort and in view of the Internet communication tools characteristics (not expensive, allow production of interactive and detailed content, etc.), online media are considered to be an adequate choice.

Based on the results of our survey, it might be advocated that the relation of one's health status and their consumption of products with HC should not be emphasized in the promotion of functional foods at this moment. However, the insignificance of that relation also indicates that marketers should commit more to explaining and educating consumers on associations of their consumption patterns and their state of health.

Finally, some limitations should be mentioned too. Firstly, self-reported measures as the indicators of consumption frequency and level of information on products with HC were applied, which may lead to fairly inaccurate assessments. Secondly, since face-to-face interviews were conducted, that might imply sensitivity to socially desirable answers. In order to further improve studies in this field, the use of diary method could be more reliable in investigating consumption and level of knowledge on functional foods. Further research should investigate whether the promotion of products with HC could contribute to a shift in the overall diet towards healthier food choices, which should lead to a general improvement of the food chain competitiveness.

References:

1. Anttolainen, M., Luoto, R., Uutela, A., Boice, J. D., Blot, W. J., McLaughlin, J. K., & Puska, P. (2001). Characteristics of users and nonusers of plant stanol ester margarine in Finland: An approach to study functional foods. *Journal of the American Dietetic Association, 101*(11), 1365-1368.
2. Ares, G., & Gambaro, A. (2007). Influence of gender, age and motives underlying food choice on perceived healthiness and willingness to try functional foods. *Appetite, 49*(1), 148-158.
3. Childs, N. M. (1997). Functional foods and the food industry, consumer, economic and product development issues. *Journal of Nutraceuticals, Functional and Medical Foods, 1*, 25-43.
4. Christidis, N., Tsoulfa, G., Varagunam, M., & Babatzimopoulou, M. (2011). A cross sectional study of consumer awareness of functional foods in Thessaloniki, Greece. *Nutrition & Food Science, 41*(3), 165-174.
5. Dmitrović, T., Vida, I., & Reardon, J. (2009). Purchase behavior in favor of domestic products in the West Balkans. *International Business Review*, *18*(5), 523-535.
6. Frewer, L., Scholderer, J., & Lambert, N. (2003). Consumer acceptance of functional foods: Issue for the future. *British Food Journal*, *105*(10), 714-731.
7. GIA. (2010). *Functional foods and drinks: A global strategic business report*. Retrieved from http://www.prweb.com/releases/functional_foods/functional_drinks/prweb4688424.htm
8. Grunert, K. G., Scholderer, J., & Rogeaux, M. (2011). Determinants of consumer understanding of health claims. *Appetite, 56*(2), 269-277.
9. Hilliam, M. (1996). Functional foods: The Western consumer viewpoint. *Nutrition Research, 54*(11), S189-S194.
10. Krystallis, A., Maglaras, G., & Mamalis, S. (2008). Motivations and cognitive structures of consumers in their purchasing of functional foods. *Food Quality and Preference, 19*(6), 525-538.
11. Milošević, J., Žeželj, I., Gorton, M., & Barjolle, D. (2012). Understanding the motives for food choice in Western Balkan Countries. *Appetite, 58*(1), 205-214.
12. Poulsen, J. B. (1999). *Danish consumers' attitudes towards functional foods* (Working Paper 62). Aarhus: Aarhus School of Business, MAPP.
13. Stojanović, Ž., Ognjanov, G., Spiroski, I., & Zaouche-Laniau, M. (2013). Exploring an emerging market through focus groups and expert interviews: Health claim products in the Western Balkans. In D. Barjolle, M. Gorton, J. Milošević Đorđević & Ž. Stojanović (Eds.), *Food Consumer Science: Theories, Methods and Application to the Western Balkans* (pp. 57-72). Springer.
14. Sun, Y. H. C. (2008). Health concern, food choice motives, and attitudes toward healthy eating: The mediating role of food choice motives. *Appetite, 51*(1), 42-49.
15. Urala, N. (2005). *Functional foods in Finland: Consumers' views, attitudes and willingness to use*. Retrieved from http://www.vtt.fi/inf/pdf/publications/2005/P581.pdf
16. Urala, N., & Lahteenmaki, L. (2007). Consumers' changing attitudes towards functional foods. *Food Quality and Preference*, *18*(1), 1-12.
17. van Trijp, H. C. M., & van der Lans, I.A. (2007). Consumer perceptions of nutrition and health claims. *Appetite, 48*(3), 305-324.
18. Verbeke, W. (2005). Consumer acceptance of functional foods: sociodemographic, cognitive and attitudinal determinants. *Food Quality and Preference, 16*(1), 45-57.
19. Verbeke, W., Scholderer, J., & Lahteenmaki, L. (2009). Consumer appeal of nutrition and health claims in three existing product concepts. *Appetite, 52*(3), 684-692.

20. Williams, P. (2005). Consumer understanding and use of health claims for foods. *Nutrition Research, 63*(7), 256-264.

21. Xu, L., & Wu, L. (2008). Food safety and consumer willingness to pay for certified traceable food in China. *Journal of the Science of Food and Agriculture*, *90*(8), 1368-1373.

Žaklina Stojanović

is a Full Professor employed at the Faculty of Economics, University of Belgrade. She teaches Agricultural Economics in the undergraduate studies and gives lectures related to agro-rural courses in the Economic Policy and Development master's program and the Economics PhD program. She has edited six and written as the author three books as well as more than 100 articles in agricultural economics, rural development and agricultural finance.

Jelena Filipović

is an Assistant Professor of Marketing Communications and Services Marketing at the Faculty of Economics, University of Belgrade. Her research interest includes Internet communications, children as consumers, and marketing of food products. She has published articles in the International Marketing Review, Communications and Strategies, The South East European Journal of Economics and Business, Ekonomika poljoprivrede, etc.

