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2. Novićević, B., Antić, Lj. (2009), Upravljačko računovodstvo, Niš, Ekonomski fakultet.

3. Malinić S. The modern acconting system – the answer to the challenges of the environment, entreprise and management, 40 godina računovodstva i korporativnih finansija: 1-11, Zlatibor, AAAS, Beograd.

4. National Bank of Serba, www.nbs.rs (15.02.2012).

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# THE EFFECTS OF EU ENLARGEMENT IN EMPIRICAL MODELS

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**Abstract**. *The literature devoted to the EU often points out its hybrid side, which is in the process of constant transformation. The process is comprehensive, in the economic, political, military and safety domain. This complex task is not timed, because it is considered a process and not a one-time act. The original idea that social changes have evolutive development and need time to become quality changes is not abandoned. Although today's EU environment is drastically changed compared to the late fifties of the last century, the main reasons for a country to join the EU have remained virtually the same. All of these reasons basically refer to the same aspirations of potential candidate countries for membership: economic, political, safety, cultural and others. Possession of an appropriate macroeconomic model and relatively useful statistical data is a conditio sine qua non of a successful analysis of the benefit and the cost of joining the EU.*

**Key Words**: *accession process, EU, accession effects, Cecchini report, empirical models of accession.*

## INTRODUCTION

The last wave of enlargement, when in 2004, 2007, and 2013, 13 new countries, mostly underdeveloped compared to the old member states, were received in the EU brought about institutional, political, and economic consequences which the enlarged EU had to face. The accession of these countries to the EU took place between the two extremes. One extreme of the accession itself brings gains and long-term progress. At the other extreme of the country joining the EU, there can be only harm, and not benefit. Both approaches are based on an estimate, which is not based on facts, analysis or historical experiences of economic integration. Today, there is a well-developed analytical apparatus that can determine with enough precision the benefits and costs that a country which wants to have access to certain economic integration can expect. However, there are opinions that the models are often a mere „smoke screen" that allows

you to prove what you want. Thereby, the used analytic economic policy and overall policy warns that measures should be taken to increase the positive and reduce the negative effects of accession integration. It is very difficult to quantify the overall effects of accession, but most studies argue that, in the long term, the new member states have huge benefits. With the expansion of 2004 and 2007, the forecasts emphasized the profit of 10 billion Euros, 300,000 new jobs and increased gross domestic product by 0.2 %. The effects of costs are one-time and part such that they will act at all times after the entry of new members into the Union. The emergence of some of the costs is considered economically favorable (for example, reduction of subsidies or closure of non-competitive firms), but in the socio-political sense these are undoubtedly short-term cost. Some authors believe that the bodies of the Union and the governments of potential new members continue to hide the cost and only glorify benefits. In this way, the actual impression that a new member will only have after entering is that of benefit, which of course is impossible. The practice of highlighting the benefits and suppressing the costs is very reminiscent of the „propaganda for happiness", which are used by the governments of communist countries.

Due to the fact that the Union has stimulated scientific papers in favor of extension and discouraged critical works, does not mean much to the conclusion that most of the literature considers extension to the EU and new member states good. Regardless of these views, it is obvious that the new members have to pay a price for entry into the Union. This price, however, is not the same for all; moreover, it can be drastically different from country to country. As far as trade is concerned, spectacular changes were not expected other than those that occurred after the removal of tariffs and other barriers in the nineties of the XX century. The main effects of enlargement on agriculture could be summed up in the expected significant growth in productivity of the agro-industrial complex in the candidate countries, whereby a large number of workers tended to drop in agricultural production. On the other hand, the effects on agriculture in the member states were very small due to the small share of this sector in the structure of GDP and employment.

## 1. THE MOTIVES OF A COUNTRY TO JOIN THE EU

One of the main reasons for joining the European integration is, of course, economic. Economic cooperation presupposes the elimination of discrimination on the one hand and the establishment of harmonized or common policies on the other. Obviously, the benefits are comprised of access to a larger single market, which has enabled a number of benefits: improving competitiveness, productivity, promotion of scientific and technological cooperation, greater mobility of factors of production, the use of economies of scale, economic and monetary stability, and the use of EU Structural Funds. In practical terms, there is improvement of not only internal properties of the given economy, but also their relative position in the „world"market.

Closely related to economic are political reasons. It is known that the establishment of a common political heritage underlined the objective of closer connectivity. After the fall of communism in Eastern Europe has weakened the political motivation of the EU in terms of contrast and polarization system to Eastern European block. It is still, according to some authors, reflected in the preservation of high standards of social amenities and cultural specificities of the EU (Michelmann, 2004).

For these reasons, the methods of „inputs" and „outputs" should define the ways in which a country can access the EU as a sort of exclusive club, and the ways in which it could possibly leave this club. Under conditions of „cold war" and the deep division of Europe, there were not practical reasons to clearly define the „input „and" output". Namely, instead of the exit there is effective protection of the right of veto. But in a situation where a deep and fundamental change in the whole of Europe was performed, and global institutions, associations and organizations (UN, WTO, IMF, World Bank, NATO, etc.) began redefining its role, it is essential to have a clearly defined „input" and „output" option. In such conditions of global change, the input option has become interesting for the remaining members of EFTA, as well as for all the countries in Central and South-Eastern Europe. Interestingly, the exit option has not been used, except in one case, when Greenland left i.e. its special status was regulated. Given that most of the EFTA countries have joined the EU (except Switzerland, Norway, Iceland and Liechtenstein), the Western Balkans countries appear to be the most important group of candidate countries for full membership in the EU.

Due to the proximity, economic importance and policy driven by deeper integration, the EU has taken on the role of creators of political and economic relations between these countries in order to accelerate the process of their (re)integration into the world economy. The accession process was also started in 2000 with the signing of the Stabilization and Association Agreement, under whose influence were also developed and function economic institutions, policies and performance of the Western Balkans. Some authors refer to these countries, which have started the process of systemic socio-economic transformation or transition, as „the new European democracies". It should be noted that the Association does not necessarily lead to EU membership. According to H. P. Ipsen (Ipsen, 1992) joining is a long-term relationship of a state that stands outside the Union with the EU, which remains intact in terms of their organs and internal structure. So, part or limited membership cannot be achieved by joining. What is most commonly achieved by joining is a fuller participation of associated countries in the objectives of the Union, so that the relationship goes beyond the framework of conventional international trade agreements. This practically means that the EU and associated states become equal partners, whose cooperation is institutionalized at a higher level of mutual relations. Regarding the establishment and content of relations joining, there are special rules. They are associated to the sets in the „middle" position between full membership and the usual contractual partnerships. However, it is possible to properly define three conditions for joining the EU, which are related to the geographic, political and economic dimensions. The existence of these conditions can be partly inferred from the Treaty of Rome, partly on the basis of content agreements with certain countries that the EU has made so far.

Unlike joining, where there are virtually no geographical restrictions, full membership is „reserved" for European countries. Even though it was a clear criterion, it seems it is not realized to full extent. Greenland, for example, is thousands of miles away from Europe and closer to the United States. Malta may geographically belong to Europe and Africa, but culturally, historically and politically it is a part of Europe. At least there is clarity in Eastern Europe, where some believe Poland, Slovakia, Hungary are the borders of Europe, while others believe it is the Urals. A special case is that of Israel, whose population comes mainly from Europe, whose economic and political system is consistent with West-European, although the country is geographically located in Asia.

Economic conditions include, above all, a market economy with a dominant private property as a form of property rights, the economy open to the world, a certain degree of competitiveness, and even a certain level of social welfare. In the initial stages of the expansion of the EU, a number of authors (correctly) pointed out an assumption related to the EU enlargement policy. In fact, it is often the prevalent opinion that only the high and middle-income countries are eligible candidates for full membership. It is inconceivable that a poor country emerges as a serious candidate. Although at first glance this approach can be estimated as wrong, it is not for at least two reasons. The first relates to the conditions of accession and the other is tied directly to the level of economic development of the candidate. For the explanation of the first reason, it should be noted that during this period the terms that candidate countries must meet in order to become full members have not yet been precisely defined. In terms of ad hoc acceptance and conclusion of Europe Agreements (early nineties) and it was not possible to draw any concrete and more accurate conclusions. Unlike the Treaty of Accession, „Europe Treaties" or „Europe Agreements" went much further in terms of objectives and content covered. They depart from the wishes of the contracting parties to full membership in the EU, establish gradually assume the obligations of EU treaties by the associated countries (in the provisions on the free market, and mutual assistance) and provide technical and financial support of the EU reform process taking place in the accession countries. Their name, „Europe Agreements", was chosen for these reasons.

Enlargement policy always followed a policy of deepening economic integration. It seems that the fall of the Berlin Wall „came" earlier than the deepening „favored". European agreements served to successfully bridge the gap between the EU wishes to receive all Eastern European countries under its wing and its actual ability to do so, given the demanding phase transformation integration in the monetary, economic, and political union. Also, unlike in the countries admitted to full membership, in economically underdeveloped countries the possibility of joining the EU in principle was always open (in accordance with the Treaty establishing the EEC and the EU). In such cases, any deviation from accepted principles of equitable distribution of rights and obligations is possible, in order to meet the needs of protection of young industries of the developing countries.

According to most authors, the essence of the European Agreements is the same. It edited the economic, political and financial relations between the contracting parties. These relationships have been set up to European agreements from other association agreement which differ in purpose. The goal was obviously associated with membership in the EU countries. This practically means that the purpose of the agreement was to prepare the European associated countries to join the EU, and to allow them to gradually assume the obligations deriving from the establishment of the single market. However, it should again be emphasized that the European agreements do not automatically lead to membership. After the expiry of the transitional period of ten years, they extend no further time limit. Entering of the accession countries to the EU implies, therefore, a positive assessment of the Union that they managed to complete, in the transition period, the economic, legal and political preparations for full membership. In any case, this requires separate negotiations for whose commencement no deadline is scheduled.

The basic elements of the content of the European Agreement are:
- Trade liberalization without entering the customs union. However, the principle of free trade is not included in the so-called sensitive products, which normally account for about 50% of exports of associated countries,

- In the case of agricultural products of associated countries, the agreement made a somewhat easier access to the EU market,
- Associated countries are obliged to harmonize their legislation with the EU,
- There is an obligation of the EU Accession countries to provide technical and financial assistance to implement reforms,
- Freedom payments should be achieved within five years, and the free movement of capital in the double extended period of time,
- Industrial Cooperation aims to encourage the modernization and restructuring of the industry in the associated countries. Especially since these countries were required to create a climate conducive to private investment.

In contrast to the Agreement on cooperation that just require countries to make modifications to certain institutions (and in some cases not even that), the negotiations on the membership explicitly seek possession of „desirable traits" to a particular degree. This is done for two reasons. First, to ensure the compatibility of economic, political and legal systems of the countries acceding to those in the EU. Second, the acceding countries may not function properly after joining the EU. The single market, for example, requires a high degree of competitiveness of firms and sectors of the economy, and if it were not the case with the state of the new EU, there would be difficulties, both in the new associated country and the EU as a whole. Earlier EEC and now the EU have always insisted that, for them it was not just words on connecting economic, but also political character. Political terms should encompass functioning democracy, separation of powers, a multiparty political system, the rule of law, respect for human and minority rights and the like.

In addition to meeting some of the general conditions specified on both sides there must be a willingness to join the EU. It is important to note that the mentioned conditions for the admission and access to the EU are necessary, but not sufficient. In addition to meeting the formal requirements by potential candidates for membership or accession, the EU bodies, notably the Council and the Commission, estimate other content-items and their possible suitability for membership.

Due to the continuous expansion, what is practically gained is the impression that the EU can only go in that direction, but not to be reduced. If the EU is a community that promises its members and provides a profit (no matter what it may contain), then under certain conditions, it must have (predicted) the exit option as well. It is unlikely that the individual states could make use of an exit option for pure exhibitionism or because of some small differences, because they would be playing with their great interests. „Put out" would actually be an effective opportunity for those countries that believe that some common decisions violated their vital interests. It seems that the „exit option" was also a kind of safeguard clause for minorities by the majority - and to measure the ultimate protection.

The nature of the game in terms of „inputs" and „outputs" of the EU depends on the behavior of specific players. Obviously, the Austrian entry into the EU represented a strong argument in favor of a future receipt of several other countries, with which Austria has strong economic, political and historical ties (such as Slovenia, the Czech Republic and Slovakia). Also, the entry of the Scandinavian countries (Finland, Denmark, and Sweden especially) was a strong pressure for the EU enlargement to the Baltic countries (Latvia, Estonia and Lithuania). We should not forget that these are small countries that are geographically located on the border of Russia, as every economic and political arrangement gives strategic importance. On the other hand, the possible withdrawal of Germany from the EU would bring into question not only the initiated expansion of the

EU to the East, but also the survival of the EU as a whole. On the basis of the above examples, it can be concluded that, although the formal rules of the game (in the sense that it is equally applicable for each country), the presence or absence of certain states, or key players, could represent an important suggestion, both in terms of further development of the game, and in terms of external EU preferences.

In contrast to the seventies of the last century, when the EU in terms of degree of integration and the number of member states was much more modest, today (and tomorrow) a lot of difficult tasks and obstacles can be put in front of the numerous EU newcomers. The conditions and procedure for signing the Association Agreement, starting with the European agreement, to the special Stabilization and Association for Balkan countries, have so far been repeatedly changed. It is known that the last twelve new member states underwent an extremely expensive and almost „traumatic" period of adjustment, especially in the economic sphere, that their membership requirements were seriously considered. A major problem in the process of joining the EU is the circumstance that the fulfillment of each of the set of criteria has economic, social and political costs that the countries, at least at that moment, are not able to accept.

## 2. HELP ECONOMETRICS IN MEASURING THE EFFECTS OF ACCESSION

The first theoretically and empirically based approach to evaluate the economic effects of integration, dating back to the 60s of the last century, is a sort of ex - post evaluation. The basis of these attempts has been the so-called partial equilibrium models. One of the more successful is the Balassa coefficient (1975) which included the effects of market growth (increase of productivity, reduction of operating costs, increase of competitiveness, economies of scale), and evaluated the effects on GDP growth and investment. Also, it is important to mention Smith and Venables' research (1988) regarding the assessment of the effects of the single market. The authors focused on the ten industries, given the scenario assessment of future effects of integration (the ex - ante evaluation). However, what most authors observed are severe restrictions on access to partial equilibrium. For these reasons, this method gave way to models of general equilibrium (Computable General Equilibrium - CGE) or macro models. Numerical values in CGE models are based on credible assumptions and macro-alone rely on econometrically-estimated equations. Now it was possible to examine the interdependence of the various sectors and assess the overall effects and redistributive effects on the economy as a whole. In 1992 Gasiorek, for example, developed the work of Smith and Venables (1988) and turned it into the general equilibrium model calculating the long-term effects of European integration. In later works, the author has expanded the circle of countries studied to include Spain and Portugal, in addition to the earlier „European Six", Great Britain, Greece, Ireland and Denmark.

With respect to the macroeconomic effects, well-known is the Cecchini report (1988) compiled for the European institutions, assessing the micro and macro effects of the formation of a single market in 1992.

### 2.1 Cecchini report

The focus of the Milan summit (in 1985) has been the creation of a single market that would contribute to the liberalization of world trade, offering new opportunities for trading partners of the Community. Increased competition on the Community market, which

prevents the removal of internal barriers, would have an impact on companies from countries outside the Community. The decisions were made concrete in the form of the Single European Act (SEA), and the Program for the completion of the internal market in the EU became known as the Program in 1992. Adopting the White Paper on the Single Market planned the removal of physical, technical and fiscal barriers in order to achieve the EC single market. The SEA came into force in July, 1987 when the amendments to the Treaty of Rome were introduced, and were related to the reduction of the number of questions that were asked for unanimous decision-making. As a consequence, it was not possible to dispose certain proposals for years because one or two Member States objected to them.

The Program was initiated in 1992 because of the belief that it would lead to significant economic benefits for the countries and peoples of the Community. In an attempt to quantify these benefits, the Commission apointed Paolo Cecchini to chair the Committee of Experts. His report, published in 1988, was based on research and Industrials 11,000 econometric model provided a more realistic prediction of functioning of the single market. In fact, the introduction of the single market is expected to remove barriers to reduce production costs, and on that basis, lead to a fall in prices, which would only accelerate wider competition. Lowering the price to stimulate demand, and thus, indirectly, offer or production. Its increase is expected to result in further cost reductions due to increased scale of production. The Cecchini report predicted that profit from the removal of trade barriers would be 0.2-0.3% of the GDP of the Community, that the profit arising from the removal of barriers to production (firms entering foreign markets) would be 2.0-2.4% of GDP and that the effects of the increase resulting from economies of scale would amount to 2.1-3.7% of GDP, which meant that the total expected profit amounted to 4.3-6.4%.

Table 1 shows the expected results of operation of the single market on some of the main macroeconomic indicators in the EU. It is obvious that the largest gains were expected from the liberalization of financial services and the effects on the supply side. Most of these effects came as responses from the business sector to more competition, ranging from the use of more efficient techniques to economies of scale.

**Table 1.** Examined medium-term macroeconomic consequences
of market integration in the EU

| Nature of implications | Process | | | | | |
|---|---|---|---|---|---|---|
| | Removal tariff formalities | Public procurement procedure | The liberalization of financial services | The effects on the supply side | The average value | The range |
| Change in GDP (%) | 0.4 | 0.5 | 1.5 | 2.1 | 4.5 | 3.2 – 5.7 |
| Change in consumer prices | -1.0 | -1.4 | -1.4 | -2.3 | -6.1 | -4.5 – -7.7 |
| Change in employment (000) | 200 | 350 | 400 | 850 | 1,800 | 1,300–2,300 |
| The change in the budget balance (% of GDP) | 0.2 | 0.3 | 1.1 | 0.6 | 2.2 | 1.5 – 3.0 |
| The change in the balance of payments (% of GDP) | 0.2 | 0.1 | 0.3 | 0.4 | 1.0 | 0.7 – 1.3 |

Cecchini, P. (1988), The European Challenge: 1992, Bruxelles: European Commission.

It is evident, too, that the macroeconomic effects of EU integration were pretty good, starting with the GDP growth of 4.5%, decrease in the price level of about 6%, and the creation of an additional 2 million new jobs. Of course, the market integration needs to be completed, requiring several years to make these numbers become a reality. The Cecchini report suggested that greater profit can be realized based on the balance in the budget and balance of payments of the member countries. Improving the balance of the budgets of the member states to only 0.7% of Community GDP, would increase GDP by about 7%, with about 5 million new jobs, without increasing inflation. It was considered that positive economic developments in the EU had a positive impact on global economic trends, as they acted in the direction of encouraging competition, lower inflation, stimulating demand and supply.

The analysis of the data in Table 1 provides answers to a limited number of questions. The report provides insight only into the benefits that followed the unification of markets without indulging in the cost analysis, on the other hand. For this reason, it was necessary to supplement the cost-benefit analysis of forecasted costs of the single market. However, follow-up costs were very difficult, both because of the comparability of the same, and the changes in the competence of the Community. The percentage of expenditure in relation to the total income of the EU has, of course, grown with the increasing competence of the Community/Union. In 1970 it amounted to 0.74% of the total income of the EU member states, in 1980 it was 0.80%, in 1990 it was 0.96%, and in 1995 it reached 24.1%. Out of the total EU expenditure, the expenditure on agriculture accounted for nearly half (49.3%), the Structural Funds 30.5%, the administration of the Union 4.8%, the external activities of the Union 6.3%, research 3.6%, internal politics 2.1%, Development Fund 2.9% and ECCS 0.5%. The EU expenditure normally represents about 2.5% of total government spending of the EU member states. Comparing the prices of public goods by the Community/Union offers and expenditures shows that the integration brings profit. It was also higher due to the fact that the expenditure on agriculture and structural adjustment virtually seized the cost of the Community/Union, as they returned the economies of the member states.

Reliance on the mechanism of economies of scale often leads to a merger in larger firms (mergers and acquisitions), and the high competitiveness must be maintained through imports and foreign direct investment. It is one of the reasons why seeking to enter the EU market is relatively easy. If it were not so, then the industry and other activities would rapidly internalize and exhaust the effects of economies of scale and develop the so-called X - Inefficiency. X - Inefficiency refers to a situation in which the total costs of the company are not reduced, although production is not a result of the maximum relative to the deployed resources. Thus, if a common market is not open, competition and efficiency would decline, and that would cause the anticipated benefits never to occur. It just says what the importance of a liberal approach to solving economic and political problems was.