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Ivana Domazet
Institute of Economic Sciences, Belgrade

Dragan Filimonović
Institute of Economic Sciences, Belgrade

Olivera Pantić
Institute of Economic Sciences, Belgrade

TRADE AND EU ACCESSION: THE CASE OF SERBIA

Trgovina i pristup EU: primer Srbije

Abstract

This paper analyzes the export competitiveness of Serbia vis-à-vis European Union and the possible trade effects of Serbian EU accession scenario. We have observed several macroeconomic variables for determining the external position of Serbia. The trade effects of Serbia's EU accession scenario are evaluated using the partial equilibrium Global Simulation Model (GSIM). The evaluated scenario assumes complete trade liberalization between Serbia and EU, hence, the Serbia's adoption of EU tariffs towards the third parties. We find that Serbia is significantly lagging behind in terms of quality of export products and structural development. Regarding the agricultural products, the simulation predicts the increase in Serbian exports to the EU of 28% compared to pre-accession level. The predicted Serbian imports of agricultural products from the EU increased for 25%. The analysis suggests that Serbian non-agricultural exports to the EU will rise by 12.8% compared to initial trade flows, while the Serbian non-agricultural imports from the EU will rise by 13.4%. The trade simulation implies that Serbia will export more of both agricultural and non-agricultural products to the EU, but less to Russia and rest of the world. Moreover, the model implies that Serbia would be better off with joining the EU in terms of welfare indicators.

Key words: *export competitiveness*, *EU accession*, *trade liberalization*, *trade effects*, *agricultural products*, *non-agricultural products*

Sažetak

Rad analizira izvoznu konkurentnost Srbije u poređenju sa Evropskom unijom i potencijalne trgovinske efekte scenarija integracije Srbije u EU. Posmatrali smo odabrane makroekonomske pokazatelje u cilju određivanja eksterne konkurentnosti Srbije. Trgovinski efekti posmatranog scenarija su ocenjeni korišćenjem modela parcijalne ravnoteže pod nazivom *Global Simulation Model* (*GSIM*). Posmatrani scenario podrazumeva potpunu trgovinsku liberalizaciju između EU i Srbije, i shodno tome, primenu EU carinskih tarifa od strane Srbije prema trgovinskim partnerima. Zaključili smo da Srbija značajno zaostaje u pogledu kvaliteta izvoznih proizvoda i strukturnog razvoja. Simulacija predviđa povećanje izvoza poljoprivrednih proizvoda Srbije u EU za 28% u odnosu na period pre članstva. Predviđeni nivo uvoza poljoprivrednih proizvoda Srbije iz EU veći je za 25%. Analiza otkriva da bi srpski izvoz nepoljoprivrednih proizvoda u EU mogao biti veći za 12,8% u poređenju sa nivoom pre liberalizacije, dok bi uvoz istih proizvoda iz EU porastao za 13,4%. Trgovinska simulacija implicira da bi Srbija izvozila više u pogledu obe vrste proizvoda u EU, dok bi se izvoz u Rusiju i ostatak sveta smanjio. Takođe, model implicira da bi Srbija profitirala od članstva u pogledu indikatora blagostanja.

Ključne reči: *izvozna konkurentnost*, *pristupanje EU*, *trgovinska liberalizacija*, *trgovinski efekti*, *poljoprivredni proizvodi*, *nepoljoprivredni proizvodi*

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Introduction

On the 1st of March, 2012 Serbia has received a status of official candidate country for EU membership. At this point, it is certain that Serbia will become an EU member, probably, by the end of this decade. This means that Serbia would have to compete with some of the most developed economies in the world without a possibility to protect its industries and products. Thus, a new challenge is rising upon Serbian economy and its policy makers – how to compete and ensure economic growth in such a competitive environment. Whether the full EU membership will benefit or harm the Serbian welfare is becoming more and more important question.

Stiglitz [18] argues that what is essential driving force of the economic growth is country's ability to expand its export rather than implementation of the free trade policies. Therefore, this paper explores the external competitiveness of Serbia compared to EU countries and analyzes the possible trade and welfare effects for the simulated case of Serbian EU accession. In accord with recent ECB (European Central Bank) studies, this paper assumes the following definition of competitiveness: "the extent to which a country is able to compete in global markets". As Serbia gradually moves towards the EU membership, it is natural to compare its competitiveness with the EU 27 averages. For this purpose, we will use the study by *Orszaghova*, *Savelin*, and *Schudel* [12] as a guideline for choosing the competitiveness indicators. The trade effects of Serbia's EU accession scenario are evaluated using the global simulation model (GSIM) developed by *Francois* and *Hall* [3].

There is no clear attempt in the literature to address the issues of Serbian external competitiveness and the trade effects of economic integration directly. *Markovic* [8, p. 271] identified the primary products as the main part of Serbian exports applying only one aspect of the export competitiveness analysis – export product complexity, without the direct comparison to EU export structure. He concluded that the exports of technologically more complex products mostly depend on non-price attributes and the skill of domestic exporters. *Jakopin* and *Bajec* [6, p. 507] wrote about overall industrial development issues in Serbia. They partially addressed the issue of the industrial competitiveness, and concluded that Serbia has unfavorable export structure (dominated by low-technology sectors) and that it should concentrate on producing the goods for which the demand in the EU is high, i.e. on the high-technology products. *Nikolić* and *Zubović* [10, p. 67] observed the evolution of Serbian industry during the transition period. They argued that the high-tech industry, as the main growth driver, has not developed at a pace needed for a faster catching-up process with the EU average.

Our analysis does not suggest with certainty that Serbia is becoming more competitive in terms of price-cost indicators than EU 27, in fact, it is significantly lagging behind in terms of quality of export products and structural development. The agricultural sector was identified as the main export potential of Serbia with the several products having a high revealed comparative advantage. Moreover, keeping in mind the simplicity and limitations of using the GSIM model, the results suggest that Serbia will benefit by joining the EU in the short run, having the positive net welfare gains in the case of both, agricultural and non-agricultural sectors.

The paper is organized as follows. Section 1 presents the export competitiveness of Serbia compared to the EU in terms of several macroeconomic indicators. Section 2 explores the possible trade effects by simulating the Serbian EU accession scenario. Finally, Section 3 summarizes the findings and discusses the relevance of the results.

Export competitiveness

We have chosen to analyze several external competitiveness indicators for Serbia and the EU, following the recent study of *Orszaghova*, *Savelin* and *Schudel* [12]. They argue that there is no widely accepted method in the literature on how to measure competitiveness and therefore, their analysis is based on several macroeconomic variables. In this paper, we have observed price-cost related and trade indicators, structure of export products and institutional competitiveness.

Price and cost competitiveness

In this subsection, we compare unit labor costs (ULC) and real effective exchange rates (REER), as the price-cost related indicators, to labor productivities and shares in the world exports, for Serbia and EU 27. The data covers the period from 2001 to 2011 (see Figure 1 and 2).

ULC measures the average cost of labor per unit of output. It can be calculated as the quotient of average labor cost and labor productivity. As such, it represents an important connection between productivity and cost of labor in output production (OECD statistics). The real effective exchange rate characterizes the change in value of country's currency compared to the currency basket of its trading partners. It is an often used indicator for evaluating the trend in price and cost competitiveness [1]. Labor productivity, in general, is the ratio of measure of output (gross domestic product or gross value added) and input use (total working hours or total number of employees). According to *Freeman* [4], it is recommended to use GVA (Gross Value Added) as a measure of output as taxes are excluded.

Since the beginning of the crisis in 2008, Serbia witnessed a real depreciation of its currency, while the average REER of the EU was approximately at the same level through the whole period. It is interesting that both experienced the largest real depreciation in 2012[2]. Last year, the fall of REER was 7% in Serbia and 5% in the EU. Hence, we could say that Serbia has improved the price-cost competitiveness in terms of REER compared to EU average.

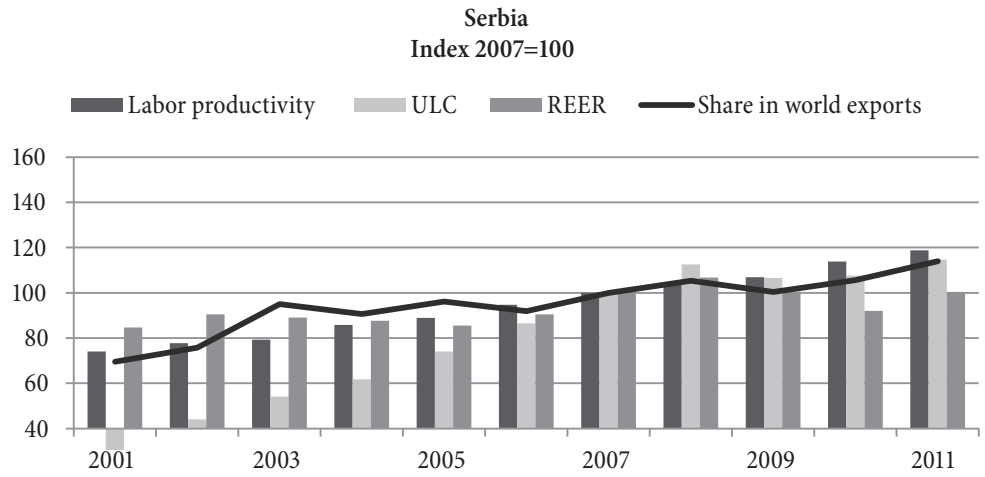
Now, observing the cost factor, both the EU and Serbia faced an increase in ULC after the crisis. In 2011, the costs of labor per unit of output increased by 14% in Serbia and 12% in the EU. Before 2005, the levels of ULC were very low in Serbia because of the low wages at the time, as the country just started the transition process and economic recovery. It is interesting to notice that Serbian gross wages increased by more than 50% since 2005, but this increase corresponds to only 12% in terms of euro [12]. Thus, we could not argue with certainty that Serbia is losing the competitiveness in terms of ULC (especially in absolute values).

Although it seems that the rise of ULC in Serbia may be bearable as the productivity levels exceed the costs, the story behind it is somewhat different. Since 2008, the levels of productivity in Serbia are constantly increasing due to larger drop in the employment rate compared to GDP growth[3], which in the long run is an unsustainable development. Nevertheless, the Serbian share in the world's exports is rising, which may not necessarily indicate the improvement in the competitiveness but rather it is a consequence of "opening" the economy after the isolation period during the 1990s.

2 Data for 2012 is not shown because other indicators are not available for the case of Serbia

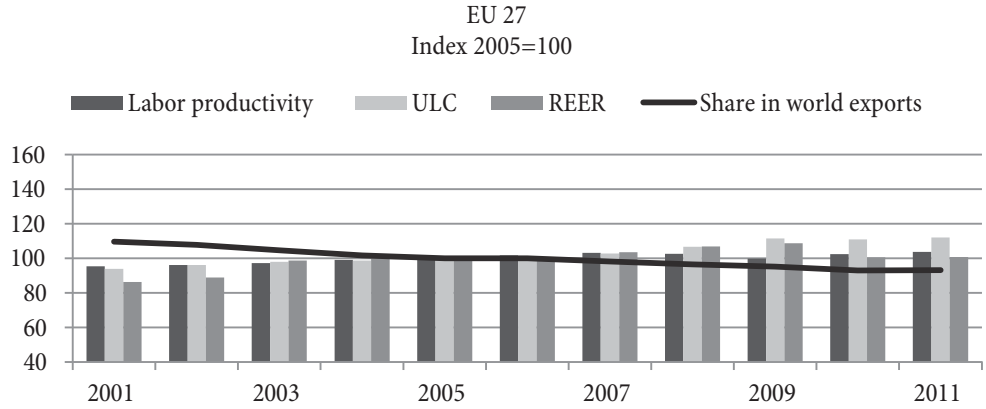
3 It is noticed while computing the labor productivity indicator for Serbia

Figure 1: Price-cost indicators and share in world exports, Serbia



Source: [14], [15], [16], [17], [1], [9] and authors' calculations
Note: 2007 is used as the base year because the Serbian REER data index is only available for 2007=100

Figure 2: Price-cost indicators and share in world exports, EU



Source: [2] [20]