Although the EEC and later the EU itself contained both liberal and regulatory elements in the development of its institutions, for decades, it seemed that the regulatory approaches have the advantage. Integration has mainly been followed in attempts to accomplish through legislation a greater degree of harmonization of conditions and the homogenization of the economy, which was wrong. Harmonization took place through harmonization of laws and other regulations, through imposing similar or the same standards, and even through attempts to standardize prices. It was a tragic mistake, and

luckily made just in case of the standardization of agricultural products. Over time, the more liberal approach has taken precedence. The reasons for the change are likely to be numerous, and they are both internal and external. Researchers and decision-making bodies in the EU noted that it was not easy to reach a consensus, even on such seemingly trivial matters, such as what is ice cream, and what is yogurt. For these reasons, the EU institutions, increasingly began to rely on connections based on differences, i.e. the competitive regulation. This practically means that the EU body is increasingly limited in defining the rules of the game, and that is therefore left to the actors to decide on how to utilize this space. Generally speaking, today, liberal policies are not routing their liberal rivals, but they have taken the initiative and signatures. Persistence in this regard was not only important for the concept, but also for the success or failure of the entire EU. A clear indication that the EU continues to present a strong regulatory power was the strong pressure for homogenization of labor legislation.

There was a lot of debate about the Cecchini report later. Skeptics have pointed out that the removal of a large number of small barriers to trade, when the effects of the economy are already used, has a negligible impact on the volume of trade, so that the overall positive effects were smaller than the report predicted. Critics of other species have complained that the report did not take into account the dynamic effects (which is true, because it referred to one-time effects) and therefore underestimated the overall positive effects by three to four times. This assessment is excessive, as it were, and some are skeptical about the assessment of the overall effects of integration. At that time, non-tariff barriers amounted to about 17% of the total cost, it is suggested that there may be significant effects on the basis of economies of scale. In addition, a lot of service sectors such as finance, communications and information before the creation of the single market were very well protected from competitors. Hence, the fall in price will very likely have significant effects on the supply side. However, it is interesting that none of these critics disputed the fact that positive effects  exist. After all, the debate about the effects of the EU has continued after its formation.

In October 1996, the Commission prepared a progress report, which showed that during the first three and a half years, GDP grew between 1.1% and 1.5%, the investment was 2.7% higher and that created 900,000 new jobs. Inflation is also significantly reduced, but there were a few „black holes", mainly because some member states did not adequately implement the Single Market Act (this was particularly the case with regard to public supply). The inability to agree on a common system of VAT collection meant that manufacturers still have to face the enormous paperwork, and that there was no progress in the harmonization of taxes certainly seemed restrictive on trade flows. In March 1997, Mario Monti, the former EU Commissioner for the Internal Market, demanded vigorous action to create a single market until the scheduled start of Monetary Union on 1 January 1999. Although the goals were not fully achieved, there was a significant progress in the field of taxation, intellectual property and prevention of piracy and counterfeiting, as well as in the field of financial services by adopting a general framework of legislative measures. At the summit in Lisbon in 2000 and Stockholm in 2001 when they were supposed to solve issues of financial barriers, create conditions for a more efficient labor market and, finally transform the EU into the most competitive region in the world, these problems were only partially remedied. Generally speaking, the single market, today, essentially, has a few gaps which a resolution is expected to mend in the near future.

The Cecchini Report with the mentioned disadvantages is a good starting point for the design model to measure the effects of EU accession. Arguments in favor of such an

assertion lie in the gradual research model. The assessment of the effects of accession should start by reviewing business activities, analysis of trade barriers and sectoral studies. The second step would be carried out through the analysis of the model of supply and demand, with a focus on the collection of direct and indirect effects - multiplier. The third, but not least is the analysis of the effects of economies of scale, after which would follow the study's overall competitiveness of the economy. The basic criticism of the Cecchini report (a static assessment of the economic effects and too optimistic estimates of the positive effects of integration) is largely corrected by the emergence of new models for the evaluation of the integration process.

## 3. MODELS OF COST-BENEFIT ANALYSES AFTER THE CECCHINI REPORT

In order to remedy the lack of the basic Cecchini report (a too static assessment of the economic effects of integration), in 1989, Baldwin transformed the Cecchini report into a dynamic model with short-term and long-term effects of integration. The analysis showed that the medium-and long-term gains from the integration were almost twice higher than in the Cecchini report, where the effects were evaluated between 2.5% and 6.5% growth in GDP assuming the Single European Act in 1992. Haaland and Norman (1992), on the other hand, presented a simultaneous study in which the core of the research were the economic effects of alternative scenarios, starting from regional enlargement of the European Union and EFTA countries without this increase. The conclusion was that there are positive effects for all participating countries of the enlargement process, and for the members of the EC and EFTA. In another paper, Haaland and Norman (1995) calculated the effects of the reallocation of resources (inflows and outflows of capital), with the conclusion that the EFTA countries would benefit from the goods and services sector, and encounter a loss in the capital movements sector.

Using a general equilibrium model, Keuschningg and Kohler did extensive research from 1994 to 1996 when they calculated the effects of the integration on the budget (for Austria, Sweden, Finland and Norway). The profit for the new member states in terms of GDP ranged from 0.5 to 1.4% of GDP. In their next survey (1999), the same authors investigated in more detail the effects of integration on Austria, starting with the theory of various scenarios of economic policy and the results of quantitative simulations. In addition to specifying the theoretical and empirical research in the field of cost-benefit analysis, they developed a simultaneous macro econometric model. It involved modeling certain parameters - aggregate supply and aggregate demand, labor market, the household sector, investment, government and foreign trade. The main conclusion was that EU accession would have a positive global impact on GDP growth (about 1%), welfare, foreign trade, competitiveness, available capital, employment and the fall in prices, but also some negative effects on certain sectors.

The first studies that are directly related to the assessment of the effects of EU enlargement in Central and Eastern Europe, are often associated with the names of Hamilton,Winters, Baldwin, Breuss and Schebeck. Using the so-called Gravity model, Hamilton and Winters (1992) were able to calculate in various works the long-term potential of trade between geographically close countries. The basic idea of the model was that the volume of foreign trade between the two countries is directly correlated to their size and distance. In practical terms, it is important to intensify cooperation with the

countries geographically close to the EU countries (such as Austria, Germany, and Italy) and, to a large extent, increase the volume of foreign trade, even by four times. Brown (1997) using a kind of general equilibrium models (Michigan Model of World Production and Trade) calculated the effects of EU enlargement for three new member countries: Poland, the Czech Republic and Hungary. According to Brown, the gain for the new member states ranged from 3.8% to 7.3% of GDP, while for the EU itself the extended benefit from these countries was entirely symbolic - from 0.1% to 0.2%.

The co-author work by Francois, Portres and Baldwin (1997) developed the first detailed scenario of the effects of enlargement of the EU, both for Member States and candidate countries. Interestingly, they used a simultaneous macroeconomic general equilibrium model which did not take into account the cost of adapting the new members and the adoption of the *acquis*. A very reserved attitude towards these cost categories was, according to the authors, a consequence of the inability of their real quantification. Also, in the development of two parallel scenarios - conservative (pessimistic) and the less conservative (moderate) - were used both the assumptions to reduce the cost of foreign trade on the basis of integration (from 5% to 15%) and reduction of the risk premium (from 0% to 15%). The study included a total of ten candidate countries for full membership (with the exception of Malta, Cyprus and Turkey), and the following types of effects: the effects of trade liberalization, the effects of reducing the risk premium and budget effects. The gains for the new members were estimated to be 1.5% to 1.8% of GDP, while for the „old" member states about 0.2% of GDP.

In the framework of this model especially analyzed were the effects of the participation of five countries called Visegrad group (Poland, the Czech Republic, Slovakia, Hungary and Slovenia) in the EU funds after switching to full membership. On the basis of the current data, it was estimated that the average GDP growth in these countries would be 5%, the gain from the Cohesion Fund should be around 26 billion euro, from the Structural Funds around 12.8 billion euro, from CAP 5-30 billion euro. Total net gains for the new member states, with the deduction of about 23 bn euro under the mandatory annual allocation of 1% of GDP in Member States to the EU budget, according to these estimates would amount to about 50 billion euro! It is obvious that these data are overly optimistic, perhaps even unrealistic. For these reasons, the true picture of net profit based on the integration can be obtained only by adjusting the (exclusive) costs of adaptation and implementation of the *acquis*.

A series of empirical studies were carried out by Schebeck and Breuss (1999) who used a similar simultaneous macroeconomic model. The focus of their interest was to quantify the effects of EU enlargement for the period to 2010 primarily for the Austrian economy, but also for the candidates. The main conclusions of their study are:

- The costs of EU enlargement would move about 80 billion Euros, of which 12 billion for the CAP, 40 billion for structural policies (which are also used for the candidates), 6 billion for administrative costs and another 22 billion Euros for the other five candidate countries (groups of Helsinki). This amount is about 4% of GDP in the first five candidate countries and about 0.2% of the GDP of the European Union;
- GDP growth in Austria to 2010 was 1.3% higher than in the case of no extension after 2004. It was expected that 27,000 new jobs would open, price would fall by 1%, the reduction of the budget deficit to 0.4% and increase in current account surplus of 1.6% of GDP;

▪ Analyzed and direct trade effects, the impact on FDI, as well as the overall macro-economic parameters (GDP, current account balance, budget, unemployment, consumption).

One of the most comprehensive studies of the economic effects of the EU enlargement up to June, 2001 is entitled The Economic Impact of Enlargement. It was presented to mark the ten-year development of the 10 countries in transition (the candidates for full membership at that time), with special emphasis on the macroeconomic effects, effects on labor migration and effects on agriculture.

The mentioned model in this research was used later by some researchers to assess the clustering effects of EU enlargement as well. The goal to be achieved was to define a possible way - a form of behavior of costs and benefits over a period of enlargement and immediately afterwards so that these effects follow a qualitative way. It was observed that when the effects of a candidate are almost always positive, they are accelerated in the aftermath of the full membership, and there is a slower rate in the period before accession and after reaching EU standards. In the second group of countries (EU), the benefits were greater than the cost of the pre-accession phase, and after reaching the EU standards (when costs are significantly declined), while expenses grew very shortly after the enlargement. So, for all candidates who see their future as full members of the EU, it is essential to have the knowledge of the effects that membership brings to a country. In order to facilitate their identification, a general classification was made to direct - that can be directly calculated and imply a precise quantitative determination, and indirect - that are primarily related to sectoral effects, the effects of resource allocation and redistributive effects of income and wealth. Therefore, the main direct effects would be:

1. The effect of trade creation, which involves changes in domestic demand due to the elimination of tariffs and non-tariff barriers and lowering import prices (Trade costs reduction) in the country that is approaching integration, which intensify trade between the member countries of integration;

2. The Trade diversion effect means slowing foreign trade flows to countries outside the European integration, or changing direction of foreign trade to countries within the integration at the expense of countries outside the European integration;

3. The effect on the balance of payments which is directly dependent on the previous two effects, because they mostly affect the improvement or deterioration of the balance of payments;

4. The budget effect (Government Revenue effect) implies a change in budget revenues due to the reduction or elimination of customs duties and other barriers, leading to lower revenue per unit value of imports, but to higher total revenues from growth in the volume of trade, expansion and revenue base. This effect is often also called the transfer because it includes all funds (Structural and Cohesion) and resources (based on CAP and pre-accession assistance) that go to the candidate countries from the EU budget. The aforementioned transfers significantly affect the growth of investment, employment, income, and finally, GDP of the new member states;

5. The effect of the growth of the welfare and living standards of consumers (Welfare effect) is achievable due to lower import prices and limit monopoly pricing strategy and market segmentation.

On the other hand, the indirect effects of integration are:

1. Sectoral effects, which include the impact on production, employment and trade volumes by sectors;
2. Effects on resource allocation and redistribution of income;
3. Effects of the terms of trade are determined by changing the purchasing power of the country's exports, which is approaching integration, due to changes in export and import prices of products;
4. Effects on improving the international competitive position of a country becoming a full member of the European Union are defined on the basis of more privileged to cheaper factors of production and, therefore, more competitive (with lower costs and prices) production;
5. Effects of commercial rents, which arise due to differences between higher domestic and lower import prices;
6. Negative effects caused by adjustment costs, on the basis of:
   - Shaping the institution in accordance with EU requirements,
   - Application of rules deriving from the acquis, the most important being those in the field of standardization, agriculture, transport, energy, environment,
   - Falling production and rising unemployment (in the first years of membership), and the creation of so-called negative effect due to the manufacturing of opening up to foreign competion, and
   - Adequate social programs for workers who lose their jobs.
7. Indirect political benefits in the form of:
   - Use geo-strategic advantages due to EU membership,
   - Support of stability, democracy and the rule of law,
   - The increase in international security, and
   - Growth of FDI and GDP due to the reduction of political risk (The Risk Premium Effect).

### CONCLUSION

Enlargement is one of the most powerful tools of EU policy. The attractiveness of the EU has helped to transform the countries of Central and Eastern Europe into modern, well-functioning democracies. It has inspired far-reaching reforms in the candidate countries and potential candidates. All European citizens benefit from having neighbors that are stable democracies and prosperous market economies. Enlargement is a process that is carefully managed and that helps the transformation of the countries involved, extending peace, stability, prosperity, democracy, human rights and the rule of law across Europe. Euro optimists are happy to point out the above mentioned facts when they want to show the benefits of joining the EU. And benefits alone. The costs are somewhat hidden behind the view that the country's accession to the EU has virtually no alternative. For this reason, almost all the countries that joined the EU as a major foreign policy priority emphasized membership in the EU. Models to provide the most realistic picture of the benefits and costs of membership in the EU are reluctantly used for the purpose of economic analysis.

If we were to give a general assessment of the effects of integration and success of their quantification, it could be said that the possession of appropriate macroeconomic

model and relatively usable statistics *conditio sine qua non* of successful analysis. The EU15 is, for example, all the time, preparation and application of expansion strongly dominated by the view that it is used in light of cost and is useful for the expansion of the EU15. Authors who have to prove it generally use very complex models, which may not be reliable (because the reality is unpredictable and complex). That is possibly a useful extension for EU15, but it does not mean that it is harmful for 10 or 13 new countries. The models are, according to some authors, often a mere „smoke screen" that allows you to prove what you want. The actual effects of the expansion can be anticipated, but their accurate quantification is hardly possible. It is not surprising, because in the process such complicated calculations are too complex to be accurately performed. In order to develop high quality studies of comparative analysis of the costs and benefits of accession, of great benefit may be the experience of the newcomer countries in terms of costs incurred and estimated earnings. Only in this way would it be possible to apply the appropriate mathematical and econometric technologies that successfully presented the real economic assessment of the effects of European integration.

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# EFEKTI PROŠIRENJA EU U EMPIRIJSKIM MODELIMA

*Literatura posvećena EU često ističe njenu hibridnu stranu koja se nalazi u procesu stalne transformacije. Proces je sveobuhvatan, u ekonomskom, političkom i vojno-bezbedonosnom domenu. Ovaj kompleksan zadatak nije vremenski ograničen jer je shvaćen kao proces, a ne jednokratni čin. Nije napuštena prvobitna ideja da se društvene promene evolutivno razvijaju i da traže vreme za prelazak u kvalitet. Iako je današnje okruženje EU veoma promenjeno u odnosu na ono iz kasnih pedesetih godina prošlog veka, osnovni razlozi da bi neka zemlja pristupila Uniji su ostali praktično isti. Svi oni u svojoj osnovi imaju iste težnje potencijalnih zemalja kandidata za članstvo: političke, ekonomske, kulturne, bezbedonosne i dr. Posedovanje odgovarajućeg makroekonomskog modela i relativno upotrebljivih statističkih podataka predstavlja conditio sine qua non uspešne analize odnosa koristi i troškova pristupanja EU.*

Ključne reči: *proces pristupanja, EU, efekti pristupanja, Čekini izveštaj, empirijski modeli pristupanja.*

Review paper

# NEW ORGANIZATIONAL FORMS SUPPORTED
# BY THE INFORMATION AND COMMUNICATION TECHNOLOGY:
# THE CASE OF SERBIAN ICT INDUSTRY

*UDC 004(497.11)*

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**Abstract**. *In today's business environment which is constantly changing, organizations are faced with the imperative to build their competitive advantage through reshaping existing resources and capabilities and through creating new ones. Therefore, organizational design has been imposed as an important factor in the business success of the modern company. There are many examples that traditional organizational forms have experienced transformation: they have moved from organizational forms toward new organizational forms. It has also turned out that the basic support for this transition was the introduction of the information and communication technology (ICT) in companies' operations. Consequently, ICT companies, as the most advanced companies, have become the leaders in introducing the new organizational forms in their functioning and facilitate introduction of new organizational forms in other organizations. In this sense, the aim of this paper is to present new organizational forms based on ICT and, on the example of the ICT industry in Serbia, to show how ICT supports their implementation. Special attention will be put on the advantages which new organization forms generate in terms of flexibility and integration of creative potentials, but some disadvantages will be analyzed as well.*

**Key Words**: *Organizational forms, new organizational forms, information and communication technologies.*

## INTRODUCTION

Organizational design, which is expected to be the support to the organizational efficiency and effectiveness, has become a strategic organizational resource and managerial tool which enables organizations to do the right things in the right way in given circumstances

concerning their current financial and human resources. Until the eighties of the 20<sup>th</sup> century, organizations were building their success on the organizational design which was based on the principles of bureaucracy (specialization, standardization, formalization, centralization). These principles, however, were appropriate only for the conditions of mass production, mass markets and homogeneous environments. Today, business environment has changed significantly compared to the previous one. Managers are faced with the challenge to design the organization which will be flexible enough, innovative and integrated. All these features are at the same time features that will ensure long-term competitiveness of the organizations.

Managers today are mostly aware that organizations cannot be successful if they run the business using old routines. They realize that in order to make their companies competitive they often have to adapt or change previous competitive strategies and then to change or adapt the organizational form. It turned out the last one has become one of the most important topics in the management literature since many authors saw changing the organizational forms as a tool for the improvement of organizational efficiency and effectiveness (Romanelli, 1991; Schreyögg and Sydow, 2010). The major catalyst for creation and implementation of novel organizational forms (Nault, 1998), which are named „new organizational forms" in literature (Daft and Lewin, 1993), was the information and communication technology (ICT). Although the ICT has many influences on organizational operations, in terms of organizational design it also enables substantial changes, both in internal and external organizational forms. There is large evidence that new internal forms of organization and work processes can lead to higher performances and raised organizational competitiveness because of the reduction of hierarchical levels, enhanced employees' creativity etc. In terms of new interorganizational forms ICT enhanced the existing and establish new cooperation forms between enterprises (networking) which facilitate access to global markets. Knowing these facts it could be said that ICT at the same time is the factor and the component of organizational design.

New organizational forms (NOF), generally speaking, were created on the basis of the previous ones and redesigned with hard and soft elements in the way that adds value and eliminates their disadvantages and limitations for use in new conditions. With the NOF, organizational design has become not only the factor for high performance and competitive advantage, but also a strategic resource that companies cannot purchase on the market or copy from others (Miles and Scaringella, 2012).

Having in mind the importance of ICT for creating new organizational forms, this paper will deal with the analysis of these forms. Special attention will be placed on their advantages which could be used for enhancing organizational performances, but we will point out some of their potential disadvantages, too. Starting from such defined task, we will deal with two related issues: new organizational forms and information and communication technology. This paper will also deal with the analysis of the Serbian information and communication technology industry (ICT) which represents the highly competitive export-oriented industry in Serbia and very attractive industry for young talents. Employees in this sector have understood best that competition is no longer based on traditional resources, combining raw materials, labor and capital, but that the competitive advantage is based on knowledge. By using this example we will try to answer two questions: (1) Is it possible to improve competitiveness of companies in Serbia by using information and communication technology, (2) What new forms of organizational design should be used in order to improve competitiveness of the company?

## 1. ENVIRONMENTAL CHALLENGES THAT ORGANIZATIONAL DESIGN MUST RESPOND TO

Business environment has changed significantly compared to the environment from a few decades ago, challenging management of organizations to design the organization to be flexible, innovative and integrated. The view on the influence of the environment on organizational designing can be divided into three periods (Anand and Daft, 2007).

The *first period*, until the 1970s, was based on the premise that an ideal organization must be independent with clearly established boundaries between its own skills and capabilities and suppliers, customers and competitors. This approach led to organizations in which employees were arranged by functions, or divisions and specialized for certain jobs, with vertical hierarchy and a chain of command. When the increasingly complex environment began to point to shortcomings of traditional organizational structures: coordination between functional parts was difficult, vertically established authority did not provide effective value creation for customers, *the second period* of organizational design started in the 1980s. This period is characterized by redrawing the boundaries of the organization with the aim to improve coordination and communication. Along with these changes, the capacity of information processing increased because of the availability of personal computers and further development of information and communication technology which brought us to *the third period* of organization designing in the mid-1990s. Managers have become aware that organizations can no longer effectively perform all the tasks necessary to make products and services on their own, which caused a shift in the approach to design and a change of organizational models. The concept „boundaryless organization" was promoted; it is based on breaking down the barriers imposed by traditional models: vertical barriers between different organizational levels, horizontal barriers between functions that can cause the effect of functional silos, external barriers between companies and external stakeholders and geographical barriers between nations, markets and cultures. All these barriers lead to extensive separation of people and business processes, which is reflected in increased costs, slow business processes and reduced innovation (Ashkenas et al. 1995). Organizations have recognized the superiority of tearing these barriers down while achieving all the benefits of traditional organizational structures such as specialization and efficiency, that characterize the functional organization, while adapting to the customers and markets, which is a characteristic of divisional organization (Miles and Snow, 1992). In contrast to organizations that were oriented to the size, defined roles, specialization and control, boundaryless organizations are characterized by speed, flexibility, integration and innovation (Ashkenas et al., 1995), and the ability to form a model based on the context that corresponds to the solution of given problems (Baker, 1992). All this makes them a more adaptable organizational structure.

The important lesson for all contemporary organizations can be summarized in the statement that it is important to cooperate, not only with suppliers and buyers, but also with competition.

Generally speaking, the trend of interorganizational linkage was created by the need of constant innovation, improvement and adaptation of outputs to market demands and expectations of consumers. Although specialization and focusing of organizations on certain activities of the value chain have results such as higher productivity, high quality and lower costs which are basic leverage for organizational competitiveness (Porter, 1985) in the globalized market there is a low possibility that a single organization could achieve these results independently. Consequently, in recent times managers have found

the solution in partnerships, or in interorganisational collaboration. Those new forms of cooperation also have concrete goals on the input side as well as on the side of outputs. The inputs which are brought by partner-members are specific resources that members have in possession such as: space, technology, people, knowledge, skills, markets, etc. Basically outputs are the reason why collaborations are made, and they can be: innovations, productivity, quality, learning, new technology, new markets, new higher standards of employees and citizens. In other words, we can say that interorganizational relations are the efficient strategy for concentration of resources in order to improve competitiveness of members and life standards of citizens (Delgado, 2010).

In that way, contemporary organizations recognized that the new strategy for successful business operations in the globalized market could be interorganisational relations. This strategy became a challenge as well as a trigger for the development of internal capacity of organizations for continued growth and development. Many organizations went through the process of internal redesigning in order to get rid of some activities and operations in the value chain, which they were not competent and had no competitive resources for. The canceling of such activities caused the reduction of the number of employees and changes in organizational forms. On one hand, a new source of growth and development of the organization has been found in interorganisational relations and, on the other, they caused size-reduction to the optimal level to make organizations more efficient.

## 2. NEW ORGANIZATIONAL FORMS DEVELOPED IN THE INFORMATION ERA: LITERATURE REVIEW

If the environment and the challenges it imposed caused changes in organizational design, then the progress of ICT is the key factor to support those changes and facilitate the introduction of new organizational forms (Child and McGrath, 2001). But in order to understand how ICT can do this, adequate understanding of what ICT represents is necessary.

From a technological point of view, one group of scientists argues that information and communication technology is any form of information systems based on computers (Orlikowski and Gash, 1994), while others think that information and communication technology is represented by computers, e-mail, voice mail, video conferencing, databases and other electronic devices for storing, analyzing, and transmission of information in an organization (Ott et al. 2011). From a business perspective we accepted the definition that information and communication technology includes three key resources that, when used together, can be a source of competitive advantage of organizations (Ross et al. 1996, p. 33): 1) human resources, 2) technology, and 3) the relationship between ICT and management. Consequently, according to this view, possession of ICT is not a source of competitive advantage *per se.* The key of organizational functioning and success is its ability to attract and retain human resources (Pfeffer and Salancik, 1978), and to establish the appropriate relationship between ICT and management in order to implement technology in the right way. In other words, the *differentia specifica* of the organization stems from a combination of organizational assets and skills which, when applied to well-designed business processes, leads to high value for consumers (McCormack and Johnson 2001). This uniqueness is established within organization, within internal organizational structures, systems and processes and it is strongly influenced by internal factors,

particularly leadership that drives employees and it has a big impact on productivity, innovation and efficiency of work processes.

It is without doubt that ICT has led to new forms of organizational design which removed the barriers imposed by traditional models and form new structures for specific situations (Baker, 1992). Those new forms could emerge since ICT is not simply a tool for automating existing processes, but more importantly ICT influenced all structural elements of organizational design and changed their appearance (Dedrick, Gurbaxani, and Kraemer, 2003, p.1) allowing organizations to experiment to discover new and better practices (Baldwin, 2012). Consequently, new design models emerged which brings new abilities for the 21$^{st}$ century organizations.

In the following text we are going to show nine organizational forms which are most frequently mentioned in contemporary literature and represented in practice: meta-organization, network, virtual, cellular, innovative form organization, platform-ecosystem organizational form, ambidextrous, hypertext, and inverted organization.

**Meta-organizations.** New organizational forms, enabled by the development of the Internet and related ICT technologies, include more organizations and more individuals (Gulati, Phanish and Tushman, 2012), thus, they turned from independent to meta-organizations and represent new foundations on which business strategy is implemented (Marciniak, 2013). Meta-organizations are those organizations whose members, whether they are organizations or individuals, function independently and legitimately in order to achieve system goals. Although meta-organization has not established a formal authority in a contractual relationship, it can have the significant informal authority based on experience, reputation, expertise or control over key resources or technology (Gulati, Phanish and Tushman, 2012). Meta-organizations are largely represented in the ICT industry, in which the leading companies like Microsoft, Apple, Google, SAP and Cisco include groups of developers and globally dispersed small and big companies that are characterized by intense flow and exchange of information.

**Network organizations** can be defined as a strategic response to environmental pressures that provide incentives to disaggregate business functions to specialist partners (Cravens, Piercy and Shipp, 1996). Compared with traditional organizations, network organizations have few essential differences which make them superior organizational forms (Miles and Snow, 1992, p. 55): 1) Unlike traditional organizations that were basically structured with a tendency to internally and independently produce all the goods and services (everything under one roof), network organizations use the assets of several organizations located along the value chain, 2) Network organizations rely on market mechanisms through exchange of information, cooperation; they customize products and services according to demands and needs of customers and for that they have significant help from information and communication technology, 3) It is expected that members of network organizations not only meet their contractual obligations, but also to voluntarily work together to improve final products and services, and, because of that, organizations acquire characteristics similar to Japanese keiretsu - joint cooperation of manufacturers, suppliers, retailers and financial companies.

One manifestation of network organizational form is **virtual organization** which represents a temporary network of independent companies (suppliers, customers, even rivals) linked by information and communication technology to share knowledge, skills, costs and access to one another's markets (Byrne, 1993). The basis of the virtual organization functioning is free and fast gathering, processing, flow of information and mass collaboration,

so without the current capabilities of information and communication technology the virtual organizational form would be very difficult, if not impossible to use. Virtual working addresses the need to break with old, bureaucratic ways of working, and to allow rapid innovation, product development (Jackson, 1999), fluid state that promotes learning, reflexiveness and growth (Allcorn, 1997). As distributed, fluid organization form mediated by various forms of ICT, virtual organization has several implications for management because it represents the opposite of the principals of hierarchy: it has no stability, no clear boundaries of authority and accountability, bureaucracy, and no vertical chain of command (Petković and Aleksić Mirić, 2011).

**Cellular organization** is made up of cells that possess fundamental functions and can operate alone, but also interact with other cells in order to combine the knowledge to spread innovation and strive for new product and service opportunities (Miles et. al., 1997). Each cell is responsible to the larger organization, while the customers of a particular cell can be outside clients or other cells in the organization. Collaboration among cells increases the potential for bringing employees from different disciplines together for short periods of time who would not otherwise have the opportunity to become engaged in the activity (Zammuto et al. 2007).

**Innovative form organization (I form organization**). Organization's innovation success comes from opening up its innovation processes to external sources of knowledge and creativity (Chesbrough, 2006). The I form organization enables companies to compete effectively by focusing them on their core business activities, outsourcing non-core activities to external providers (Miles et al. 2009) and pursuing rapid and continuous innovation through sharing knowledge, experiences and innovative concepts at relatively low cost with advances in ICT (Snow et al. 2008). It becomes apparent that along the entire value chain, suppliers and distributors might have valuable ideas for product improvements or new market opportunities, so knowledge sharing across these actors is recognized as a mutually beneficial process. The main challenge for organizations is to create trust among organizations as the expectation that other party will fulfill obligations, behave predictably and negotiate fairly (Perrone, Zaheer and McEvily, 2003).

**Platform-ecosystem organizational form.** Numerous companies that focus on providing online services and rely on affiliated third parties to provide complementary products and technologies form platform-ecosystem organizational form (Yonatany, 2013). Platforms, as the common components used across a product family (Boudreau, 2010) can be improved by the third parties (Evans, Hagiu and Schmalensee, 2006) when they are used for construction of complementary products and services. This organizational form is very useful in ICT enabled industries where the actions and outcomes of a technology entrepreneur are deeply interconnected with the actions and outcomes by others.

**Ambidextrous organization.** Organizational ambidexterity is the ability to pursue exploitative (efficiency, selection, control, extending existing skills and capabilities) and explorative (search, experimentation, research and development) activities simultaneously (Jensen, van den Boshc, and Volberda, 2006). At first, Tushman and O'Reilly (1996) analyzed structural ambidexterity by recognizing the presence of separate structures in organizations to achieve the desired balance between exploration and exploitation, while latest research introduced the notion of contextual organizational ambidexterity and analyzed the role of the behavioral context in achieving the balance (Gibson and Birkinshaw, 2004). Information and communication technology has proven itself as a factor that can promote the balance of exploration and exploitation activities (Rothaermel

and Alexandre, 2009) and ambidexterity in the development of new products and services according to its primary role: transaction, organizing and processing of knowledge, facilitation of coordination, people networks and collaboration (Revilla, Prieto and Rodriguez, 2011).

**Hypertext organization.** The need for combining the efficiency and stability of a hierarchical bureaucratic organization with the flexibility of the flat, cross-functional task-force organization has led to new organizational form which, according to Nonaka and Takeuchi (1995), needs to be designed and managed as a multilayer, hypertext organization. Organization knowledge is created and supported by information flowing through three layers: 1) the business-system layer, organized as a hierarchy, for routine operations; 2) the project-team layer where multiple project teams are engaged in knowledge creating activities and 3) the knowledge-base layer which does not exist as an organizational entity, but it is incorporated in corporate vision, organizational culture and technology (Nonaka and Takeuchi, 1995).

**Inverted organization** was proposed to facilitate employees contacts with the customers according to the fact that the vast majority of jobs are now service oriented and that the success of organization lies in intellectual capabilities. Former line managers evolve into staff people by removing barriers, expediting resources, conducting studies and acting as consultants, instead of giving orders. What matters is expertise of the professionals, because they work alone to customize products and services for individual customer according to their knowledge and experience (Quinn, Anderson, and Finkelstein, 1996). ICT has reduced the need for hierarchy to manage information flows and coordinate activities because information is becoming available to all employees allowing them to organize around the work itself (Zammuto et al. 2007).

If we examine these new organizational forms, we can notice some of the similar characteristics: 1) development of networks, cooperative relations with all actors in the value chain, association with other organizations; 2) trend towards flatter hierarchical structures within organizations and more cooperative management style; 3) development of a creative, responsive, adaptive, flexible organization; 4) focus on knowledge diversity within partners and facilitation of knowledge sharing and creation, 5) reducing organization to an optimum (rightsizing), focusing on core competencies and outsourcing other responsibilities to other parties.

Reviewing the literature we have found a multitude of new terms of NOF arising from the different perspectives of observations on new organizational forms. A key problem is a lack of clear criteria by which we can distinguish one form from another, as well as the answer to the question whether NOF refers to time or to context. Empirical work has been fragmented, the literature relies on single case studies (Dunford et al. 2007), and there is no unifying theory to interpret empirical findings (Pettigrew et al. 2003). What is undoubtedly so is the fact that NOF can be characterized as a hybrid forms of hierarchy in which decision rights are delegated to lower levels with support of ICT. These are their basic characteristics that distinguish them from the basic organizational forms. In that sense, the degree of delegation of authority and independence of employees are the main criteria by which we can observe variations of NOF.

## 3. CHARACTERISTICS OF NEW ORGANIZATIONAL FORMS: ADVANTAGES AND DISADVANTAGES

Given the analysis of literature review, it is important to be able to consider several important characteristics of new organizational forms:

*First,* all forms, without exception are non-original hybrid structures derived from the basic bureaucratic models.

*Second,* the development of these forms was inevitable because bureaucratic models are rigid, with strong internal and external boundaries and as such have no potential to quickly respond to changes in environment and interorganizational linkages.

*Thirdly,* NOF are flat structures with open internal and external boundaries, with intensive communication, movement of people, information and knowledge sharing.

*Fourth,* NOF are fully supported by information and communication technology, it can be argued that many of them are possible only in the information age (networks, hypertext, platform-ecosystem).

*Fifth,* NOF are very fluid structures.

From the presented characteristics of new organizational forms, we can evaluate their advantages over bureaucratic forms of organization, but at the same time we can observe their disadvantages, as shown in Table 1.

**Table 1** Advantages and disadvantages of NOF

| Advantages | Disadvantages |
|---|---|
| Flexible structure | Structure fluidity may produce conflicts |
| Small number of hierarchical levels | Lack of formalization can reduce individual performance |
| Internally and externally open systems | Lack of bureaucratic rules and procedures may reduce the reliability of output |
| Highly informationized organization | |
| Learning organization | Informal authority in some cultures do not give the expected results |
| Employees have a high degree of freedom for creativity and change | Potential distrust among individuals |
| Strive for innovation | |

Source: Authors

It is clear that new organizational forms cannot function alone and independently from basic forms, and they are actually enhanced bureaucracy, with the aim to achieve the required flexibility, collaboration and transfer of resources (information, knowledge, experts). But, new organizational forms are not simply bureaucracy dressed in a new and refined disguise, they are carefully designed and controlled by a decentralized principle of power (Maravelias, 2003, p. 562). In practice, it is very hard to find the organization with a clear model of some of the new organizational forms. Usually, organizations are dual structures with bureaucracy in basis which ensures stability, and some enhanced structure of new organizational form in order to achieve the flexibility of the system. Our research also indicates these findings, which will be shown in the continuation of this paper.

## 4. RESEARCH DESIGN

**The goal and the object of the research.** The field research was conducted with an ambition to get answers to the starting research questions: (1) Is it possible to improve competitiveness of companies in Serbia by using information and communication technology, (2) What new forms of organizational design should be used in order to improve competitiveness of the company? The object of research, the companies in the ICT industry, was not selected randomly; on the contrary, the ICT industry is a promoter of informatization of society and organizations, it implements and maintains ICT infrastructure in other organizations, and according to literature, it forefronts in the implementation of new forms of organizational design (Powell, 1996), which provides great connectivity and cooperation opportunities in this industry (Miles et al., 2010).

**The importance of research.** The global crisis is reflected in Serbian economy through high unemployment, rising foreign debt, inflation, poor living standard. On the other hand, there are some bright points, such as export of software and ICT services: in 2007, the software export amounted to 62 million euros; in 2011, it was up to 166 million, while in 2012 it exceeded 200 million euros (www.pks.rs) and in daily jargon it can be heard that Serbia is *the country of farmers and ICT specialists (*www.rtv.rs). ICT industry has been recognized by the state as a significant segment for further development of the Serbian economy and the government has adopted several policies and strategies. The Strategy for development and support of the information technology industry is the most important institutional support that should encourage and support the industry in four segments: start-up, outsourcing, development and export of original software products, development centers of large multinational companies (Službeni glasnik RS 72/12).

**The design of the research.** The research was conducted by using the questionnaire technique for data collection: the questionnaire was sent to 40 domestic ICT companies, members of ICT clusters, which both develop and use information and communication technologies. The questionnaire consists of 20 questions designed in order to indicate: 1) the key characteristics of local ICT companies: size, age of the company, number of employees, the opportunities for flexible working hours and working from home; 2) the demographic characteristics of employees in ICT companies: age, gender and educational structure; 3) the manner in which employees perform their tasks and activities, share knowledge and information, communicate; 4) the degree of formalization and centralization, 5) cooperation with other organizations and clients, 6) established organizational form. The collected data from the questionnaire was analyzed and interpreted by the description method. Also, we used the method of analysis and interpretation of data from secondary sources: official statistics, the Ministry of Foreign and Internal Trade and Telecommunications, the Directorate for Digital Agenda, ICT associations, media and, also, an observation method as the authors had the opportunity to spend some time in one of the ICT companies.

## 5. DISCUSSION OF RESEARCH FINDINGS

**Age, size and human resources.** The surveyed companies have been working 5 to 25 years and measured by the number of permanent staff, they belong to the groups of small (58%) and micro companies (42%). The surveyed ICT companies are young if we consider the age structure, since most of the employees (over 80%) are young and younger middle aged workforce that is highly educated - most employees (over 90%)

have a university degree. Because of the lack of functional knowledge, ICT companies pay much attention to training and development: 75% of the surveyed companies responded that they organize internal and external staff training. It can be concluded that Serbian ICT industry is aware that the 21st century is a century of knowledge and that the human capital is at the top of the list of factors necessary for implementation of business strategies. The described situation goes hand in hand with flexible organizational design and modern organizational forms that with ICT support could improve the competitiveness of these companies.

**Communication**. Serbian ICT companies, as supposed, predominantly use electronic means of communication which is very important because most of the surveyed companies allow their employees to work from home (58%), while all companies offer flexible working hours. Compared with traditional communication that was placed in the relation superior-subordinate, ICT strengthens the intensity and flow of information within the organization in all directions, vertically, horizontally and laterally (Hiltz et al., 1986). By rapid increase in the quantity of information and the speed of their transfer from one location to another, ICT significantly reduced communication costs (Henderson and Venkatraman, 1993). Well-developed internal and external electronic communication networks in organizations support new organizational forms (Child and McGrath, 2010). It would not be able to imagine interorganizational relationships, networks, multi-networks, virtual teams, and other NOF without electronic communication.

**Formalization and specialization.** Tasks and operations of surveyed companies are heterogeneous, and include sales, working with information technology, management, administration. Results showed that domestic ICT companies do not have a large number of written rules and procedures, there is no detailed specified job description, so the employees have freedom to perform their tasks in the best possible way at the given moment. However, the companies have an orientation and directing program for new members, as well as written documentation of employees' performance. In performing daily tasks, the surveyed companies use ICT in VAT payment, payment of contributions for employees, for sending documentation to public administration, for collecting the necessary forms and information, which results in achieving significant savings in time. Informatization of the organization enables the general specialization and low level of division of labor among employees, which brings great benefits for both employees and employers: first ones do not perform monotonous work, and the others have the opportunity to have the job done with a smaller number of employees with broader specialization. However, it would be no good to go to the extreme, since the benefits could turn into disadvantages.

**Responsiveness and agility.** The employees of Serbian ICT companies customize their products and services to meet the needs of customers, so they have a sufficiently broad specialization, which allows them to act flexibly. Three quarters of the surveyed ICT companies strive to keep customers, involving them fully in the process of creating products and services, and establishing long-term relationships with them through technical maintenance of implemented products and through expert support. When work process is organized by projects, employees with expertise get a certain level of autonomy, expertise-based power that may affect the development of new products.

**Organizational form.** The project organization through semi-autonomous project teams is typical for the companies in the ICT industry, so in domestic companies we could recognize the hybrid model with features of inverted bureaucracy. In the inverted

organization, experts can independently design and implement the whole project solution for a client, and managers become only support (Quinn, Anderson and Finkelstein, 1996).

Employees in Serbian ICT companies are dealing with complex tasks that require teamwork and interdisciplinary knowledge, as their clients are companies from different backgrounds, and as each customer has specific requirements for the solutions they need. At the same time, the parallel existence of few project groups and the engagement of an employee in several projects may cause problems with planning priorities, coordination and control. In order to take advantage of the small semi-autonomous units and project teams, a good combination and cooperation of formal and informal leadership, interweaving of formal and informal authority and coexistence of bureaucracy and adhocracy must exist in those companies.