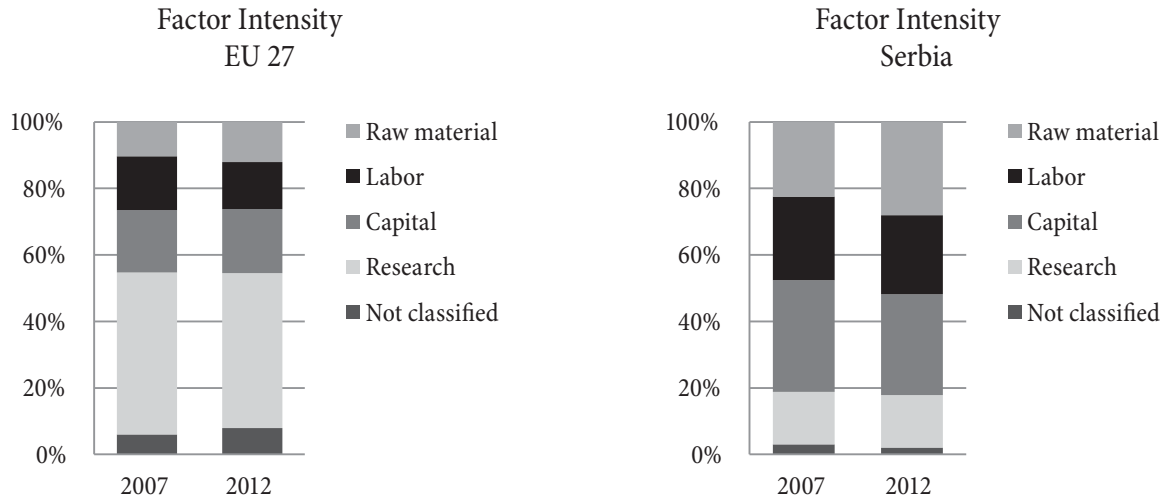
Export complexity

Orszaghova, *Savelin* and *Schudel* [12] suggest that a country can increase the value of its exports by improving the structure of export products, by "climbing up the value chain". Many authors developed different taxonomy in order to address this issue. We will use the factor intensity and technological intensity classifications for export structure analysis.

Yilmaz [22] categorized the goods according to four factors which are intensively used in their production: raw material, labor, capital and research intensive group. His proposal is based on the classical trade theory, which suggests that countries specialize in production given their relative factor endowments. Next, *Lall*'s classification [7] of export product depends on the level of technology used in the production process. Five groups have been identified by *Lall* as follows: primary products, resource-based products, low, medium and high-technology products. *Lall* argues that comparative advantage in producing resource-based products depends on available natural resources. In addition, he suggests that low-technology sector is based on price competition and grows at a slower pace. Therefore, according to him, countries should turn to high-technology manufacturing (especially when they have exploited low-wage advantage) as it provides a better growth possibilities.

Factor intensity structures of Serbian and EU 27 exports differ significantly (see Figure 3). In 2012, raw material and labor products account for more than 50% share in Serbian export and only 26% share in the total EU export. What may be disturbing for Serbia is that the negative trend can be noticed since 2007. The share of these

Figure 3: Factor intensity of export products



Source: [14], [15], [16], [17], [19] and authors' calculations
Notes: The first graph area (from bottom to up) represents not-classified products. Export data is classified by SITC rev. 4 divisions

groups in Serbian export structure increased by 5%, while the portion of the capital and research intensive products declined by 4% over the last five years. At the same time, EU export structure remained unchanged, mostly dominated by research and capital intensive products.

Technological configuration (see Figure 4) of Serbian exports has experienced some improvements towards the high and medium technology industries since 2007. Serbia has expanded the share of technologically advanced products mainly due to the increase in car exports in 2012. However, the share of advanced exports is still substantially below the EU 27 level.

Despite the progress Serbia has made towards the industries that require more advanced technologies and high-skilled labor, its exports are still mainly driven by labor intensive and low-technology manufacturers. According to *Orszaghova*, *Savelin* and *Schudel* [12], this could make such countries exposed to Asian competitors and other emerging low-income regions, especially when it comes to the future expansion of exports to EU market.

Trade indicators

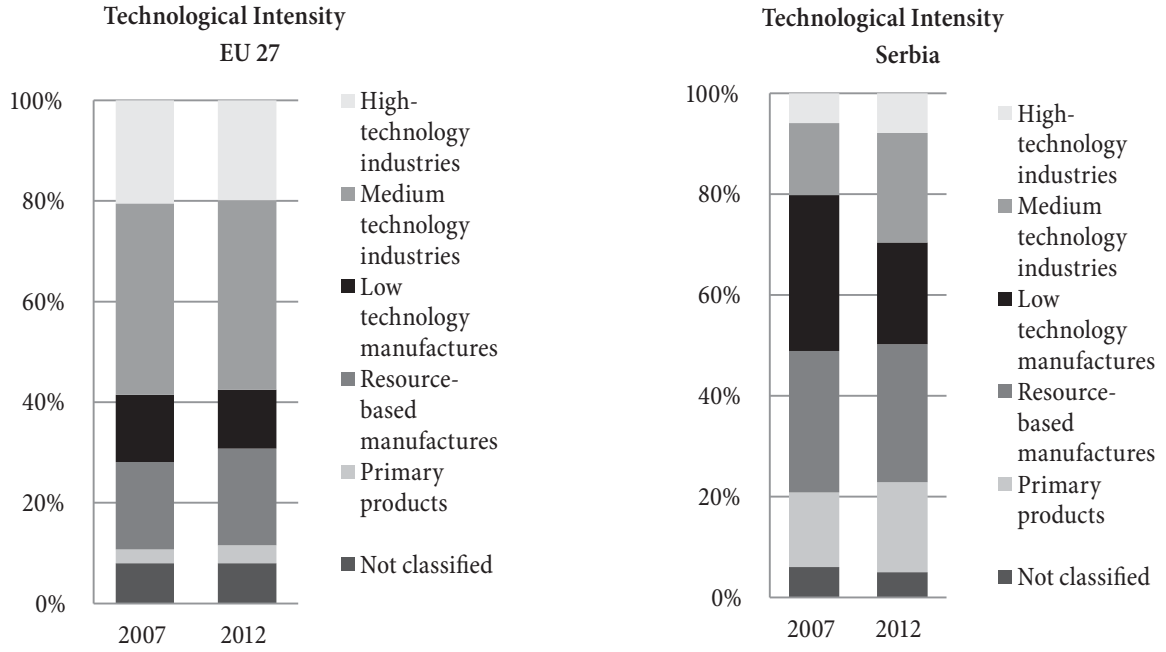
In this subsection we will explore the structural trade indicators, with the emphasis on determining the industry specialization and market concentration. The country's economic specialization is assumed to have a significant contribution to growth and export performance. Additionally, nations with the high export exposure to a single or few markets tend to have more unstable growth patterns. For this analysis, Revealed Comparative Advantage (RCA) and Herfindahl-Hirschman (HH) Indexes were applied.