The ICT industry in Serbia is a leader in establishing interorganizational relations. In this way, these companies have contributed to the affirmation of a cluster, which is seen in Serbia as a way of connecting big and small employers, entrepreneurs, universities, institutes, government agencies and associations, with the aim to improve the competitiveness of the national economy (Porter, 1998). The literature on NOF recognizes a cluster as a meta-organization that it essentially is, because the structure of the cluster is extremely fluid, it has no professionalized leadership and formal authority (West and Lakhani, 2008). Business and development strategies of ICT companies rely not only on efficient internal organization, but also on establishing interorganizational relations with other organizations and companies. ICT companies, as modern organizations, have realized that both vendors and distributors are good sources of technical and market knowledge that could be used for further growth and development of production and services.

Organizational form of Serbian companies in the ICT industry helps us to be more objective towards linear logic that prevails today in the literature on NOF, in which fluidity and flexibility of the organization are over-emphasized and exaggerated. After spending some time within those companies, it can be seen that the reality is very different from the concept offered by some researchers of NOF. The actual situation inside the companies indicates that the nonlinear logic in new conditions is more applicable than the linear concept (Schreyögg and Sydow, 2010).

Serbian ICT industry currently has the following clusters: Vojvodina ICT Cluster - VOICT, Nis Cluster of Advanced Technologies - NiCat, ICTNetwork Serbia Cluster - ICT Net, which integrate companies in this industry, scientific-research institutes and supporting institutions (www.klasteri.mfp.gov.rs and www.ni-cat.org). Those clusters began their strategic partnership in 2012, in order to jointly improve the business environment and achieve growth faster than the average, innovation and productivity, to encourage the development of new businesses. Financial data for 2010 show that one of the highest turnover is made by the member of two ICT clusters (ICT NET with around 87 million euros and Vojvodina ICT with 44 million euros). Also, cluster members help domestic companies to exit in new markets and increase their visibility using ICT. The biggest exporters among clusters are the members of Vojvodina ICT Cluster (20 million euros) and the third place is occupied by ICT NET (around 10 million euros) (Mijačić, 2011, p. 32). Programming and computer services dominate in the structure of export of computer and information services, followed by embedded systems and system integration.

Newly established networks allow benefits to all members of the chain, through the construction of a multi-network (clustering of clusters) (Miles et al. 2010). Because clusters are geographic concentrations of linked companies, institutions and other entities

important for competition in a particular area, the clusters in Serbia are important for balanced regional development. For this reason, the clusters are also established outside of Belgrade, such as the newest one in Kragujevac, in the Business Innovation Centre (BIC), that brought together companies dealing with information and communication technologies from Šumadija and Pomoravlje, should get the full support from the Government and become the business model for connecting young talents in the ICT industry (Politika, 22 May 2013, p. 14). Balanced regional development is also supported by the fact that Comtrade' software development center was opened in Kragujevac, which employes 200 IT engineers, with promise that there will be 200 employees more until June of 2014 with government support (Politika, 19 February 2014). Comtrade, as a specialized company for ICT solutions, has 16 companies in 11 countries and it largely cooperates with universities, schools and other successful companies.

Clusters in Serbian ICT industry will continue to expand because, besides the experts there is supportive macroeconomic and organizational environment and the increased awareness of all those who have interest in improving the competitiveness of Serbian economy: companies, small entrepreneurs, researchers and government.

CONCLUSION

In this paper we presented the new organizational forms that have emerged in response to the challenge of changes in the environment characterized by the appearance of multi-competition. These new organizational forms marked the end of the twentieth and beginning of the XXI century. A literature review showed that their implementation was possible only thanks to advances in information and communication technology. In other words, the complexity of the new intra- and interorganizational forms, that have been given new manifestations and characteristics, would not be possible if the ICT industry has not progressed in the meantime. Thanks to that fact the organizations and management who make decisions on the choice of organizational design were offered new tools to manage multi-business, employees and interorganizational relations.

This paper also pointed out that new forms of organizational design are very complex and often complicated to understand, but enable decisions to be made in places where knowledge and specialized expertise are located (operational level). At the same time, the new forms of organizational design enable top management to have control over the processes which take place in the operations and to successfully coordinate them.

The research conducted in Serbian ICT industry confirmed to a large degree our initial view that NOF and ICT are in close interdependence. We believe this is an appropriate strategic choice especially in today's business environment where interorganizational relations are highly globalized or where they are established in the form of clusters, which is the case of Serbian ICT sector. We also believe that interdependence of NOF and ICT is the strategic choice which provide modern organizations with successful business and competitiveness in the long term.

The main message that we tried to convey by this paper is that sustainable competitiveness in terms of multi-competition cannot be achieved in the old way and that ICT today allows organizations to use competent employees positioned in a new way in organizing scheme to achieve efficiency and effectiveness simultaneously.

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# NOVE ORGANIZACIONE FORME PODRŽANE INFORMACIONO-KOMUNIKACIONOM TEHNOLOGIJOM: PRIMER IKT INDUSTRIJE U SRBIJI

*U današnjem poslovnom ambijentu koji se konstantno menja, organizacije su često suočene sa imperativom da svoju konkurentsku prednost grade preoblikovanjem postojećih resursa i sposobnosti ili izgradnjom novih. U tom smislu organizacioni dizajn se nametnuo kao važan faktor poslovnog uspeha savremene kompanije. Postoje brojni primeri koji govore da su tradicionalne organizacione forme doživele transformaciju: od organizacionih formi – do novih organizacionih formi. Ispostavilo se da je bazična podrška ovoj tranziciji bila uvođenje informaciono-komunikacione tehnologije (IKT) u poslovne operacije kompanija. Posledično, IKT kompanije kao najnaprednije kompanije, postale su lideri u uvođenju novih organizacionih formi i ubrzale njihovo uvođenje i u druge kompanije. U tom smislu, cilj ovog rada je da predstavi nove organizacione forme bazirane na IKT, a zatim da na primeru IKT industrije Srbije pokaže kako je IKT podržala njihovu implementaciju. Posebna pažnja biće posvećena prednostima koje nove organizacione forme generišu u pogledu fleksibilnosti organizacija i integracije kreativnih potencijala, ali će, takođe, određena pažnja biti posvećena i nekim od njihovih nedostataka.*

Ključne reči:  *organizacione forme, nove organizacione forme, informaciono-komunikaciona tehnologija.*

**Review paper**

# CONCEPTUAL FRAMWORK FOR UNDERSTANDING THE INFLUENCE OF EFFICIENT PROTECTION OF PRIVATE PROPERTY RIGHTS ON ECONOMIC EFFICIENCY

## *UDC 347.233*

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**Abstract**. *Property rights represent one of the most significant structural determiners of efficiency in economic system. Regarding this fact, their content influences the institutional, legal and distribuitive sphere, their effect on economic performances in national economy is complex and substantial. Specific characteristics related to social and economic characteristics of a right holder, making adequate incentives, more complete evaluation, their individuality, exclusivity and free tranferability, combinatory effect, specialisation, productivity, social compactness and organizational complexity, caused private property rights to influence considerable economic potential. Mechanisms for achieving that refer to enabling trade, boosting market and competition forces, reduction of transaction costs and providing adequate motivation for economic agents. Imperfection of political process and the resulting political institutions represent the main causes of inefficient protection and enforcement of private property rights. Specific historical experiencies in developing different national economies distinctly confirm their indesputable characteristics in making national economy to work efficiently and in providing high level of long term economic development and growth.*

**Key Words**: *private property rights, formal institutions, economic efficiency, imperfect political institutions, economic history.*

### INTRODUCTION

Changes and efforts directed towards establishing market economies in former socialistic countries, attempts of building up an adequate institutional structure and performing institutional changes directed towards the establishment of functional market economy in the rest of developing countries represent the most signifficant characteristic

of contemporary economic history. Divergent results of these countries, as well as their relative stagnation in comparison with the developed market economies or too slow process of convergency, require the reconsideration of mainstream theoretical positions, that were used as and that were actually the explanation background for the developing policy. Traditional approaches and economic growth modeling, based on neoclassical, recource based interpretation of economic growth, failed in giving adequate answers for drafting and implementing the appropriate strategies. All these models and approaches could not give substantial answer to the fundamental questions, reffering to the economic growth determination, i.e. what the fundamental causes for economic growth are? Factors used in these models, such as innovations, economy size, education, capital accumulation and so on are not the growth causes. They are growth [35, p. 2].

In order to remove the disadvantages and interpret the economic reality in a more suitable way, a specific approach has been developed for interpreting economic dynamic within New institutional economy. This approach referes to the Theory of property rights which emphasises the necessary conditions for achieving economic efficiency. Property rights represent unique *epitheon ornans* of the whole institutional structure and make the core of the economic process, that results in economic growth. This theory emphasizes that the rights, not the resources, are owned by economic agents [2, p. 17]. Because of this the rights are the subject of exchange on the market and the base for making investments and organizing production. For that reason, if we wish to understand the economic process properly and the causes of economic growth we have to redirect our attention towards the property rights institutions, not towards the physical subject of property rights. Property rights and the institutions in general are considered to be so called "deep determiners of economic growth" and the most powerful explanation and fundamental cause of economic growth in Western Europe [7, p. 140].

Clearly defined and effciently enforced property rights do not only directly influence the quality of exchange and the volume of transactions in national economy, but can be observed as a unique mechanism for transfering various characteristics of economic, social and political system on economic efficiency, such as competition, finacial institutions, the rule of law, quality of bureaucracy or a trust. For that reason, pivotal aim of this work is identification of basic dimensions related to property rights, as well as mechanisms for transmitting the influences of property rights on economic efficiency. Beside it, the aim is to identify the influences coming from institutions of political system which are crucial in determing their clarity and features of their implementation. Thus, we can say that the elementary premise of our paper refers to the proposition that clearly defined and consistently enforced property rights are representing the decesive reguirement for efficient functioning of national economy.

Qualitative methodology research has been used in our research. It has been modified according to the specific subject and the aim of the paper. Constructional elements of methodology approach refer to the usage of comparative and historical method. This implies the analysis of the results of the numerous empiric and theoretic studies which were conducted in order to discover and explain complex linkages between the property rights and economic efficiency.

The work consists of five parts, beside the introduction and the conclusion. The first part is devoted to the analysis of the nature and basic dimensions characterizing the property rights institutions. The second part referes to the identification of specific traits of private property rights that make them superior property regime in terms of efficiency

compared to the other alternatives. In the third part the focus is on the identification of the main mechanisms through which the private property rights influence economic performance. Specific influences of political institutions in determining the clearty and effective protection property rights protection are the subject of analysis in the fourth part. In tha last, fifth section particular historical experiences are stated that were a milestone in the development of certain national economies. The conclusion gives reflections on the summary results of the previous parts, and points to the possible directions of future researches.

## 1. MULTIDIMENSIONAL NATURE OF PRIVATE PROPERTY RIGHTS

Considering the fact that the rules of property rights are among the most significant structural determiners of economic behaviour and performances [26, p. 143], it is necessary to indicate the complex nature of this concept. In that way, the multiple influences they produce on economic efficiency are indirectly emphasized.

Bearing in mind the legal origin of property rights concept, as well as the fact that the prevailing volume of contemporary institutional structure is determined by legal framework, legal perspective is being solicited as unavoidable in determining the substance of this institutional category. In that sense, property rights refer to the right to use goods – *uzus,* the right to earn the income from the goods – *uzus fructus,* the right of suffering the concequences, positive or negative, of the change in value of the goods – *abusus,* as well as the right on alienation of the goods, i.e. *ius abutendi* [20, p. 11]. In other words, the set of property rights refers to the exclusive right of an owner to use the property, to make an income and to administer the property, as well as to transfer control onto another person [15, p. 86]. It is evident, according to the given specification of property rights, that generally speaking property does not only imply „the right" over a certain resource, but the whole set of regulatory rights carried through the legal means. Understood in this way, property rights as well as the rules related to property aim to set up the allocation of resources towards the most productive uses [4, pp. 51-53]. Possible problems in each of these segments may cause huge consequences on economic performances in national economy.

The analysis of the property rights from the perspective of institutional economics indicates that they represent the rights of the individual against certain goods and with it related economically, legally or socailly restricted possibility to consume certain property in any way, i.e. directly through consumption or indirectly through exchange [14, p. 99]. For that reason, the property rights can be understood as the rights including both formal regulations (enactments and legislatives) and characteristics of their enforcement, as well as social norms and the attitudes of members of a certain community with respect to what constitutes desirable social model [13]. The full effect of the property rights on the economic growth and unihibited market exchange can be expacted only if all the elements of a social context are fully complient with the requirements of a particular property rights regime. Although being obvious, they do not depend only upon the government-run institutional system, but upon the customs, reciprocity and the spontaneous restrictions as well [27, p. 52].

Another specific approach in observing property rights highlights their functional character and economic content at the organizational level. In this regard, property

represents a powerful mean seen as a participation in decision-making proccess or a basis for participating in formulating and enforcement of decisions. Therefore, having the ownership of a resource means that one have his interests defined and protected as a property, which gives him the right to participate in economic decision-making [39, p. 3]. In circumstances of inadequately specificated or poorly implemented rights, the very process (individual or organizational) of decision-making would be burdened with inefficiencies and concequently poor economic performances.

If we emphasize the distributive aspect as a criterion in property rights content analysis, we could say that the property is a substantial indicator for a bundle of relations between the real and the potential income flow, or for different levels of consumption between the holders of the rights and those who are not [40, p. 224]. This is a libertarian and Smithian interpretation of the content and implications of the property rights system, which emphasizes the difference between the real– caused by government activities, and potential– which would be determined by market forces, distribution of particular property rights regime. State influence is not only seen in how clear and in what size the property rights will be defined, but also in additional influence on tax policy or regulatory activities of its organizations [9, p. 44]. For that reason, efficient economic process demands coordination in all the activities governed by the state, so that property rights could be fully protected. In those circumstances is to be expected that exchange and investments achieve high levels.

Judging by the previous analysis of specific dimensions in property rights, though only partially, it is obvious that they exert strong influence on economic efficiency. Regarding pretty complex content and different dimensions of property rights, there are apparently more breaking points through which they could exercise restrictive influence on economic activity.

## 2. SUPREMACY OF PRIVATE PROPERTY RIGHTS FROM INSTITUTIONAL PERSPECTIVE

The question of the relationship of property rights and economic efficiency involves a review of those essential features which make private property rights have significant advantages in stimulating economic activity against alternative forms of ownership. This is particularly evident if we look back to the emergence of private property rights. In fact, only with the change of ownership toward private property has been made a significant step in the development and adaptation of new production methods and means that are used in production. The general conclusion to be reached is that the incentives through which private ownership influences the behavior of economic agents, are the source of the rapid progress in material production, beginning from the Neolithic era period up to modern civilization [25].

Various inducements and their effects on allocative efficiency are the result of social and economic characteristics of property right holders. It is caused by the fact that state and private owners usually react on incentives from various fields. In that sense, according to fundamental characteristics of political system, the state mainly reacts to broader political and social factors, whereas private owners activities are primarily led by market forces [2, p. 22].

Another reason why private property is seen as a superior mode of ownership within the institutional economics consists in the fact that individuals appreciate more carefully

some goods if they are holding it. Private property enables responsible protection and motivates the owner to make it useful, in the most profitable way. Private property is an essential component in market mechanism functioning, because it increases profitability, sale and usefulness of capital usage [23, p. 22].

Within the theory of property rights is the dominant view that an effective system of property rights means that it should have three important features. In fact, what is needed is to be an individual, to be freely transferable and to be exclusive [16; 20; 25]. It seems obvious that, in regards to all the three dimensions (especially to the first and the third), private property represents the preferable pattern in terms of efficiency.

The following cause for transformation toward private property and its predominance in economic system in contemporary economies, refers to the combination of productivity increase, i.e. specialization and social compactness. In relations to that, it can be added that systems based on high level of compactness have lower significance in modern economies, whereas modern economies in relations to its historical alternatives have become far more productive. The causes of higher productivity in contemporary economies are dual in nature. They are based on technological changes and specialization [10]. An especially significant aspect of specialization is its subverting effect on compactness. This makes additional pressure on the efficiency of the system, which is based on collective (political) decision-making.

With regard to the social compactness, it should be noted that this aspect relates to the issue of connectivity or "closeness" that exists among the members of a certain community or a group. Thereat, the familiarity or connection may be biological, but geographic and social as well. If the compactness among them exists, cultural norms are of high significance, interaction among people can be identified, and its effects are well predictable, because all the future and past results of interaction are estimated and visible. For example, a small community, both geographically and by population, whose residents remain most of their life within it, is the environment in which collective decision-making makes sense and could be highly efficient. But in the west economies developed after the medieval era, the production was on a large scale for unknown customers on market transcending a relatively narrow biological, geographical and social entities. This has undermined the efficiency of collective decision-making. Market exchange became responsive to market signals largely coming from personal goals of impersonal economic agents on the market. It had enormous consequences on system efficiency. Systems based on collective decision making, following the principles of non-market resources allocation, would not be capable of solving the problem of efficient resource usage in the same way as the systems that are relying on the prices which are reflecting the objective facts that are commonly known [10, pp. 661- 662].

Organizational complexity, as a special factor flavoring economic system organization predominately based on private property is also connected with specialization. Namely, higher specialization leads to emphasized organizational complexity, whereas coordinate problems, appearing in such conditions, are demanding a system capable of providing continuous coordination of activities in a satisfactory manner. In modern economies, the most adequate system that provides it, is the price system. In order for this system to work, it must have the support of the social and legal structures that are providing trust and support to the enforcement of transactions. Legal institutions, defining private property and dictating the exchange, have to be very operative so that organizational complexity, as intrinsic specialization consequence, could lead to higher productivity [10, p. 664-

665]. Problems in organizational structure, appearing as complexity consequence, can be surpassed in the most adequate manner, within private property right regime, because only within this property regime an adequate functioning of market mechanism and its efficiency can be achieved.

The interaction between distorsion of social compactness, specialization (productivity) and organisational complexity caused essential and very dynamic property transformations at the end of XX century. Specialization has played a prevalent role in this relation. Namely, by decreasing compactness and increasing productivity and organizational complexity, it enabled and caused transformation of contemporary economic systems towards regimes dominantly based on private property. Some authors, for example Demzetz, empasize that specialization promotes development of complex and dependant economy, which in order to be efficient, must be based on a dominant degree of private property over the resources [10, p. 671].

In spite of the fact that the institutions of private property rights are labeled without an atribute „social“, they are very valid and significant in social manner. The reason for their existence is in a good way the result of their convinience in discovering social values and this value judgements are used as basis for formulating possible solutions for the lack of resources. In this context, we could note that even in a hypothetical society where work is observed as a desired activity, and therefore no need for incentives to work exists, it would be necessary to evaluate various alternative outputs which can be produced. This means that it would be needed to precisely and clearly define property rights as prerequisite for efficient resource allocation [11, p. 18].

Finally, it is necessary to emphasize one more argument in favour of private ownership. Namely, if the state activities are directed towards protection and property rights enforcement, at least one party in transaction will be interested to help the state in implementing these rights. In that sense, institutional frame based on regime or predominant regime of private property rights will mainly result in efficinet transactions, because there are no incentives by the state not to respect property rights, and at the same time there is immanent concern of each private party that its activities will be additionally monitored and evaluated by the independent instance in case of abuse. On the other hand, deviations from efficient transactions are more likely if one party in transaction appears from public domain, whereas possible ineffficiecies may be multiple – from asset stripping to infringing the private property rights.

### 3. MAIN MECHANISMS BY WHICH PRIVATE PROPERTY RIGHTS INFLUENCE ECONOMIC GROWTH

Institutional theory emphasizes that availability and productivity of resources is determined by institutional and political characteristics of environment. Although there are certain incompatibilities regarding qualities of the institutions dominantly determining economic efficiency, there is still consensus regarding the fact that property rights have a strong impact on economic growth. Based upon that restrictions in exchange and use of resources should be minimal [21, p. 206].