The RCA index is defined as a share of single product in the total country's export in relation to its share in world trade:

$$RCA_{ij} = \frac{\left(x_{ij} / X_{it}\right)}{\left(x_{wj} / X_{wt}\right)}$$

where x_{ij} and x_{wj} represent the value of exports of country i of product j and world exports of product j, while X_{it} and X_{wt} are country's total exports and world total exports. When the value of RCA index is above one, it is said that a country has a revealed comparative advantage in that product. RCA index is often used in order to evaluate country's export potential. *Saboniene* [13] points out several conclusions that could be drawn from the index results. First, it can provide insights about possibility to trade with the new partners. Countries with similar RCA values are not likely to have large bilateral trade

Figure 4: Technological intensity classification of export products



Source: [14], [15], [16], [17], [19] and authors' calculations
Notes: The first graph area (from bottom to up) represents not-classified products. Export data is classified by SITC rev. 4 groups

patterns, unless the significant amount of intra-industry is present. Second, if the index is computed at high product disaggregation levels, it may draw attention to new, non-traditional, export potentials.

The Herfindahl-Hirschman (HH) Index is a statistical measure of concentration. The HH index is used for defining concentration in different contexts. As an export partner concentration measure, it is computed by summing up the squared export shares of all export partners:

$$HH = \sum_{i=1}^{n} \left(\frac{X_i}{X} \right)^2$$

Where N is the number of trading partners for exports and X_i is the value of country's exports to partner i and X is the total value of exports. The level of partner concentration is lower when the value of index is lower, and vice versa. In the case of only one export partner it would be equal to 1.

Observing the top five export products, Serbian export structure is mainly composed of industries with low level of technological sophistication, while the EU exports are dominated by more advanced manufacturers. Both, the EU and Serbia have comparative advantage in their top five exporting products, as RCA index exceeds unity (see Table 1). The Serbian export share of corn (fruits) is relatively 23 (98) times bigger compared to the share of the same products in the total world exports. Therefore, it seems clear that Serbia has comparative advantage in producing agricultural products. In addition, Serbia has a good export expanding potential in hosiery industry, with RCA index of 28 and the current share in export of 2%.

Table 2: Top 5 exporting destinations

EU 27	Export share	HHI
USA	17%	
China	9%	
Switzerland	8%	0.06
Russian Federation	7%	
Turkey	4%	
SERBIA		
Germany	12%	
Italy	11%	
Bosnia Herzegovina	10%	0.06
Romania	8%	
Russian Federation	8%	

Source: [14], [15], [16], [17], [20] and authors' calculations

In 2012, EU and Serbian exports were diversified across partners (see Table 2). In the case of the EU, 24 main countries accounted for 80 % of exports, while 15 partners made 80% of total Serbian exports [15], [17]. Although the value of HH market concentration index for Serbia is low (0.06), it may not represent a credible image of export diversification. If EU market is observed as a single one, it represents more than 60% of total Serbian export, thus making Serbia vulnerable to demand distortions in the EU. Nevertheless, this fact may be in favor of the EU integration of Serbia.

Structural competitiveness

When it comes to country's international competitiveness, governments can play an important role in improving export results by influencing institutional bases of the economy [12]. Country's infrastructure, education system, legislation environment, level of corruption, administrative procedures etc., represent the important determinants

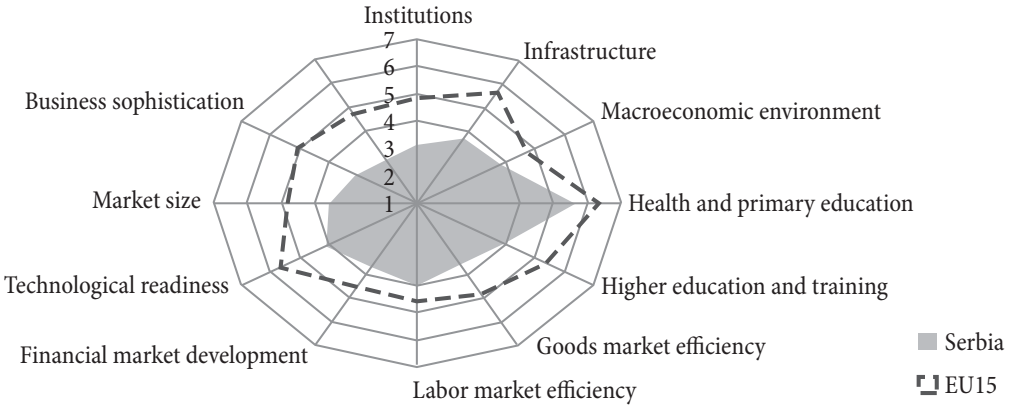
Table 1: Top 5 export products

EU 27	Export share	RCA	Technology
Motor cars and other motor vehicles	6%	1.6	Medium technology
Petroleum oils, other than crude	6%	1.1	Resource based
Medicaments	4%	2.4	High technology
Other aircraft; spacecraft	2%	3.5	High technology
Parts and accessories of the motor vehicles	2%	1.1	Medium technology
SERBIA			
Maize (corn)	5%	22.9	Primary based
Insulated wire, cable	4%	6.2	Low technology
New pneumatic tires, of rubber	3%	5.1	Resource based
Fruit and nuts	2%	97.8	Primary based
Medicaments	2%	1.1	High technology

Source: [19] [20]

Note: Products are classified by 4-digit heading of Harmonized System 2007. Technology taxonomy is based on *Lall* [7].

Figure 5: Institutional and structural indicators of competitiveness



Source: [21]

of ease of doing business. This issue may be particularly relevant for Serbia, as it strives to attract foreign direct investments.

Every year, World Economic Forum publishes competitive indexes for great number of countries. The index is based on three pillars: basic requirements (institutions, infrastructure, macroeconomic environment and health and primary education), efficiency enhancers (higher education and training, goods market efficiency, labor market efficiency, financial market development, technological readiness and market size) and innovation factors (business sophistication and innovation) [21]. For each individual category there are marks from 1 to 7, where 1 indicates the lowest level and 7 the highest level of development. Hence, this index will be used for the assessment of structural development in Serbia compared to the EU.

According to the data (see Figure 5), Serbia is seriously lagging behind the EU 15 regarding all segments of structural development. The most significant discrepancies are in infrastructure, business sophistication and innovation. Concerning the health and primary education, as well as labor market efficiency, Serbia is close to EU 15 benchmarks. Corruption, legislation quality and governance effectiveness are often considered to be major barriers to conducting business in all candidate countries.

Materials and methods

The analysis covers changes in the trade patterns and welfare effects of two product groups (agricultural and non-agricultural products[4]) between Serbia, EU, Russia (as Serbian major trading partner) and the rest of the world (ROW). We find it useful to observe agricultural products separately, as Serbia may poses comparative advantage in their production.

The GSIM model

The partial-equilibrium GSIM model developed by *Francois* and *Hall* [3] is suitable for studying trade policy changes on the global, regional or unilateral level using the tariff and trade flow data. According to *Holzner* [5], this type of partial equilibrium model provides some useful advantages as it enables the analysis of short-run effects of trade policy changes with a minimum data and computational requirement.

One of the basic assumptions of the model is the national product differentiation, meaning that imported goods are imperfect substitutes for each other. The model envisages the constant and equal elasticity of substitution across the products with different origins. Moreover, the aggregate elasticity of demand and the supply elasticity are held constant as well. The solution set covers world (export) prices that clear the global market. When a global set of equilibrium prices is maintained, it can be used for determining the national results. *Francois* and *Hall* used log-linearized (percent-change) import demand and generic export supply equations. The core equation, which represents the global market clearing condition for each export good, is given by:

4 MTN standard product groups

$$\hat{M}_{i,r} = \hat{X}_{i,r} \Rightarrow$$
$$E_{x(t,r)}\hat{P}_{i,r}^{*} = \sum_{v} N_{(i,v),(r,r)}\hat{P}_{(i,v),r} + \sum_{v}\sum_{s\neq r} N_{(i,v),(r,s)}\hat{P}_{(i,v),s} = \sum_{v} N_{(i,v),(r,r)}\left[P_{r}^{*} + \hat{T}_{(i,v),r}\right] + \sum_{v}\sum_{s\neq r} N_{(i,v),(r,s)}\left[P_{r}^{*} + \hat{T}_{(i,v),s}\right] \quad (1)$$

where ^ denotes a proportional change, *r* and *s* denote exporting region and *v* denotes importing region, while *i* represents a product variety. *M* and *X* are import and export quantities, respectively. The elasticity of export supply is denoted as $E_{x(i,r)}$ and world prices for exports from region *r* is denoted by $P_{i,r}^{*}$. $N_{(i,v),(r,r)}$ is the own price demand elasticity, $P_{(i,v),r}$ is the internal price for products from region *r* imported into region *v*. $N_{(i,v),(r,s)}$ denotes the cross-price elasticity. Lastly, term $T_{(i,v),r}$ characterizes the tariff impact, where $T=(1+t)$. Using (1) we can define S ≤ R global market clearing conditions for any set of R trading countries. If the domestic production is included in the model there will be S = R.[5]

Data

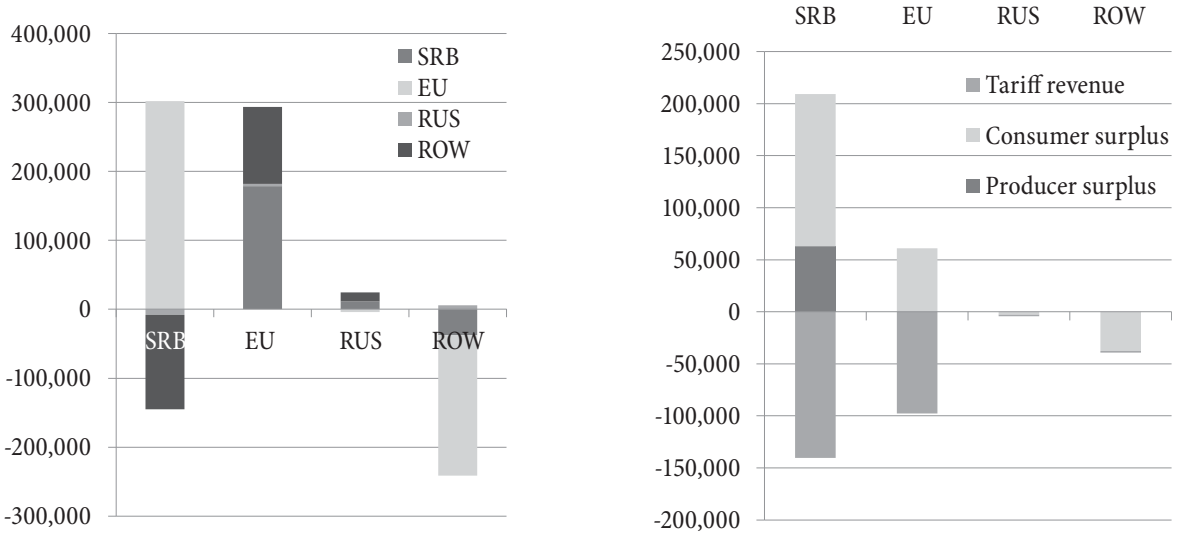
In order to run the GSIM model, the following input data is required: initial bilateral trade flow, initial import tariffs, final import tariffs, export supply and import demand elasticities and elasticities of substitution. As the case with four entities and two product groups is observed, we had to fill in the two 4x4 data matrices.

Trade flow and initial import tariff data (average applied MFN tariffs) for 2012 are taken from UN Comtrade (Commodity Trade Statistics) and TRAINS (Trade Analysis and Information System) database, using the WITS (World Integrated Trade Solution) [19] software. Because of the unavailability of certain import tariff data, selected benchmark values are used instead. Serbian import tariffs for goods from Russia and the EU are replaced with Macedonian ones, following the work of *Holzner* [5]. For the Russian import tariffs on EU goods Russian tariff rates on imports from Germany are used. Finally, the import tariffs of the rest of the world for the Serbian, EU and Russian products are determined as an average of available applied import tariffs in "other" countries in 2010 (the first available year). The final import tariffs are defined according to the evaluated scenario, which assumes complete trade liberalization between Serbia and the EU, hence, the Serbia's adoption of EU tariffs towards the third parties.