Property rights, as a theoretic concept, have deep historical roots in philosophy, which is generally the basic characteristic of economic science. Namely, the very concept of economic logics is based on the property contemplation, although in theoretic constructions (especially in economic sense) it has been pretty indirectly considered. Helenic and Medieval philosophers, such as *Aristotel* and *Thomas Aquinas*, emphasized variety of property

characteristics, especially the feature of enabling freedom for the owners. Central function of the property is inspiring people to invest care and effort in the things that are in their ownership. Classical economic philosophers and economists in the XVII and XVIII century, out of which *John Lock* and *Jeremy Bentham* are especially important, were particularly focused on this, according to them, central function of the ownership, and stressed it as the central object in considering the property right matters. They pointed out that individuals would be motivated in making effort, investments and careful management because of ownership. In consequence of this behaviour the ownership will encourage wealth production. This point of view is equal to one of the basic postulates in the property rights theory. It consists of the claim that behavioural patterns of individuals, thanks to the adequatly determined incentives through private ownership, will influence the property rights distribution towards the most productive uses [18, p. 61]. The outcome of such production is not only useful for the individuals, but for the society as a whole.

Contemporary economic theory indicates an additional aspect of property. Due to the fact that the property identifies who owns what, trade is made possibile. In turn, trade encourages specialization by awarding an individual's effort with enlarging its personal ownership, creating something *Smith* regarded as „the wealth of nation" [38, p. 209]. Besides the phylosophical, property rights have deep sociological origins as well. In that sense, according to the premise emphasized by *Max Weber*, ascetical working ethic (so-called „calvinismus"), rational political and social order, reliable (i.e. clear) and transparent ownership system are the necessary and the most signiffcant aspects that should be satistied in order to make development based on capitalistic-market system possible [41, p. 106].

Additional channels of property rights influences on economic efficacy are realised through complicated array of economic and social mechanisms. By creating and stimulating the possibility for saving goods value property rights stimulate responsible behaviour contributing to efficiency enhancement. They increase motivation for the increase in value of goods and through that fact spur the investments. They do not only provide direct incentives for investments, but also the property holders are in position to use the owned object as colateral in the lending process. Finally, property rights extend market size in a way that they enable and motivate a larger number of investors to compete for the ownership of goods [3, p. 105].

Property rights quality, primarilly reflected through the rule of law and property rights protection, influences the efficiency of the economic system in the following ways. On the first level, secure property rights reduce uncertainty, and thus encourage investment activity of companies. On the other hand, property rights a have huge impact on the long-term investments into physical and human capital. If the property rights of investments and its expected returns are perceived as sufficently secure, there is a growth of long term technologically intensive investments in capital with higher additional value. In the opposite case, the economy has to deal with work-intensive, short term investments. If the low transaction costs are present in the economy the tranfer of ownership from less efficient to more efficient economic subjects happens. In this circumstances economic activities based on newly structured property rights structure lead, *ceteris paribus*, to greater motivation for productive behaviour and to the decrease of rent-seeking the problem [14]. In contrast, insecure property rights often lead to inefficient allocation of resources. Uncertainty of the property rights is caused by personal connections of individuals and businesses with the ruling elite and these are used as substitutes for efficient "impersonal" formal rules. The result is that the economic success is determined by personal ties, relative power of

infuence and corruption within the politicized networks. In such conditions, economic efficiency may have a minor role, making the system inefficient in the economic and social way [37, p. 392].

Transactional costs could be observed as a separate mechanism in explaining  the property rights influence on economic efficiency. In that sense, an inefficient property rights system leads to large transaction costs in national economy due to the lack of the valuable characteristics of goods in public domain. As a consequence of inefficient property rights, possibilities for expansion of the labour division and further specialization are limited. This aspect is particularly evident if there are divergent community ideologies, which has a negative reflection on the level of transactional costs, i.e. on the weaker property rights protection. In addition, inefficient property rights, and the related high transaction costs, increase the rent seeking problem.This type of inefficiency is especially obvious in the developing and transition countries [14, pp. 149-150].

*Summa summarum*, if we observe the property rights influence on individual and organisational level, we may say that they speed up exchange and production: they influence in a positive way the decision-making approach to the resources usage; they optimize time horizon; they specify the allowed use of resources; they define transferability and direct the neto benefit and direct appropriation of net benefits [24].

## 4. THE DEPENDENCE OF THE EFFECTIVE PROTECTION AND ENFORCEMENT OF PRIVATE PROPERTY RIGHTS ON THE QUALITY OF POLITICAL INSTITUTIONS

Regarding the fact that in every social system property represents the central connetion between the individual and the state [1, p. 25], the system of political institutions represents an unavoidable element in establishing and providing the efficiency of the property rights system. In order for this to be achieved, the most serious problem the state faces is creating unambiguous property rights. Only such rules could provide maximum freedom to the economic agents when entering into contracts which are in line with their wishes. Once property rights are clear and protected the market process and its indigenous forces of supply and demand get the power to generate high social and economic values [22, p. 116].

The fundamental level in which it is possible to recognize the importance of political institutions is related to the fact that the political rules precede economic. Property rights and individual contracts are specified through the legislative framework and enforced in the process of making political and administrative decisions. However, the problem with establishing the efficient property rights system results in the fact that the structure of economic interests in society influences the political strucure. Considering that, we may say that the state of the given property rights structure and the characteristics of its implementation will be consistent with the specific set of political rules and its implementation [31, p. 48]. However, since the equilibrium does not imply at the same time efficiency. There are two possible solutions. One, although less likely, is the replacement of inefficient political institutions by efficient ones. The other solution is the attempt to modify them in an incremantal or significant way. The reasons for the inefficiency of the economic system come from the fact that political factors impede the institutionalization of property rights in a way that competitive markets can not function effectively [12, p. 200].

Property rights are not an immutable cathegory. They represent an individual's effort in protecting their property, but also an attempt of other economic subjects to take over in

whole or just in part some elements of the others' property rights. Because of this they have to be observed as a function of informal and formal private protection and especially public protection. The efficiency of later primarily depends upon the work of police and courts [5, p. 4]. Without a strong, accountable and committed state, it would not be possible to establish a functional property regime.

Provided that all the instances, starting from the individuals included in exchange over the competitiveness in economic environment till court protection efficiency, funtion in a satisfactory manner, the efficiency of the property rights system would be ensured. However, economic markets, both in the past and present, are imperfect in numerous cases and characterized by high transaction costs. In such conditions, "spontaneous" and efficient property rights distribution is very difficult to achieve which directly reduces the economic potential. The situation is further aggravated by the fact that political markets are even less frequent than economic ones, if they exist at all. The reasons for that are multiple. Voters ignorance, incomplete information, predominat ideologic steretypes (that fortify subjective models, developed by the individuals in order to explain the environment and make choices) could additionally perpetuate inefficiences on political markets. In that case property rights will remain inappropriately protected and enforced [32].

State relevance is especially reflected in the altered circumstances of economic activities, in realtion to the previuos epoches. This is particularly apparent in relation to the changed role and influence of informal institutions. Namely, we could speak about effective property rights protection without formal institutional framework in the previous period, contemporary conditions do not make it possible. The development of the capital markets and large production systems with a large share of fixed costs influenced the evolution of political order, based on force, because more complex impersonal forms of exchange appeared. Personal acquaintances, voluntary restrictions in business and ostracism were not very effective and supportive mechanisms for property rights exchange, as it was the case in the past. However, the benefits which could be realized, if it comes to opportunistic behavior solely based on informal constraints, are sufficiently large in modern economies. This is why formal institutional structure became a necessary mechanism in protecting property rights of individuals and organisations [31].

It is particularly important to point out the complexity of the process of establishing an effective political system and proper functioning of political markets. Namely, mechanisms of measuring and executing transactions on political markets are far less efficient in comparison with those in economic markets. The subject of the exchange between voters and political parties are the promises for votes. In addition, the motivation of voters to be informed is low, because it is not very likely in their perception that their voice, separately observed, is important. Additionally, the whole set of complex influences and interdependances causes always present uncertainty. The mechanism of the implementation of the political agreements is accompanied by a number of difficulties. Competition is far less effective than in economic markets. Regarding the fact that political system is the one that defines and enforces property rights, the logical outcome is that efficient economic markets are certainly not the rule [28].

Another important issue is the specific role and the importance of ideology and the state in maintaining and developing the institutions that particularly determine the domain of ownership. With the growth of exchange between economic agents, it becomes increasingly more specialized and complex. In those circumstances successful contracting requires the support of a third party. Strong political institutions are necessary because

their functioning comprises legal domain. However, states vary widely in the way they define property rights, individuals can see the political institutions more or less legitimate, depending on their ideology. The ideological component is especially significant in the context of an efficient property rights system for the following reasons. Namely, in case of high level of ideological consensus, aspiration towards opportunistic behaviour is minimal. In such conditions, property rights are protected in the best way. In the opposite situation, with low consensus, contract costs would very likely be higher and much larger effort would be needed in transacting. In that sense, ideological consensus might constitute an effective support to formal rules if not, at least partly, substitute for them [17, p. 115].

The relationship between political institutions and property rights is a result of a specific functional relationship that occurs between them. *In concerto,* according to the one of the premises of insitutional theory, there is no unique Pereto-optimal resources allocation, but only the specific results of structure of power or structure of rights. The resource allocation could be specified through a following functional causality.

Widely observed, allocation of resources is the function of offer and demand on the market, whereby the two of the mentioned functions are the function of the *de facto* power. Power is, at the same time, the property rights function. Further derived relation reflects the fact that the property rights are the function of law. Law is the function of legislative and executive authority. Finally, executive and legislative authority are regarded as a function of a competition over the control of the state and its institutions, in order to protect certain interests in relation to the other interests [39, p. 6]. Previous description of multiple, circular and causal relation creates a possibility to notice the difficulty authorities (excutive, legislative, courtal) are faced with, in order to establish an efficient system of property rights protection and enforcement. In societies with merely economic interests, the problem of property rights would be formulated and solved in a relativly simple manner. However, the complex nature of political process and impacts of different interests are those preventing the discovery of rather simple solutions for this issue. The fact which cannot be overlooked is that property rights allocation reflects the structure of power in society.[1] Because of that, negotiations amog the transaction participants are always directed by innitial power distribution. For that very reason, it is necessay that those who establish the formal rules recognize these hazards and model the whole legislative framework in accordance with them.

Having in mind the signifficance of political institutions in context of determining property rights efficiency, we have to identify the general political framework within the efficient property rights protection is possible. In that sense we could assert that democratic policies[2] are a prerequisite for the efficient functioning of decentralized market economies, with clearly defined and implied property rights. This framework is the closest aproximation of adaptively efficient institutional structure. For that reason, it

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[1] There is an interesting interpretation which refers to the distribution of power and its reflections on property structure, especially public ownership. Namely, in some cases there is no reason, in terms of efficiency, for defining property over certain goods as public. However, public property is frequently the result of interest of those who represent authority and those who support it [19, p. 130].

[2] Political regime where property rights are most efficiently protected is the rule of law. Though autocracies may ensure the economic growth in short term, the rule of law is an unavoidable mechanism in long term perpective. [29].

is an essential part of development policy to create those rules which are central for establishing and protecting effective property rights. However, the problem about that is the knowledge imperfectness about how we should create those policies. An additional complicating circumstance is the research in this domain. It is principally concentrated on the USA and the Western market economies. On the other hand, in the places where those needs are most pronounced –in third world countries and former socialist economies, this aspect is insufficiently explored [29, pp. 366-367].

The previuos analysis can be summarized with the constatation that in the regime with positive transaction costs, legal frame becomes one of the main factors in determining economic performances. In the situation characterized by large transaction costs, contracts between the two sides are not likely to occur. In that case the costs are often higher than benefits of different property rights distribution [8, pp. 250-251]. The state, i.e. system of political institutions is doubly responsible in that process. It determines adequate definition of property rights, as well as their consistent and impartial implementation. If this is not the case, the economy will function below the level of production frontiers.

## 6. THE ROLE OF PRIVATE PROPERTY RIGHTS IN ECONOMIC DEVELOPMENT THROUGH HISTORY

It would be wrong to claim that the economic system predominantly based on private property is superior if we take the experiences of socialistic economies and their failure to provide adequate level of efficiency and welfare. The data go much further back in time. Two important civilisations that had left large inheritance to the contemporary world, i.e. The Greek states-cities and the Roman Empire were based on private property. Those were the first two civilisations with institutionally recognized private property, despite the fact that some fragmentary inscriptions indicate the existence of private property forms much earlier [10, p. 667]. Naturally, the existence of private property rights is an insufficient condition for reaching efficiency, and demands certain wider institutional backup. The special role belongs to continuity and stability of the economic and political system. The mentioned features were the crucial characteristics of helenic states and Roman society for a pretty long period of time, not only at the peak of their development.

Historical archive provides a variety of evidence for the claim that property rights need to be adequately protected and enforced. Their influence on economic performances is especially reflected in situations where they are not adequatelly specificated. As an example of harmfullness of unclearly and inadequately defined property rights, we may state the feudal system. For a long period of time this system was not able at all to provide adequate incentives for efficient resource allocation. The reason for that was the manner in which the property rights structure was defined. A blurred system of shared responsibility and with it vague distribution of different aspects of property rights between the monarchs, aristocrats and peasants, generated a tremendous inefficiency and long term stagnation of the economic system. In manorial system (based on the relationship between the servant and the master), country folk, lords and the king had the property over the same land, although their rights were differently defined and often intertwined. In such a complicated system, property responsibilities were obviously ambiguously defined. This had disastrous consequences on economic effciency, not to mention immanent social disasters it invokes. Only with their radical redifinition and greater specification in terms of rights to

use, transfer or exclude others from use, came to their complete contribution to economic development, especially during the Industrial revolution.

The specificity of the property rights system does not only reflect the necessity to be established gradually in time, but also significant time is needed until it begins to produce a full effect on economic activity. Medieval development of England distinctly confirms the fact that it takes a long period of time to establish an efficient system of private property protection. Namely, the appearance of *Magna Carta*[3] in 1215 caused a relatively secure protection of property rights. This was especially the truth for those times. However, it took additional four centuries for it to reach political verification and more solid legal basis, which occurred with the Parlamentarism triumph in 1689. Unlike that, the political voluntarism and pretty insecure political and legal environment often ended with expropriation of property rights by the monarch, especially over financial resources. *Magna Carta* established institutional basis that produced political democracy and conditions for long term economic growth. This form was later reproduced and extended, with certain modifications, in British colonies in North America [19, p. 130].

Another ilustrative historical example, representing the great role of private property, refers to the USA. Namely, one of the highest USA achievements, in the early period of development, was adopting the special law in May, 1875. The law strongly promoted private property rights and this was of indispensable signifficance for further USA development [36, p. 147]. Although being suplemented and adapted several times during XX century, it has basically remained the same for a long period. From the present point of view, evolution and adaption of the above mentioned institutions will last for two centuries, but it is exactly they that made USA economic system superior in technological and economic manner during the whole XX century. Contrary to the experience with private property rights in the USA, there was strong opposition to property rights allocation toward private ownership in the late Middle Ages in France and Spain, which caused slower economic growth in these countries [24, p. 234].

Besides the hesitations or impossibility for adquate property rights definition, various historical experiences distinctly indicate the destructive consequences of violating the established property rights. The very representative example is the confiscation of property rights that took place in France in the XIV century. Namely, starting from 1307 onwards *Philip IV* significantly assessed tax on the means of the knights templares (*Ordre du Temple*), in order to solve seriuos financial problems. Five years later, pope *Clement V,* exposed to high pressure from the French king, was obliged to dissolve the order and tranfer part of the money to Maltesian knights. The influence of these measures on the economy was very signifficant for this time, since these knights established the first known international bank system. It was based on strong military relations between the members of the order [6, p. 4560]. This kind of expropriation, like the future violations of property rules, caused stagnation in financial system development in France in comparation to the other European economies, especially the Dutch. If there is unequivocal,

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[3] It is interesting to say that *Magna Carta* was actually bought. Namely, the parliament rights to enact the laws, to investigate the cases of abuse and advise in national politics domain were practically bought from *Edward I and Edward III.* This money was borrowed to them so they could more easily wage the Hundred Years' War. New military technologies consisting of crossbow, bow and arrow, spear and gunpowder highly increased the war expenses. As a result, the British monarchs were obliged to change certain legislative rules, so they could have sufficent money to finance the war. Thereat, their throne depended on the outcome of the war. [19].

empirically and theoretically confirmed connection between the financial system and economic growth, consequences in terms of missed opportunities can be gleaned.

As a contemporary example that is often cited in terms of contrary conclusions to the assertation of the new institutional economics and property rights theory, i.e. their emphasise on the importance of private property rights, some authors cite the experiences of China. The reason for this consists in highlighting the fact that this country has specific ownership structure of the land resources, but also a significant number of companies in the non-private ownership regime. However, China's experience may be observed as additional argument or an excellent example, favouring the property rights theory and private property structure of economy. Namely, at the end of the 1970s, when the process of strong economic growth started, fundamenatal changes occurred in the institutional structure of Chinese economy. It provided individual instead of collective agricultural land cultivation, whereas economic subjects were given a possibility to make dicentralized instead of centralized decisions about resource allocation [42, p. 49]. It is obvious that this kind of institutional changes influenced the fundamental *de facto* change in the property rights system and basis changes in incentives, regardless of *de jure* property status of land or economic organisations. Besides that, new tendencies in Chinese economy confirm the fact that *de jure* property structure changes towards the dominant private property. To demontrate this, in 2000 around 80% of public and state companies in provincies and cities were privatized, whereas the rest were open to variuous cooperative relations with the private sector [43, p. 242]. The difficulties in the financial system were probably an additional factor that pushed privatization further. Namely, the amount of non-performing loans (NPL) in China represented huge burden for future economic growth. Although this phenomena is still present in Chinese economy and creates signifficant risks for the stability of the whole economy, privatization reduced the possible colapse of the financial system.

## 7. CONCLUSION

In the paper are presented the basic dimensions and mechanisms through which the property rights influence the efficiency of national economy. The conclusion could be summed up noting that the growth and development of the economic system are required as a necessary condition for clear determination and consistent enforcement of private property rights. Regarding the multiple aspects of establishing an effective and efficient property rights system, there is a decisive need to coordinate other institutional segments and public policies with those in property sphere. This includes especially the observation and investigation of the distribuitive, legal and wider institutional dependances.

The advantages of the private property rights, regarding efficiency, are based on historical factors of social and economic system development, referring to the decrease of social compactness, increase of specialisation and higher organisational complexity. Besides that, other inherent characteristics of private property rights– in first line providing appropriate incentives for economic agents, are in the center of understanding all of the other growth factors, such as entrepreneurship or technical innovations.

Efficient property rights enable and stimulate trade, which influences market expasion and the volume of investments. Trade and market expansion influence further division of labour and specialisation, which increases productivity and through that higher rate of economic growth and wealth creation. On the other hand, clearly defined property relations

and a stable institutional system reduce transaction costs, which increases transaction scope. Thanks to private property rights strong material incentives and a freedom of economic agents are provided. These are prerequisites for the increase of investments.

An efficient property rights system is more the exception than the rule. The sources of such a state in this domain have to be explained. Most of them come from the political system. Inefficiencies are primarily the consequence of different principles prevailing in political and economical spheres. It refers, beside other things, to the complexity of the aims by political actors and simplificity of goals by economic agents. Political institutions based on the rule of the law are *conditio sine qua non* of the efficient market economy and its undisputable growth and development.

The analysis of the variouos historical experiences confirms practical signifficance of property rights in the development of certain countries. The growth and high economic performance of the USA and the UK in the last century and a half could be largely interpreted as the consequence of the established private property rights system. The failures of France and Spain to establish credible public obligations of private property protection undoubtedly influenced relative stagnation of these systems. Flexibility and continuous development of contemorary Chinese economy, in terms of structure and property rights enforcement and protection, represent the pivotal part of the explanation of its economic progress in the last forty years.

The work also represents a solid basis for future research in several ways. There is a necessity for more complete comprehension and analysis of the influences from political sphere. Through empirical evaluation and analysis of the property rights influences, more detailed explanations about the relative power of mechanims effecting economic efficiency could be provided. Finally, studying the specific historical experiences in a large number of countries, uncovered by existing research, opens the possibility for explaining why and how weak property rights determine the stagnation of some countries in the long term.

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# KONCEPTUALNI OKVIR ZA RAZUMEVANJE UTICAJA EFIKASNE ZAŠTITE PRIVATNIH VLASNIČKIH PRAVA NA EKONOMSKU EFIKASNOST

*Vlasnička prava predstavljaju jednu od najznačajnijih strukturnih determinanti efikasnosti ekonomskog sistema. S obzirom da sadržinom zadiru u ukupnu institucionalnu, pravnu i distributivnu sferu, njihov uticaj na ekonomske performanse u nacionalnoj ekonomji je kompleksan i veliki. Specifična svojstva povezana sa socijalnim i ekonomskim karakteristikama nosilaca prava, generisanjem adekvatnijih podsticaja, potpunijim vrednovanjem, kao i individualnost, ekskluzivnost i slobodna transferabilnost, kombinovano dejstvo specijalizacije, produktivnosti, socijalne kompaktnosti i organizacione kompleksnosti, učinili su da privatna vlasnička prava generišu značajan ekonomski potencijal. Mehanizmi putem kojih se to ostvaruje se odnose na omogućavanje trgovine, povećanje obima tržišta i konkurencije, redukciju transakcionih troškova i obezbeđivanje adekvatne motivacije kod ekonomskih agenata. Nesavršenosti političkog procesa i iz njega rezultirajućih političkih institucija predstavljaju glavne uzroke neefikasne zaštite i sprovođenja vlasničkih prava. Specifična istorijska iskustva u razvoju pojedinih nacionalnih ekonomija na upečatljiv način potvrđuju njihova nesumljiva svojstva koja stimulišu propulzivnost nacionalne ekonomije i obezbeđuju pretpostavke dinamične ekonomske aktivnosti.*

Ključne reči:  *vlasnička prava, formalne institucije, ekonomska efikasnost, političke institucije, ekonomska istorija.*

# ANALYSIS OF SERBIAN INNOVATION POTENTIAL IN THE PERIOD 2009-2012

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**Abstract**. *In this paper a review of significance of country's innovation potential for its economic growth and development is displayed first. Afterwards, positions and values of the global innovation index for the top 25 most innovative economies, for Serbia and for selected countries from its surroundings, for the period from 2009 to 2012 have been displayed. In order to classify selected countries into two or more groups, based on their similarity according to innovation performances, cluster analysis is conducted. The relations between innovation inputs and innovation outputs have been studied on the example of selected groups of countries (the group of European innovative leaders and Serbia with neighboring countries) through the correlation analysis.*

**Key Words**: *innovation, innovation inputs, innovation outputs, innovation efficiency.*

## INTRODUCTORY NOTES

A larger share of new products, services and processes is one of the key assumptions of generating economic growth and improving competitiveness of the country, regardless of the level of its economic development. Growth in innovation potential, on one hand and improving its competitiveness, on the other hand, is the long term requirement for economic and social progress of all countries regardless of the level of economic development (Cvetanovic, Mladenovic, Nikolic, 2011).

The score of the achieved level of innovation of countries is based on a larger number of data. This study used data from the Global Innovation Index Report 2011, 2012.

The objectives of this research are: a) an explication of the most important theoretical basis on which the concept of innovation potential of the national economy rests, b) review of the metrics of the innovative potential of the economy - Global Innovation Index, c) an empirical analysis of the level and dynamics of the improvement of innovation potential in the economy of Serbia in comparison to 25 most innovative economies in the world and to its surrounding countries in 2009-2012 period.

For an explanation of the main pillars for the concept of innovation potential of the economy, as well as to reflect on the Global Innovation Index metrics in addition to the descriptive approach, graphics explication of the phenomena studied was used. On the other hand, as dominant analytical tools for empirical analysis of the achieved levels and dynamics to improve the innovative potential of selected countries, quantitative tools of correlations and cluster analysis were used.

## 1. THEORETICAL FUNDAMETALS FOR CONCEPT OF INNOVATION POTENTIAL OF THE ECONOMY

The explication of the supporting theoretical pillars of the concept of the innovation potential of the economy is not an easy task. It is our opinion that it is not possible to understand the importance of innovation potential for the development of modern economy properly without understanding the messages of three teachings that occupy a significant place in the development of economic science and designing of economic policies of advanced countries over the last twenty or more years. That being said, we have in mind: a) the emergence of new theories or endogenous development, whose holdings are represented by endogenous growth models of Paul Romer (Romer, 1986, 1987, 1990), b) recognition of the concept of national innovation system by Christopher Freemen (Freeman, 1987) and c) learning about creating competitive advantage of nations by Michael Porter (Porter, 1990). The unifying thread of these three teachings, which is defined in the context of the title of this work, the highest possible analytical importance has the position in which the improving innovation of the economy is at the epicenter of explanation of the physiology of macroeconomic phenomena such as the economic growth and the competitiveness of countries (Cvetanovic & Sredojevic, 2012).

Endogenous growth explanations emphasize the existence of positive correlation between the dynamics of the improvement in innovation potential of the country and the quality of the country's key macroeconomic performances. Also, it founds incentives for innovation in the appropriate institutional arrangements as the innovators are not able to realize the benefits of their results in an unfavorable institutional environment, which inhibits the growth of its innovative potential (Jones, 1998).

Endogenous growth (Romer, 1994) theory has not yet become a full conceptual approach to research key factors in the economic prosperity of individual countries. For its creation and promotion we credit a number of economic theorists. Consciously risking going into unjustified neglect of contribution of a large number of researchers to the explanation of complex mechanisms for generating growth, in this paper, a new theory of growth is associated with model presentation for the growth of the American Nobel laureate Paul Romer from the period 1986 -1990 (Romer, 1986, 1987, 1990). In addition, Romer's theoretical opus about the key drivers of economic growth is divided into two parts; endogenous growth models based on externalities (Romer, 1986, 1987) and growth models, the basis of which are research and development activities (Romer, 1990).

Growth models based on externalities (Jones, 1995) start from the premise by which innovation in the broadest context of the economy as a whole allow expression of increasing returns, which is completely contrary to the assumption of perfect competition (Romer, 1986). In the absence of perfect competition, knowledge cannot be perfectly protected with patent or trade secret. The knowledge that each individual company creates by "learning by doing" becomes instantly available and free to all interested parties for their use. So the company can see that it "leaks" new knowledge, but it has benefited from the knowledge that "leaks" to others. This means that at time t there is same level of knowledge for all firms, i.e. the same for the whole economy. This level can be represented by the equation: At = cKt b, for b> 0, where At is the level of technology (innovation potential of the economy), Kt capital (physical) b the elasticity of At for the change in Kt, and c is a constant. The equation At =cKt b indicates that the level of technology (innovation potential size of the economy) depends on the accumulation of capital at time t. Thus, the total stock of knowledge j is an increasing function of investment and determined by the actions of economic agents, which makes a complex of technological change endogenous. Since the companies are unaware of the production of knowledge, it is always considered that the level of technology At as a given size and, at the same time, a factor which can be used at no additional cost (Valdés, 1999).

Previous explicit model was not entirely satisfactory, primarily because of the circumstances that the complex technology (innovation) in the treatment of it was accidental result of the economic activities of the company (Sener & Sarıdogan, 2011). Specifically, in it the companies maximize profits, investing in capital by process of learning by doing and knowledge spillover effects (Cohen & Levinthal, 1990), increasing the general level of knowledge regardless of the fact there is no explicit intention to do it. However, in real life, the facts are that the new knowledge is in the minimum percentage the result of accidental activities, while it is dominantly a result of work of companies who deal with innovation activities in an organized way, while trying to realize monopoly rents (McElroy, 2003; Teece, 2003). Thus, the implicit assumption by which new knowledge is available to everyone for free, as well as the assumption according to which there is perfect competition; make the largest structural defects of this model. Romer associated improvement in the innovation potential of the national economy with an undeniable need for innovators to use commercial valuation of their solutions in order to make profit (Romer, 1986).

Growth in Romer's model is based on research and development and driven by innovation, and results from investment decisions of companies that maximize profits (Romer, 1990, 1994). Romer recognizes that the technology is different from all other goods, because it is uncompetitive in nature and only partially exclusive good. A good level of competitiveness of any good is exclusively its technological feature. Competitively good is used by one company or one person which understandably means it is not to be used by anyone else. In contrast, non-competitive good is available to all without any restrictions. Unlike competitive features, exclusivity of a good is a function of both technology and the legal system. Good is considered exclusive, when its owner can prevent others from using it. Conventional economic goods are distinguished by features of competitiveness and exclusion. Public goods are uncompetitive and non-exclusive. Precisely because they are non-exclusive, the supply of public goods cannot provide security to private individuals, and they cannot be traded in the market. For the theory of growth there is an interesting group of goods that are not competitive, but also partially exclusive, and technology is such kind of good. There are three basic assumptions on which Romer build his model

based on the importance of research and development activities in 1990: a) technological change (innovation) is a key determinant of economic growth, b) innovations are mainly the result of deliberate actions taken by individuals to respond to market incentives and, finally, innovations are by their characteristics different from other economic goods. These three assumptions directly lead to the conclusion that the equilibrium is not possible in conditions of perfect competition, but there must be a monopolistic competition. In fact, if all inputs were paid according to marginal product, the company would have losses arising from the additional expenses associated with previous investments in research and development of new products or new processes. In the model of economic growth of Roberta Solow this problem is abstracted due to the fact that the complex technological change (innovation) is treated as an exogenous character variable (Solow, 1956). However, this model is consistent with the premise on which technological change (innovation) is a key determinant of economic growth and at the same time it is a non-competitive good. However, the model is not consistent with the real fact that technology is the result of planned and organized activities of economic actors to maximize cash benefits.

National innovation system comprises of a network of public and private institutions whose activities and interactions determine the emergence, import, continuous improvement, and the general diffusion of new technologies (Freeman & Soete, 1997). The concept connects institutions and determinants of quality of innovation processes in the country (Etzkowitz, et al., 1998). The attribute "national" includes many categories in which the state has a certain impact. In short, the national innovation system is the totality of relationships between organizations and relations involved in the production and diffusion of scientific and technological knowledge (innovation) in the manufacturing process and the society at large is the territory bounded by national borders (Freeman, 2002; Lundvall et al., 2002). In the simplest form, the national innovation system model describes the mutual relationship of the elements of which it is composed, the private sector, whose role is reflected in the use of technologies developed as a result of its own research, market winning of innovations, support of the country in the creation of new theoretical and applied knowledge as well as the creation of infrastructure and institutional conditions conducive to the development of innovation activities in private companies. In a word, the national innovation system should be understood as form of an organization of economy and society, which, in conditions of turbulent changes in the environment, ensures sustainable development of the national economy (Peters, 2006).

The idea of the concept of national innovation systems in rudimentary form can be found in the works of German economist Friedrich List (Peters, 2006). List identified a number of significant determinants of investment such as industrial production, institutions, import foreign technology, education and training. List's main concern was, as some of the authors say, how Germany can overcome its economic backwardness in relation to England, which was then the world's leading industrial nation, and how the economy will catch up and surpass England (Freeman & Soete, 1997). As a reminder, the paper argued for the protection of young industries and appropriateness of the policies able to accelerate and facilitate the industrialization and economic growth. Most of these policies were concerned with teachings about innovation and economic effects of their specific application. The most important characteristic of this strategy was its devotion to the proactive role of the state. List realized the importance of understanding the interdependence of innovation and economic development, concluding that in order to improve the innovation potential of Germany, the government should outline and implement a

long-term policy support for the development of science, technology and industrial production.

There are large differences in innovation potentials of the countries that have similar production resources in the standard sense of the word, which again has to do with the key performance of their national innovation systems (LeBel, 2008). Talking about innovation in this light, there is a regard to the use and continuous improvement of existing solutions, as well as the intense process of gaining new knowledge. In both cases, primarily referring to the knowledge that exists within and outside the company, but as far as this other form; we have in mind the knowledge that exists in the country in which the company operates.

A number of authors believe that the concept of national innovation systems primarily emphasizes the importance of tacit knowledge in generating technological innovations (Simoneti, 2001). Otherwise, under the assumption that knowledge is codified explicitly and unambiguously, the company could simply buy it like any other factor of production. However, tacit knowledge means that the company must maintain numerous contacts with other firms, as well as with a number of different organizations in order to gain access to knowledge and especially to make it effective in use.

National innovation systems are formed under the influence of many different factors for each of the analyzed countries, including its size, the availability of natural and human resources, the characteristics of the historical development of public institutions and the dominant forms of entrepreneurial activity (Figure 1). These factors determine to a significant degree the level and dynamics of the innovative potential of improving the national economy (Smith, 2010).
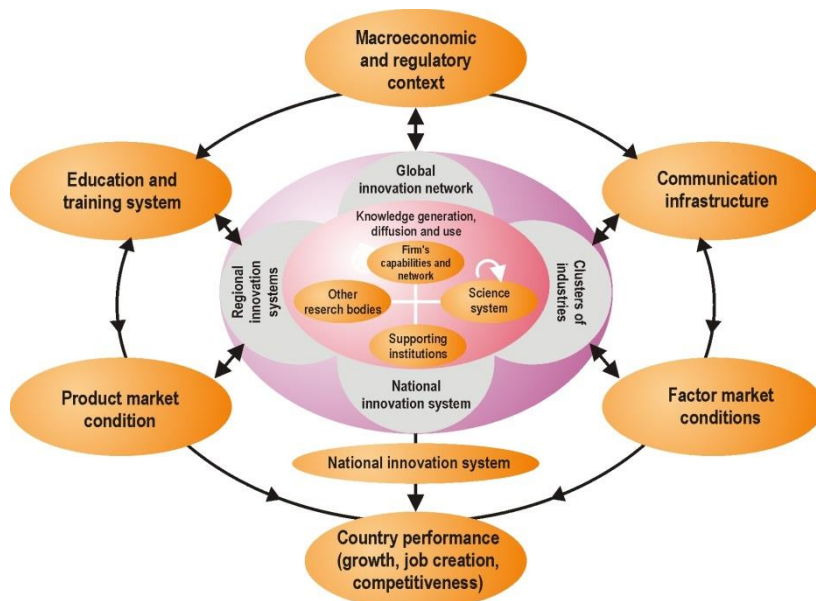


**Fig. 1** National innovation system
   Source: Modified according to (OECD, Managing National Systems of Innovation, 1999)

Michael Porter's key determination is that innovations initiate and support competition. The main determinants of competitiveness of individual countries are:

a) conditions relating to the factors that determine the dynamics of production and forms of manifestation profiling the competitive struggle in certain areas of business (capital, level of technology, infrastructure, skilled workforce, available information, etc), b) Conditions related to internal demand for goods and/or services of given production areas, c) the presence of related competitive industries in the country and d) conditions in the country that determine how the company is set up, organized and lead, as well as the nature of domestic competition (Porter, 1990).
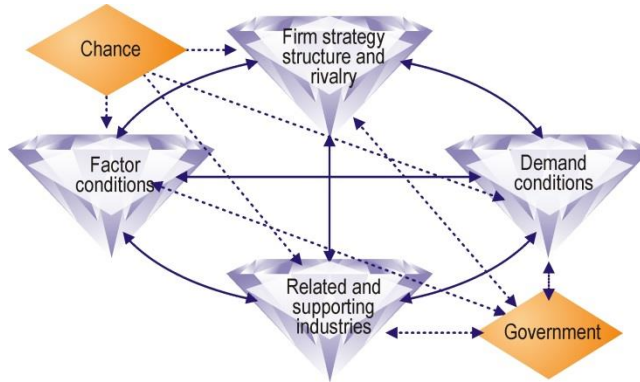


**Fig. 2** Porter's diamond of national competitiveness
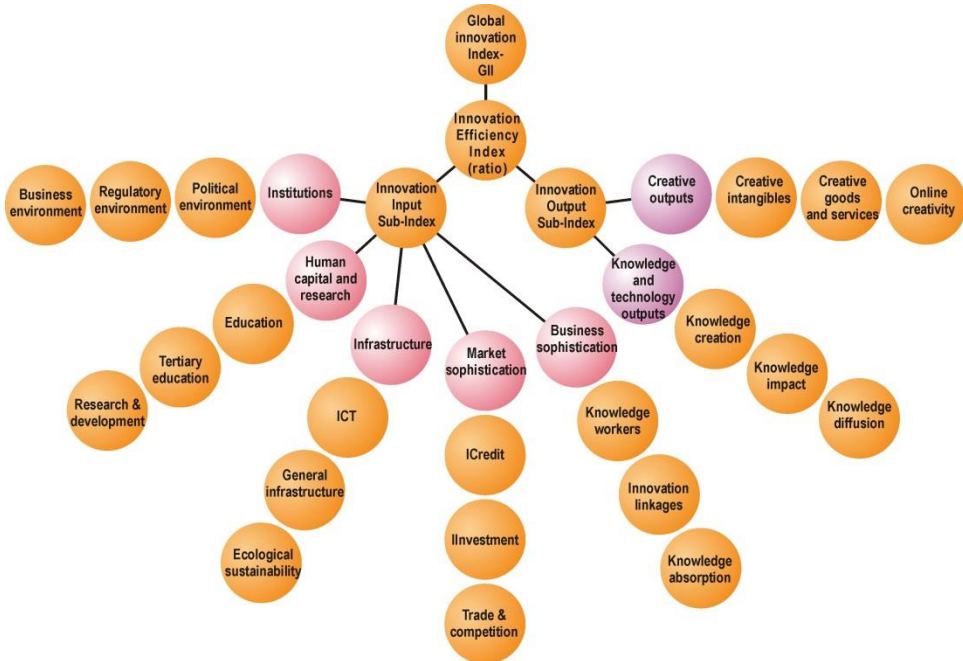Source: Modified according to (Porter, 1990)

In the view of Porter, the success is achieved by those countries in which the process of interaction of all the factors of national competitive advantage is most dynamic. Significant improvement of innovation in the economy is not possible, if one of these determinants of the diamond of national competitiveness does not make its full contribution.

## 2. METRICS OF GLOBAL INNOVATION INDEX

In this paper, innovativeness of the economy is quantified based on data from Global Innovation Index (2011, 2012).

Global Innovation Index is based on two sub-indices: Innovation inputs and Innovation outputs. Innovation inputs consist of five pillars that display elements, i.e. potentials for innovative activities of national economy: (1) Institutions, (2) Human capacity, (3) Infrastructure (4) Market sophistication, and (5) Business sophistication. Innovation outputs consist of two pillars that show the actual results of innovation: (6) Scientific outputs and (7) Creative outputs. Each pillar is divided into sub pillars and each sub-pillar consists of individual indicators (see Figure 3).

Using the model shown in Figure 3, the country will be measured in accordance with its Innovation inputs and outputs, which together determine the overall value of GII and place the country on a ranking list made under the criteria of innovation.

**Fig. 3** Metrics of Global Innovation Index
Source: Modified according to (The Global Innovation Index, 2012)

Input parameters determine benefits of the environment in which economic actors operate to create and effectively use various types of innovation in the economy. Outputs are the results of the proof of innovation inputs: patents, trademarks, copyrights, creative products, workers in the areas of knowledge-based services, the share of exports of high-tech products in total exports, etc.

## 3. INNOVATION LEADERS, SERBIA AND NEIGHBORING COUNTRIES

Figure 4 shows place in the rankings according to the criteria of innovation in the period 2009-2012 (top 25 most innovative economies in the world).

Figure 5 shows place in the rankings according to the criteria of innovation in the period 2009-2012 (Serbia and selected countries in Europe).

There has been a major qualitative shift for Serbia in the criterion of Global Innovation Index in 2012 compared to previous years. In fact, from 101st place in 2010 (and 92nd place in 2009) Serbia was ranked 46th according to this criterion in 2012, surpassing Greece, a long-time member of the European Union. However, even under the condition that there is no doubt about the statistics incompatibility in the data on the basis of which the Global Innovation Index is composed, the fact is that the surrounding countries, Hungary, Slovenia, Bulgaria, Croatia, are significantly ahead of Serbia according to the criterion of Global Innovation Index in 2012. From the countries bordering Serbia only Bosnia and Herzegovina and Macedonia are behind it in the Global Innovation Index (Cvetanovic, Despotovic, Nedic, 2012).
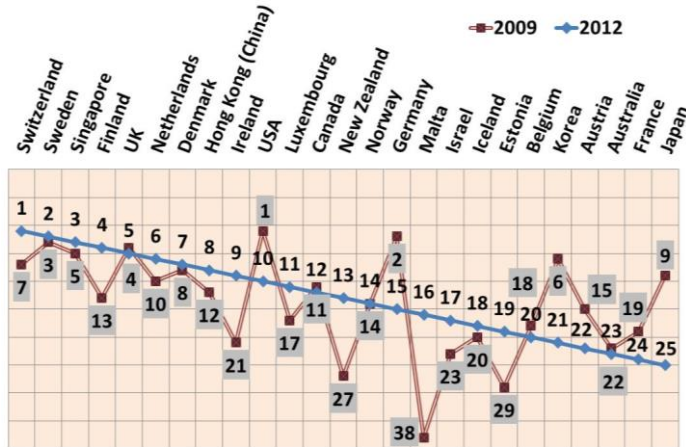
**Fig. 4** Rankings of the top 25 most innovative economies in the world
Source: The diagram is based on the database from (The Global Innovation Index, 2011, 2012).
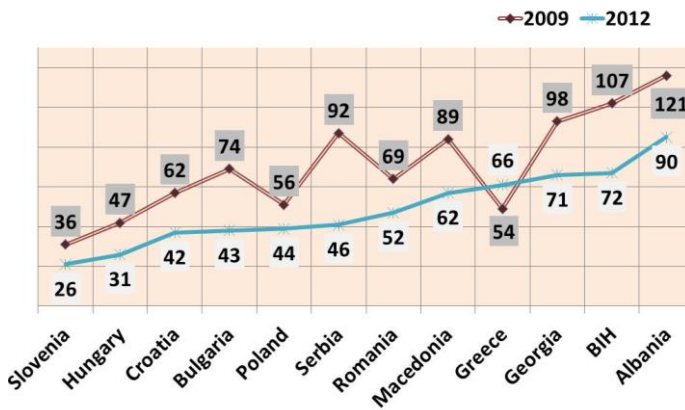


**Fig 5.** Rankings of Serbia and selected countries
Source: The diagram is based on the database from (The Global Innovation Index, 2011, 2012)

The question timely arises as to what extent innovation input size determines the value of innovation output. Depending on the answer to such a question we can provide useful information to policymakers in which direction it is most appropriate to work on incentives and other government measures to improve innovation of the economy. In order to get the answer to the question of dependencies in values that make innovation inputs and innovation output components, we will use the statistical analysis of a very well known, so called XY diagram. This is a common way to show the connection (direction and degree of quantitative variation agreement) between two variables.