The values for export supply (1.5), import demand (-1.25) and elasticity of substitution (5) are taken from *Francois* and *Hall* [3]. In addition, the assumption of flat export supply curve for large regions is adopted from *Holzner* [5], meaning that export supply elasticity for the EU, ROW and Russia takes the value of 9999999.

5 For more details on model specification please refer to *Francois* and *Hall* [3]

Figure 6: Trade changes and welfare effects, agricultural products



Source: Authors' calculations
Note: Values are in thousands of U.S. dollars

Results and discussion

After running the GSIM model for the Serbia's EU accession scenario, the estimates for trade patterns and welfare effects for agricultural and non-agricultural products are obtained. As it could have been expected, the model predicts the most significant changes in trade flow between Serbia and the EU, as in this case the tariff change was the most significant after the accession scenario.

Regarding the agricultural products (see Figure 6), the simulation predicts the increase in Serbian exports to the EU of 28% compared to pre-accession level. According to the model, the Serbian agricultural exports towards the Russia and ROW decline. The size of export decrease to Russian market is 5% and to the ROW is 9%. In addition, the predicted EU exports of agricultural products to Serbia increased by 25%. Due to liberalization of trade Serbia will encounter significant reduction in agricultural tariff revenues, but, it is smaller than the combined increase in consumer's and producer's surplus. It can be also noticed that EU consumers will benefit with the Serbian accession, as the Serbian agricultural products will become relatively cheaper, but the loss in the tariff revenues exceeds the consumer surplus in the EU.

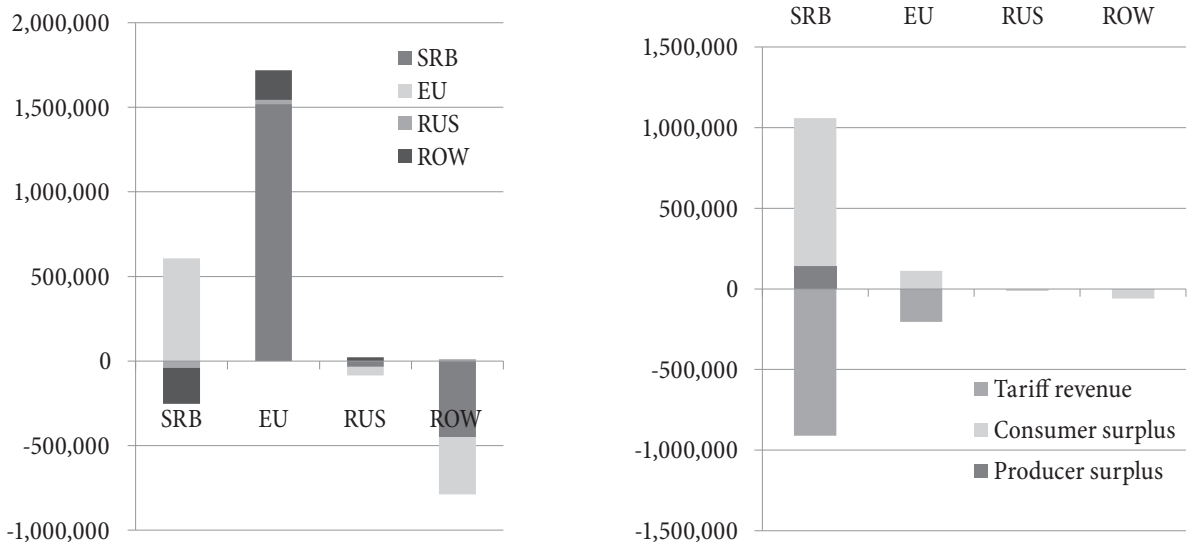
Concerning the non-agricultural products (see Figure 7), the Serbian exports to the EU are by 12.8% higher compared to initial trade flows. Furthermore, there is roughly the same decline in Serbian exports to Russia and ROW of 7%. The EU non-agricultural goods exports to Serbia increased by 13.4%. It is interesting that the cut in the Serbian tariff revenue is significant and fairly close to gains in the terms of consumer and producer surpluses.

However, using this type of partial equilibrium models comes with certain disadvantages. It does not reveal the long-run effects and adjustment paths of a policy change. Hence, some additional features such as capital flows, labor market effects or income distribution cannot be observed neither [5]. Nevertheless, being aware of limitations, the obtained results may suggest that Serbian membership in the EU will potentially have a significant effect on trade patterns in Serbia and the EU in the short run. Removal of the tariffs between Serbia and the EU would lead to a higher Serbian exports to EU (especially in the case of agricultural products) and vice versa, with positive net welfare gains in Serbia, in terms of consumer's and producer's surplus.

Conclusion

The objective of this paper is twofold. First, following the argument of *Stigliz* [18] that whether the county will benefit from the free trade arrangements or not, mainly depends on its export capabilities, we have tried to determine the export competitiveness of Serbia compared to the EU by

Figure 7: Trade changes and welfare effects, non-agricultural products



Source: Authors' calculations
Note: Values are in thousands of U.S. dollars

observing several different indicators. Second, we have explored the possible trade and welfare effects for the Serbian EU accession scenario.

The export competitiveness analysis vis-à-vis the EU has not revealed a clear picture on the Serbian price-cost competitiveness. On the one hand, Serbia is becoming more price-competitive as the Dinar has depreciated more than the Euro. On the other, it is gradually losing the cost-competitiveness due to greater increase in labor costs compared to EU. Moreover, the significant improvement of Serbian labor productivity is only a deception. The increase is caused by the substantial reduction in overall employment and not by the increase in output. Therefore, in the years to come, Serbia should concentrate on fostering policies which will promote growth and increase the employment. Next, the Serbian exports are mainly composed out of resource-based and labor-intensive products. Current export structure may impose the obstacle to increase the exports to the EU in the long run, as the demand for this product groups is decreasing in the EU.