Figure 6 shows the scatter diagram of the relationship between the variables of Innovation inputs and outputs.
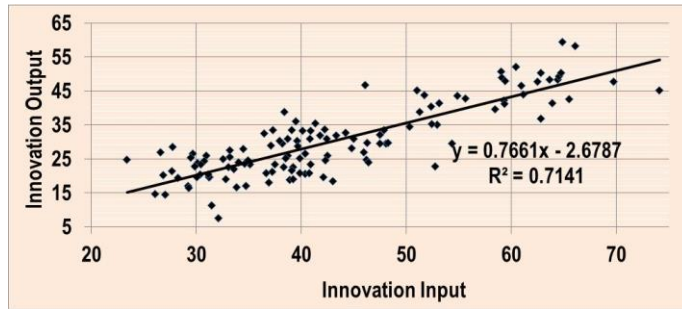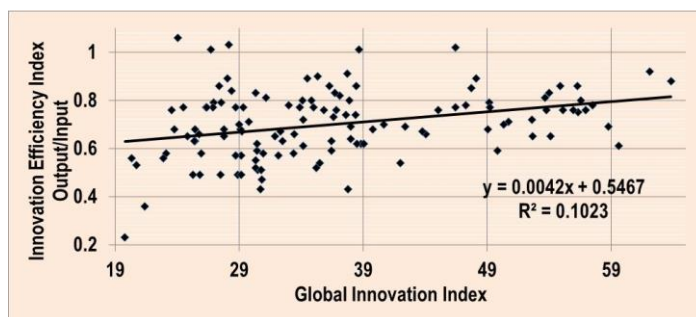
**Fig. 6** Scatter diagram for the relationship of Innovation Input and Innovation Output
(data on a sample of 125 countries, in 2011)
Source: The diagram is based on the database from (The Global Innovation Index, 2011, 2012)

A graphical representation of data pairs of **innovation inputs** and **innovation outputs** shows a strong correlation between the variations of the observed variables. Customizing the linear form of interdependence and analysis of components in the specified model also suggests previously stated, perceived visual statement. In fact, linear regression function has the following form: y = - 2.678 + 0.766 X, with statistics of $R^2 = 0.714$ and R = 0.845. The value of the coefficient of determination indicates the presence of 71.4% variation in variable **innovation output** is explained by variations in **innovation inputs,** while the remaining 28.6% is a result of the influence of other factors not included in this model. Strong correlation is confirmed by the correlation coefficient 0.845. Testing the hypothesis of linear interdependence of variables over the corresponding regression coefficient obtains the value of the test statistics at 17.527. With probability 0.05 level of significance of the test and the test threshold at 1.9794, we also conclude that there is a statistically significant linear correlation between the variables of **innovation inputs** and **innovation outputs.**

Figure 7 scatter diagram shows the relationship between the variables of Global Innovation Index and Innovation Efficiency Index.



**Fig. 7** Scatter diagram for the relationship of Global Innovation Index and Innovation efficiency index (data on a sample of 125 countries, in 2011)
Source: The diagram is based on the database from (The Global Innovation Index, 2011, 2012)

A graphical representation of data pairs for the **Global Innovation Index** and **Innovation Efficiency Index** shows a very weak correlation between the variations of the

observed variables. Customizing the linear form of interdependence and analysis of components in the specified model also suggests previously stated, perceived visual statement. In fact, linear regression function has the following form: y = 0.546 +0.004 X, with statistics of R $^2$ = 0.102 and R = 0.319.The value of the coefficient of determination indicates that *only* 10.2% of the variation in variable **Innovation efficiency index** is explained by variations of the **Global Innovation Index,** while the remaining 89.8% is a result of the influence of other factors not included in this model. Weak correlation is confirmed by the correlation coefficient 0.319. Testing the hypothesis of linear interdependence of variables through appropriate regression coefficient obtains value of the test statistics at 3.237. With probability level of significance of the test at 0.05 and the test threshold at 1.9794, we also conclude that there is a statistically significant linear correlation between the variables **Global Innovation Index** and **Innovation Efficiency Index.**
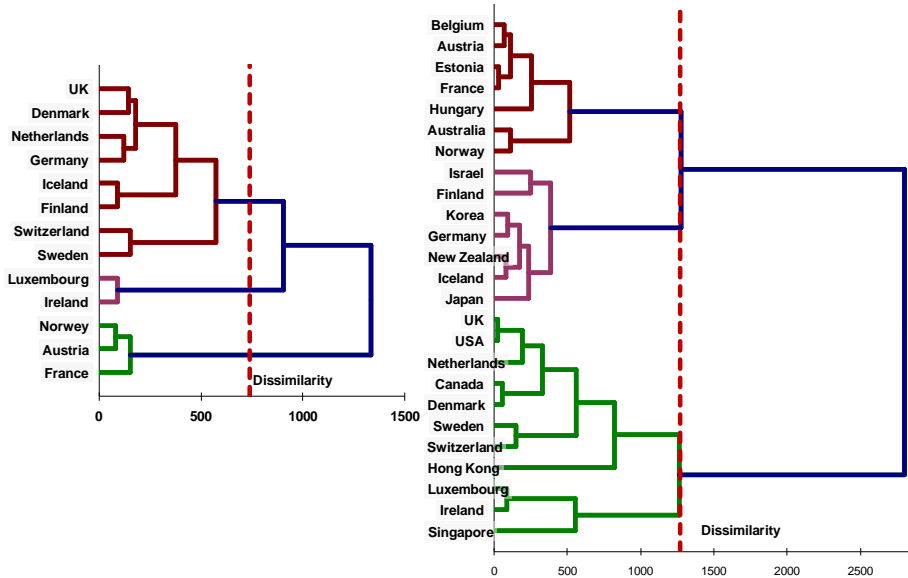
## 4. CLUSTER ANALYSIS

By cluster analysis, the observed set of elements is divided into subsets, so that the elements that are similar in some sense are grouped in the same cluster. In this case the method used was agglomerative hierarchical clustering.

Figure 8 shows the dendrogram of the cluster analysis conducted between clusters for which we used data for the Global Innovation Index, innovation index of efficiency, input and output sub-index with the corresponding pillars of The Global Innovation Index 2012. X axis gives the diversity level between the countries analyzed.

In the process of grouping selected European innovation leaders according to the degree of efficiency innovative bottom-up agglomerative hierarchical clustering method was used. In the initial step, each country is treated as a separate cluster. Their merging in pairs of clusters is based on the similarity in terms of the observed values of the variables which is the result of all subsequent clustering iterations until all observed entities are consolidated within one cluster. If we take diversity level of 600 as a possible cross-section in dendrogram, three clusters of the observed countries are clearly identified. The largest group consists of 8 countries, or 53% of the total number of observed countries. The second group includes Norway, Austria and France. The third group relates to Luxembourg and Ireland.

If we consider the world's innovation leader and take the cross section at diversity level of 1250, it is possible to clearly identify two dominant clusters in the presented dendrogram. A striking feature of the first cluster is that its two sub cluster elements are created at a much higher level of diversity than is the case with countries that belong to another cluster. The countries included in the cluster are characterized by a much higher degree of variations in level of innovation effectiveness than is the case with countries within the other cluster. Also, in comparison with clusters that are formed for European leaders, the grouping for the world's leaders in clearly segregated clusters was achieved at a much higher level of diversity, which suggests the expressive degree of variability in the innovative effectiveness worldwide.

Figure 9 shows the dendrogram of the cluster analysis implemented for Serbia and selected group of 11 European countries, the diversity is given on the Y axis. Diversity is determined on the basis of data for GII, sub-indices of *innovation inputs and innovation outputs* and the corresponding pillars.

**Fig. 8** The dendrogram of the cluster analysis conducted for the European and global innovation leaders
Source: The diagram is based on the database from (The Global Innovation Index, 2012)
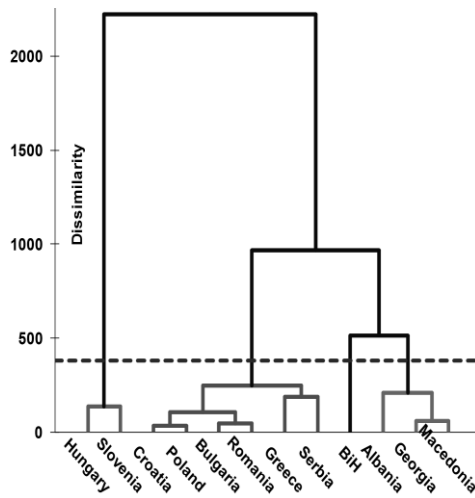


**Fig. 9** Dendrogram of the cluster analysis implemented for Serbia and selected group of countries
Source: The diagram is based on the database from (The Global Innovation Index, 2012)

Cluster analysis applied to Serbia and a selected group of countries follows a similar trend for grouping as countries in the category of European innovation leaders. On the dendrogram presented, it can be seen that from the innovative aspect of the degree of efficiency, at the first

level of grouping, Serbia is most similar to Greece and then to Croatia, Poland, Bulgaria and Romania. On the other hand, there is the biggest difference compared to Hungary and Slovenia. Overall, at the diversity level of 900 we can identify two clusters, i.e. Hungary and Slovenia on one side against all other countries covered by the analysis.

## 5. COMPARATIVE ANALYSIS OF INNOVATION FOR SERBIA AND NEIGHBORING COUNTRIES IN 2012

In Figure 10 in the given diagrams, we analyzed Serbia's position in relation to the surrounding by GII and sub-indices of GII.
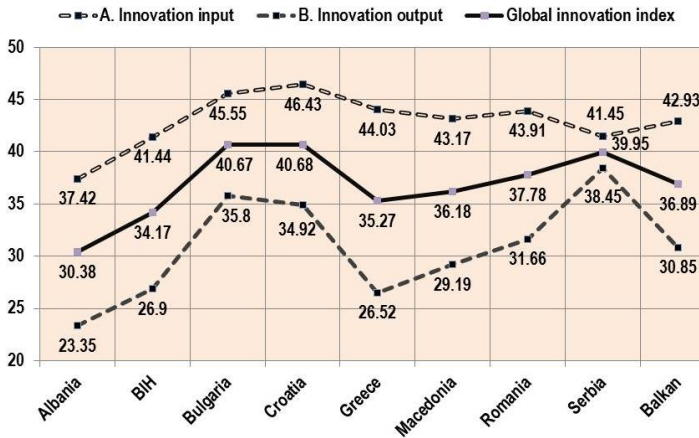


**Fig. 10** Innovation Input Sub-Index, Innovation Output Sub-Index and Global Innovation Index, Serbia and neighbors

In order to obtain a more realistic picture of the relationship between innovation inputs and outputs we will investigate the correlation.

Graphical representation of data pairs of variables Innovation input and Innovation output for the selected group of countries indicates a weak (negligible) correlation among the variations of the observed variables.
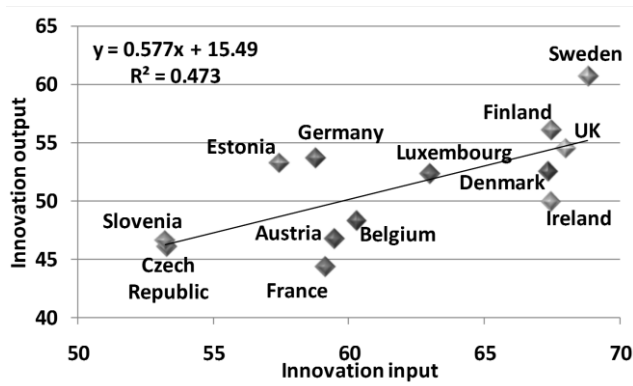
Adaptation of the linear form of correlation and analysis of specified model components also suggests previously stated, visually perceived statement. In fact, the function of the linear regression has the following form: $y = -14.3 + 1.048 * x$, with the statistics $R2 = 0.319$ and $R = 0.565$. Value of determination coefficient shows that 31.9 % of total variations of Innovation output variable is explained by the variations of Innovation input variable, while the remaining 68.1% represents the result of the influence of the other factors which are not included in this model. A weak correlation is also confirmed by the correlation coefficient 0.565. Its value indicates the existence of low grade, direct (straight line extending from the lower left to upper right corner of a graph) linear correlation among the observed variables in countries included in the sample. The slope of the line $b1 = 1.048$ indicates that the growth of Innovation input variable for one unit of its measurement leads to growth of Innovation output for 1.048. Testing of the hypothesis of linear independence of observed variables over the

corresponding regression coefficient gave the value of the statistics test of 1.6788. With a probability level of significance of the test 0.05 and test threshold 2.4469, it can also be concluded that there is no statistically significant linear correlation between the observed variables Innovation input and Innovation output.
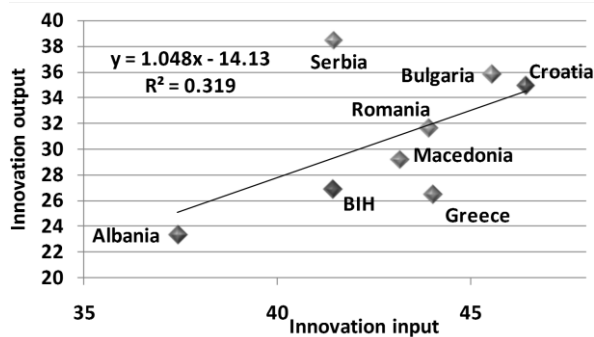


**Fig. 11** Scatter diagram for the connection between global innovation index and innovation efficiency index (data on a sample of eight countries)



**Fig. 12** Scatter diagram for the connection between global innovation index and innovation efficiency (data on a sample of thirteen EU countries)

Graphical representation of data pairs of variables *Innovation input* and *Innovation output* for the selected group of countries indicates a potentially significant correlation among the variations of the observed variables. Adaptation of the linear form of correlation and analysis of specified model components also suggests previously stated, visually perceived statement. In fact, the function of the linear regression has the following form: $15.49 + 0.557 *x$, with the statistics $R^2 = 0.473$ and R= 0.7. Value of determination coefficient shows that 47.3% of total variations of *Innovation output* variable is explained by the variations of *Innovation input* variable, while the remaining 52.7% represents the result of the influence of the other factors which are not included in this model. A potentially significant correlation is also confirmed by the correlation coefficient 0.7. Its value indicates the existence of high grade, direct (straight line extending

from the lower left to upper right corner of a graph) linear correlation among the observed variables in countries included in the sample. The slope of the line $b_1 = 0.557$ indicates that the growth of *Innovation input* variable for one unit of its measurement leads to growth of *Innovation output* for 0.557. Testing of the hypothesis of linear independence of observed variables over the corresponding regression coefficient gave the value of the statistics test of 3.1474. With a probability level of significance of the test 0.05 and test threshold 2.201, it can also be concluded that there is statistically significant linear correlation between the observed variables *Innovation input* and *Innovation output*. Thus, given the values obtained with the proposed model, it can be concluded that the model is valid for statistical inference, and implementation of correct predictions and projections of *Y*.

CONCLUSION

If observed world-wide, global innovation index data analysis shows significant difference between the economies, even when they have similar general economic development. That could be the consequence of countries' implementation of various distinctive strategies. However, it is obvious that there is a significant correlation between innovation inputs and innovation outputs, if they are observed globally, while this correlation cannot be identified in the relation between global innovation index and innovation efficiency index (IFI).

Serbia and surrounding countries have innovation performance quality at a much lower level compared to other EU countries. One of the reasons for delayed transition of Serbian economy is its low innovativeness.

In considering the relationship between *Innovation Input* and *Innovation Output Index* for Serbia and a select group of countries, it was found that there was no statistically significant effect of innovation input on innovation *results.*

Considering the relationship between *Innovation Input Index* and *Innovation Output Index* for reference European countries revealed a potentially significant direct linear correlation, and statistically important impact (linear correlation) of inputs to innovation *results.*

Possible reason for this correlation disbalance within two observed groups of countries is that GII metrics is primarily appointed to the countries with high-profile national innovation system.

However, Serbia is the only country from the observed group of neighbouring countries which has a very similar subindex of innovation inputs and outputs, and because of this is on the first place in a group by innovation efficiency index. Unfortunately, it is our opinion that this is an echo of innovation inputs from the time of Yugoslavia, and that, in order to give recommendation and priorities for Serbian innovation system's further development, more serious focus on GII paremeters is necessary.

This requires further research after implementation of given metrics in following period of time.

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# ANALIZA INOVACIONOG POTENCIJALA SRBIJE U PERIODU 2009-2012. GODINE

*U ovom radu prvo je prikazan pregled značaja inovacionog potencijala zemlje za njen ekonomski rast i razvoj. Nakon toga su prikazane pozicije i vrednosti globalnog indeksa inovativnosti za 25 najinovativnijih ekonomija sveta, za Srbiju i za odabrane zemlje iz njenog neposrednog okruženja, za period od 2009 do 2012. U cilju klasifikacije odabranih zemalja u dve ili više grupa, na osnovu njihove sličnosti prema inovacionim performansama, izvršena je klaster analiza. Odnosi između inovacionih ulaza i inovacionih izlaza su prikazani na primeru odabranih grupa zemalja (grupa evropskih inovativnih lidera sa jedne i Srbije i njenih susednih zemalja sa druge strane ) putem korelacione analize.*

Ključne reči:  *inovativnost, inovacioni ulazi, unovacioni izlazi, inovaciona efikasnost.*

# THE INFLUENCE OF NATIONAL CULTURE ON CERTAIN TYPES OF ORGANIZATIONAL CULTURE

## UDC 316.722: 005.32

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**Abstract**. *National culture, among other factors, largely determines organizational behavior. The paper relates to influence of national culture on certain types of organizational behavior such as: motivation, organizational changes and communication process. Introductory section emphasizes the importance of proper understanding of the relationship between national and organizational culture, especially emphasizing the role of cultural factors that largely determine organizational behavior in modern conditions. The author first provides an overview of different perspectives in defining national culture. To explain the influence of national culture on certain forms of organizational behavior, the author uses Hofstede dimensions of national cultures. In that context, the author analyzes the influence of national culture on motivation and organizational changes. Various forms of communication that represent the consequence of different cultural influences are anylyzed further in the article. Final section of the paper provides conclusions about influence of national culture on motivation, organizational changes and communication process.*

**Key Words**: *national culture, organization, management, organizational behavior.*

### INTRODUCTION

In recent decades, a trend of more intensive research of national culture and its influence on certain forms of organizational behavior is emphasized. Emphasizing the importance of national culture in the functioning of organizations implies a standpoint according to which it is necessary, for design of management systems and techniques, to take into account the cultural context in which they will apply. In theory of organization and management, the opinion that there are universal principles of management, regardless of the above mentioned cultural differences prevailed for a long time. Contrary

to earlier prevailing belief in theories and researches that there are universal principles of management and organization applicable regardless of cultural differences, in recent decades there has been more awareness of the great importance of cultural factors that largely determine design and functioning of modern organizations.

Each organization has its own culture, which is predominantly influenced by the national culture of the society in which it was created. National culture determines values of organizational culture of companies that operate within its framework, and has significant influence on organizational culture and organizational behavior (Hofstede 1980, 2001; Trompenaars, Hampden-Turner, 1998). Some authors argue that national culture influences the style of thinking of managers of different nationalities and cultures, which is particularly evident when they work together. Thus, for example, certain cultures foster the right to freedom of speech, while other cultures consider that such right should be subordinated to interests of sthe ociety as a whole, etc. (Brooks, 2006: 271-295).