In addition, Serbia will face tough Asian competition in labor-intensive segment if the current export structure is going to be maintained. Furthermore, Serbia has significant revealed comparative advantage in two agricultural sectors, maize and fruits and nuts production. This indicates that Serbia is highly competitive in these sectors and possibly it can enhance the exports of these products in the future. Also, it is important to notice that Serbian exports are highly concentrated when observing all EU countries as a single market. Thus, it may be economically reasonable to strive towards the EU membership. Finally, one of the greatest challenges in improving Serbian competitiveness will be the improvement of institutional and structural development. Therefore, in order to attract more FDI which would presumably bring more advanced technologies, Serbia would have to improve the quality of institutional governance and foster the rule of law in years to come.

The conducted GSIM simulation of the Serbian accession scenario implies that Serbia will export more of both, agricultural and non-agricultural products. As one could expect, the model predicts a higher increase in export of agricultural products. This is in line with the argument that Serbia is overall a low-technology and labor-intensity driven economy. Nevertheless, the welfare indicators in terms of tariff revenues, consumer and producer surplus show that Serbia would still be better off in both cases by joining the EU. However, these results should be considered with caution, given the lack of proper data and limitations of the model.

References

1. Darvas, Z. (2012). *Real effective exchange rates for 178 Countries: A new database* (Bruegel Working Paper 2012/06). Retrieved from http://www.bruegel.org/publications/publication-detail/publication/716-real-effective-exchange-rates-for-178-countries-a-new-database/
2. ECB Statistical Data Warehouse. (2013). Unit Labour Costs, EU 27, Index (2005=100).
3. Francois, J., & Hall, H. K. (2003). *Global simulation analysis of industry-level trade policy*. Retrieved from http://vi.unctad.org/tda/presentations/13September/Vanzetti/GSIMpaper.pdf
4. Freeman, R. (2008). *Labour productivity indicators: Comparison of two OECD databases productivity differentials & the Balassa-Samuelson effect*. Paris: OECD Statistics Directorate. Retrieved from http://www.oecd.org/employment/labour-stats/41354425.pdf
5. Holzner, M. (2013). Impact of Croatian EU accession on regional trade patterns. *wiiw Policy Notes and Reports*, *10*, 1-15. Retrieved from http://wiiw.ac.at/impact-of-croatian-eu-accession-on-regional-trade-patterns-p-2982.htm
6. Jakopin, E., & Bajec, J. (2009). Challenges of industrial development of Serbia. *Panoeconomicus*, *56*(4), 507-525.
7. Lall, S. (2000). *The technological structure and performance of developing country manufactured exports, 1985-98* (QEH Working Paper Series 44). Retrieved from http://economics.ouls.ox.ac.uk/12784/1/qehwps44.pdf
8. Markovic, I. (2010). Improvement of Serbian export competitiveness. *Facta Universitatis*, *7*(3), 271-278.
9. National Bank of Serbia. (2013). Average gross wages, total, 1997-2012.
10. Nikolić, I., & Zubović, J. (2013). Structural changes in Serbian industry during transition. *Industrija*, *41*(2), 67-79.
11. OECD Statistics. (2013). Unit Labour Costs. Sources and definitions. Paris: OECD.
12. Orszaghova, L., Savelin, L., & Schudel, W. (2013). *External competitiveness of EU candidate countries* (Occasional Paper Series No. 141). Frankfurt am Main: European Central Bank. Retrieved from http://www.ecb.europa.eu/pub/pdf/scpops/ecbocp141.pdf
13. Saboniene, A. (2009). Lithuanian export competitiveness : Comparison with other Baltic States. *Inzinerine Ekonomika – Engineering Economics*, *2*, 49-57.
14. Statistical Office of the Republic of Serbia. (2013a). Gross Value Added by activities at constant prices, 2000-2011.
15. Statistical Office of the Republic of Serbia. (2013b). Exports, by SITC Rev. 4 Divisions, USD thousand, 2007 and 2012.
16. Statistical Office of the Republic of Serbia. (2013c). Number of employed – total, annual average, 2001-2012.

17. Statistical Office of the Republic of Serbia. (2013d). Exports, by SITC Rev. 4 groups, 2007 and 2012.
18. Stigliz, J. E. (2006). Making trade fair. In Stigliz, J. E. *Making globalization work* (pp. 61-102). London: Penguin Books Ltd.
19. WITS. (2013). Exports, European Union, SITC Revision 4 Divisions, 2007 and 2012.
20. World Data Bank. (2013). Exports of goods and services (constant 2005 US$), 2001-2012.
21. World Economic Forum. (2013). The global competitiveness report 2012-2013. Retrieved from http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2012-13.pdf
22. Yilmaz, B. (2003). *Turkey's competitiveness in the European Union: A Comparison with five candidate countries – Bulgaria, the Czech Republic, Hungary, Poland, Romania – and the EU 15* (Eastward Enlargement of the Euro-Zone Working Papers 12). Retrieved from http://www.ezoneplus.org/archiv/ezoneplus_wp_twelve.pdf

Ivana Domazet

is a Research Fellow at the Institute of Economic Sciences, Belgrade and Associate Professor at the Belgrade Banking Academy – Faculty for Banking, Insurance and Finance, Union University. She teaches courses on Marketing (graduate studies), Marketing Management, Marketing Strategy and Integrated Communications (postgraduate studies). Her scientific interest refers to marketing research and strategy, integrated marketing, communications, CRM and strategic management. She published a book in the field of integrated marketing communications as well as numerous papers related to foregoing topics. She is member of the Serbian Scientific Association of Economists and the Serbian Marketing Association and Vice President of the Scientific Council at the Institute of Economic Sciences.

Dragan Filimonović

is a Junior Researcher at the Institute of Economic Sciences, Belgrade. He completed the undergraduate studies in 2011 at the Faculty for Banking, Insurance and Finance – Belgrade Banking Academy, Union University. In September 2012, he enrolled at master program in International and Monetary Economics at the University of Basel. His research interests include international trade and empirical macroeconomics.

Olivera Pantić

is a Research Associate at the Institute of Economic Sciences in Belgrade. She completed the undergraduate studies in 2010 at the Faculty of Economics – University of Belgrade. In 2010 she enrolled in master studies at the Department of Economic Policy and Development at the Faculty of Economics – University of Belgrade. In November 2012 she successfully defended master's thesis entitled "Small and medium enterprises as a development factor of agro-food system of Serbia." In 2012/2013 she started PhD studies at the Faculty of Economics in Belgrade. Her research interests include agrarian economy, rural development, small, and medium-sized enterprises and entrepreneurship.

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