Nowadays, companies are faced with multiple challenges. Companies need to provide heterogenous workforce, that belongs to different cultural and ethnic groups, to work together to achieve common goals, thereby treating each individual regardless of its culture and identity. In order to achieve that, the organization must be aware of the importance that culture and approach the issue of cultural differences in a proactive manner. Only those organizations that employ people from different cultures can respond quickly and creatively to global society challenges. In addition, cultural differences can be neither neglected nor ignored. If ignored or if there is no awareness of them, it may cost the organization dearly.

Regardless of different standpoints regarding national culture, there is a general agreement on its crucial influence on the success of the organization, except that some factors may be affected more and some less. Since we live in time of changes, these changes also include changes in manner of business operations. Today's companies, if want to be successful, must adapt to the environment through a process of organizational changes. Communication can contribute to the success of an organization in a way that ensures it to be proactive, not just reactive, to have relevant and consistent influence on the environment, to be adaptable and future-oriented and, as such, to be ready to accept diversity in opinion and behavior. In this process, motivation should play a very important role. Therefore, the main objective of this paper is to point out the importance that national culture has on certain (the above mentioned) types of organizational behavior through analyzes of influence of national culture on motivation, communication process and organizational changes in the company, i.e. to show that national culture is the factor that dominantly determines certain types of organizational behavior.

## 1. DEFINITION OF NATIONAL CULTURE

National culture has many definitions. One of the most influential and multidisciplinary definition of culture is the one of Kroeber, an anthropologist and sociologist, according to whom the culture represents „transmitted and created content and patterns of values, ideas, and other symbolic-meaningful systems as factors in the shaping of human behavior and the artifacts produced through behavior (Kroeber, Parsons, 1958: 583). Definition of Geertz, an anthropologist, also deserves attention „Culture is an historically transmitted pattern of meanings embodied in symbols, a system of inherited conceptions expressed in symbolic forms by means of which men communicate, perpetuate, and develop their

knowledge about and their attitudes toward life" (Gerc, 1998:122). Certainly, the most widely quoted definition in the literature is the definition of a Dutch researcher Geert Hofstede, who contributed the most to the development of the study of cultural influences on organizations. According to Hofstede „National culture represents mental  programming: different patterns of thinking, feeling and potential acting, which were learned throughout (one's) lifetime" (Hofstede, 2001: 25).

For ease of understanding of national culture while respecting definitions of previous authors, for the purpose of this paper we will use a definition according to which „national culture represents a system of assumptions, values, norms, and attitudes, manifested through symbols which the members of an organization have developed and adopted through mutual experience and which help them determine the meaning of the world around them and how to behave in it" (Janićijević, 2013: 547). As with the organizational culture, as a result of the above mentioned definition, the national culture's content are: assumptions, values, norms, attitudes and symbols. However, in contrast to organizational culture in which norms, attitudes and symbols play a crucial role since they were created in it and according to which an organization functions, national culture is a little different. Given that  national culture lies deep into its members' subconsciousness, assumptions and values have greater importance while norms, attitudes and symbols are of less importance. Norms, attitudes and symbols result from proizilaze assumptions and values, but do not have such importance for national culture. Stories, anecdotes, and nonverbal behavior in both the family and society have a large role in transmission of values and assumptions. National culture assumptions and values develop at a young age and are very difficult to change. This definition implies that national culture assumptions and values are created through long-term experience and through interaction of society members, by solving problems the society is facing with and repeting successful solutions. In fact, as with the organizational culture, certain rules of understanding the world and behaving within it are created. These rules are transformed over time in values to be pursued, as well as assumptions about what is the nature of reality and relationships within it.

It follows from the definition that the content of culture, i.e. assumptions, values, norms and attitudes significantly determine the manner in which members of certain nation perceive and interpret the world around them and the way they behave in it. Since they share the same assumptions, values, norms and attitudes, the members of an ethnic community will interpret events that surround them in the same manner. As they move in the environment of their compatriots, who adopted the same assumptions and values in the same manner, they will be hard to believe that this is the only and right way of thinking and behaving in the world. However, as it is a larger social group, the power of typical national cultural pattern and homogeneity of thinking and behavior of members of a national culture is lower than in organizational culture. Certainly, the national cultural pattern exists, and it will sometimes stronger and sometimes weaker, direct the members of a nation to interpret the world around them and to behave in it in the same way.

## 2. HOFSTEDE'S STUDY OF NATIONAL CULTURES AND PARTICULAR DETERMINANTS OF ORGANIZATIONAL BEHAVIOR

### 2.1. National culture dimensions

In the seventies of the last century Geert Hofstede started a study that aimed to identify and measure dimensions of cultures. In other words, Hofstede wanted to measure national culture by comparing the attitudes and values of the members of different national cultures. The data for his original empirical study came from 116.000 questionnaires filled in by IBM employees in 40 countries and three regions. Thus, the dimensions of national culture of a society are as follows (Hofstede, 2001: 98):

1. Hierarchical distance, i.e. Power Distance – describes the extent to which the society accepts unequality among people;

2. Individualism versus Collectivism – represents the degree to which individuals in the society rather act as individuals, not as group's members;

3. Masculinity versus Femininity – explains whether the society prefers value of "masculinity" or "femininity" value;

4. Uncertainty Avoidance – deals with a society's tolerance for uncertainty and ambiguity.

5. Later, Hofstede added a fifth dimension 'Long Term Orientation versus Short Term Orientation' or Confucian Dynamism.

1. Power Distance represents „the extent" to which the less powerful members of organizations and institutions accept and expect that power is distributed unequally. Hierarchical levels correspond to certain hierarchical relationships that represent the epitome of power in terms of subordination of the subordinates. If there is complexity of activities within an organization, a multihierarchical structure with an appropriate division of labor and grouping of activities is required.

Power distance is a qualitative experience of management span. The span of management usually varies from level to level. In large organizations a limited span of management increases the number of levels in hierarchical structure, which as a result has the effect of increasing the number of intermediaries in the transmission of information and reducing the effectiveness.

Power distance also determines the appropriate leadership styles. In organizations with high power distance the superior does not share its power with its subordinates, nor consults them in decision-making process. Organizations with low power distance are characterized by involvement of employees in formal decision-making process. The authority of the manager applies only in those areas related to its scope and in which he is a competent one, while initiative, creativity, independence of thought are expected from the subordinates.

2. „Individualism stands for a society in which the ties between individuals are loose: everyone is expected to look after her/himself and her/his immediate family. Collectivism stands for a society in which people from birth onwards are integrated into strong, cohesive in-groups, which continue protecting them in exchange for unquestioning loyalty" (Hofstede, 2001:225).

Individualism and collectivism are significantly different. Individualism assumes that there is a free will of people, so that they can change things and influence their own destiny. Employees meet the pre-determined plan and do not tend to changes.Collectivism

implies the existence of a stronger social structure in which the collective is responsible for the destiny of an individual. The emphasis is given to involvement of an individual in an organization that is primarily moral, so the individual also feels emotional attachment to the organization.

3. „Masculinity versus femininity: Masculinity stands for a society in which social gender roles are clearly distinct: men are supposed to be tough, assertive and focused on material success; women are supposed to be modest, tender and concerned with the quality of life. Femininity stands for a society in which social gender roles overlap: both men and women are supposed to  be modest, tender and concerned with the quality of life" (Hofstede, 2001: 297).

4. Uncertainty avoidance represents „the extent a culture programs its members to feel either uncomfortable or comfortable in unstructured situations" (Hofstede, 2001:161). The main problem in this case is the extent to which a society tries to control uncertainty. However, in the same way that human society uses technology, law, religion in order to tackle with uncertainty, so the organizations use technology, rules and rituals thus reducing internal uncertainty caused by unpredictable behavior of its members.

5. Long-term versus short-term orientation relates to the extent to which culture affects its members to accept delayed satisfaction of their material, social and emotional needs. Namely, „long-term orientation stands for the fostering of virtues oriented towards future rewards, in particular perseverance and thrift. Its opposite pole, short-term orientation stands for the fostering of virtues related to the past and present in particular, respect for tradition, preservation of "face",  and fulfilling social obligations" (Hofstede, 2001: 359). In the long-term orientation cultures loyalty to the organization represents a special value. They give priority to values of learning, integrity, adaptability, responsibility and self-discipline, while leisure does not matter. Short-term orientation cultures put emphasis on freedom, rights, independence and leisure.

 Regarding specified dimensions, Hofstede believes that our opinions about organizations are most affected by hierarchical power distance and uncertainty avoidance. Hierarchical power distance gives us the answer to the question "Who has the power to decide", and uncertainty avoidance, "which rules and procedures will be respected in order to achieve the desired goals within the organization." These two dimensions affect the process of planning and control in organizations. Namely, the higher a person is on the hierarchical scale, the less formal are processes of planning and control, i.e. higher level of uncertainty avoidance requires more detailed planning and control. According to Hofstede, there are no universal principles of management and operations that would be equally applicable to all organizations, but these principles are the result of different theories that have the characteristics of the culture in which they arose. „Each country or region has unique features that no model can include " (Hofstede et. al., 2001).

The above mentioned dimensions of national culture will be used for explanation of the impact of national culture on motivation and organizational changes.

## 2.2. Influence of culture on motivation and organizations

There are a number of theories that deal with the relationship between culture and motivation which differ in the manner of origin, level of emporia support, practical

usability and the like. However, what is common to all theories is that most of them originated in the United States (Robbins, 2001: 175).

We will mention only some of the motivation theories where some differences in employees' motives may be noticed, which are mainly the consequence of different national cultures. Alderfer's theory analyzes needs and motives that drive people in organizations in different cultures (Janicijevic, 1997: 227). Thus, for example. basic needs (physiological and safety) are important in cultures with high uncertainty avoidance. Cultures with strong individualism, i.e. "masculine" values and low power distance value independence and individual efficiency. Cultures with so-called „feminine" values, collectivism and high power distance satisfy their existential needs through belonging and loyalty to collective. Likewise, connection needs (belonging, respect of others) are crucial in cultures characterized by high uncertainty avoidance and high power distance, collectivism and "feminine values". Development needs (self-esteem and self-actualization) are the most important in cultures where "masculine" values, individualism, low power distance and uncertainty avoidance prevail (Janićijević, 1997: 227-230)

The theory of Frederick Herzberg also deserves atention. According to this theory, and confirmed by numerous studies, the desire for interesting work is important almost to all workers, regardless of their national culture. For instance, the desire for interesting work seems important to almost all workers, regardless of their national culture. In a study of seven countries, employees in Belgium, Britain, Israel and the United States ranked "interesting workk" number one among 11 work goals. And this factor was ranked either second or third in Japan, the Netherlands and Germany (Robbins, Coulter, 2005: 408).

Likewise, in some East Asia cultures motivation for the achievement is not individual but group-oriented. For Japan  a group achievement motive is precisely the key "driving force" in organizations. Individual achievement is neither valued nor rewarded. On the contrary, in the U.S. individual achievements are much more valued and respected, and individuals who stand out from others are rewarded.

Hofstede believes that the influence of cultural values on motivation can be best explained by crossing two dimensions of national culture which are uncertainty avoidance and "masculine values". In that sense, Anglo-American culture and cultures of the United States, Great Britain and their former colonies have low uncertainty avoidance and strong masculine values. In these countries, motivation is based on personal, i.e. individual success, expressed in the form of wealth and honor. Cultures with low risk avoidance and feminine values are present in northern European countries and the Netherlands. Motivation in these countries is based on success and interaction between people, while success here is partly measured by "quality" of human relations and living conditions. (Hofstede, 2001: 386) High uncertainty avoidance and emphasized "feminine" values are typical for France, Spain, Portugal and the former Yugoslavia. Motivation in those countries reflects in safety needs and needs for belonging. Individual wealth and success are less important than mutual solidarity and group cohesion. In countries with high uncertainty avoidance and emphasized "masculine values" (Japan, German-speaking countries, Greece) motivation  essentially has personal, individual safety based on wealth and especially on the hard work. Furthermore, differences in motivation between people exist when people work for extrinsic money rewards and for the positive regard and support of their colleagues. In more communitarian cultures, this second source of motivation may be so strong that high performers prefer to share the fruits of their efforts

with colleagues than to take extra money for themselves as individuals. (Trompenaars, Hampden-Turner, 1998: 63)

Regardless of the fact that most contemporary motivation theories are considered culturally limited, the results of some studies (Gelfand, Erez, Aykan, 2007: 482) however show universality of certain motifves, such as the pursuit of personal efficacy, need for control, achievements and the like. However, specific factors that cause these motifves differ from culture to culture. Individualized feedback influences beliefs about personal effectiveness in individualistic cultures, whereas group feedback has the same effect in collectivistic cultures. Similarly, although the need for control is universal, personal culture is important in individualistic cultures, and collectivistic in collectivistic cultures. Although there are beliefs that the achievement motive is more strongly present in individualistic than in collectivistic cultures the more is present a standpoint that it is about existence of different meanings of this term in different cultures. Collectivists believe that positive results represent the outcome of collective effort, not just individual.

Erez and Earley believe that there are certain universal principles of motivation acceptable in different cultures. Content domain of human needs and motivations is universal. Needs for personal advancement, efficiency and consistency are universal human characteristics. What is different in cultures is the need to emphasize different needs, as well as means to meet them.

Certainly, when it comes to relationship between national culture and motivation the analysis of influence of certain cultural dimension to this process in organizations dominates.There is often aspiration to explain influence of culture to motivation through two-dimensional matrix. All explanations are interesting and stimulating, but ignore the fact that national cultures represent the wholes that cannot be reduced solely to individual dimensions. This requires application of a systemic or holistic approach that observes national cultures as wholes that cannot be reduced to its individual dimensions.

## 2.3. National culture and organizational change

Many authors indicate that understanding of certain activities in organizations varies between national cultures. National culture significantly influences the process of changes management in an organization. The nature of this influence can be seen through the following questions (Robbins, 2001):

Do people believe that change is possible?
If change is possible, what is the time period in which it can be implemented?
Is resistance to change greater in some cultures than in others?
Does culture affect implementation of the change planned?
Do successful change agents do different things in different cultures?

Do people believe that change is possible? Cultures differ in the extent to which its members believe that they have the ability to control their environment. In cultures where the prevailing belief is that the environment can be controlled, individuals will have a positive attitude towards changes (example for those cultures are the U.S. or Canada). In other cultures (for example, Iran or Saudi Arabia), people are considered subordinate to their environment and are likely to take a more passive attitude towards changes.

When it comes to time in which it is possible to perform the change, certain differences occur. Namely, in long-term oriented cultures (e.g. Japan) patience in awaiting positive results of planned changes has already been expressed. In short-term oriented cultures

(e.g. the U.S.), fast improvements will be expected and change programs accepted that promise quick results. The fifth dimension of Hofstede's model, long-term versus short-term orientation represents this aspect the best.

Is resistance to change greater in certain cultures than in others? Resistance to change will undoubtedly be influenced by the extent to which a certain culture relies on tradition. National culture of Italy is often cited as an example of the frequent reliance on the past, while the culture of the United States is believed to be focused on the present. Accordingly, resistance to change should be significantly higher in the first than in the second culture.

Regarding the influence of culture on the manner of implementation of planned changes, power distance is a dimension of culture that influences the above mentioned process. In cultures with high power distance (Philippines, Venezuela) changes will be autocratically imposed by top management layers in an organization. On the contrary, low power distance in certain culture presumes greater participation of all employees in implementation of organizational changes (e.g. cultures of Denmark and Israel).

Do successful change agents resort to various "techniques" of implementation of changes in different cultures? The answer to this question is affirmative. Members of cultures with emphasized power distance prefer that initiators of changes receive support from the top of the organization, in order to accept innovations themselves. Furthermore, the higher is uncertainty avoidance in the culture change agents are forced to, as far as possible, develop innovations within existing rules and procedures ( Robbins, 2001: 562).

When it comes to specific process of managing changes in organizations, the management of an organization, consciously or unconsciously over time develop its own approach to change management. Of course, this process is largely influenced by implicit assumptions, beliefs and values of managers that they adopt from national culture to which they belong. "The main determinants of the approach to change management in organizations are character and changes leadership style. In other words, the approach to change management is determined by commitment to a particular type of change and a certain style of leadership change"(Janićijević, 2008: 361)

When it comes to this subject, the question about the type of changes that will be applied in a particular organization and changes leadership style deserves special attention. As for the type of changes, despite the fact that all organizations go through everyday, incremental and partial changes, a gap between the organization and its environment is created over time. In this regard, in order to overcome the aforementioned gap, the need to carry out a comprehensive, radical and intensive changes (the so-called discontinuous changes) arises. Managers are expected to opt for a particular type of change. This choice is largely determined also by cultural factors. When it comes to choosing between continuous and discontinuous changes, the importance of two dimensions of national culture is primarily emphasized. Uncertainty avoidance and power distance. "Continual changes require low degree of uncertainty avoidance in the national culture, as these are incremental and partial, but everyday changes. The organization can be continuously changed only if members of such organization accept the fact that changes are inevitable and permanently present. We can expect such assumptions only in cultures with low uncertainty avoidance. In cultures with high uncertainty avoidance members of organization are not willing to accept everyday and frequent changes. They prefer the stability which inevitably leads their organization more frequent and faster to disharmony with the environment, thus causing the need for radical, transformational

changes. Therefore, in cultures with high uncertainty avoidance, the management of an organization will be prone to discontinuous changes. It seems paradoxical that a high degree of uncertainty avoidance leads to radical changes, revolutionary and comprehensive changes that bring a far greater degree of uncertainty than continuous changes. This is because members of organization in cultures with high uncertainty avoidance tend to eliminate the immediate sources of uncertainties in front of them. They will postpone changes as long as possible, and when it is not possible any more they will inevitably resort to radical changes. For members of cultures with high uncertainty avoidance, it is acceptable to face with rare and shorter periods of high uncertainty, than with low but constant uncertainty of evolutionary change" (Janićijević, 2008:362).

In addition to uncertainty avoidance, power distance can affect the choice between continuous and discontinuous changes. Namely, continuous changes are implemented through numerous smaller "adjustments" at all levels of the organization and because of that their initiation and management is under the competence of the lower levels managers. This implies a relatively even distribution of power and authority and decentralization of organization for which one of the cultural prerequisites is low power distance. On the other hand, radical, revolutionary and comprehensive (discontinuous) changes mean concentration of power in the person of a strong leader at the top of the organization, which is most common in cultures with high power distance.

Accordingly, the conclusion is that discontinuous changes will be more accepted and have chances for success in organizations of culture with high power distance and stronger uncertainty avoidance, in contrast to cultures characterized by low risk avoidance and less emphasized power distance which favors implementation of continuous changes. Of course, it has been mentioned earlier that all organizations are faced with and with both types of changes irrespective of dimensions of national cultures in which they function. Both, the aforementioned dimensions, influence predominant selection of the type of change and certainty of the success of such a choice (Janićijević, 2008: 363).

Style of leadership in organizational changes is also substantially influenced by national culture. The main leadership styles are directive and participative. It is clear that dimension of power distance mostly affects the choice of organizational changes leadership style. In cultures with emphasized power distance unequal distribution of power in organizations is accepted and considered justified. So, the leaders are expected to reach all important decisions, including decisions about the type and manner of implementation of changes. Directive leadership style (top-down approach) is appropriate for such a cultural orientation. On the other hand, national cultures characterized by low power distance imply an active role of employees in decision-making. It also refers to the process of organizational changes in which participative leadership style (bottom-up approach) is more likely to be successful and accepted by employees. Dimension of uncertainty avoidance also has similar impact on the choice of leadership style in organizational changes. Mentioned orientation implies reluctance of subordinates to changes and risks which they inevitably bring. When an organization is faced with inevitability of change, the more likely are inertia and passivity of employees and giving up to a directive leadership style by managers. Members of cultures with low uncertainty avoidance do not feel jeopardized in unclear and uncertain situations that accompany the process of change and, therefore, they actively participate in designing and implementation of changes. Dimension of individualism / collectivism also affects organizational change leadership style. In individualistic cultures where interest of the individual is primary, the choice of participatory leadership is more likely to be

accepted. On the other hand, collective interests have the primacy in collectivist cultures, which is primarily provided for by relying on leaders' decisions, which also applies to decisions on manner of implementation of changes, including the choice of directive leadership style as the most appropriate (Janićijević, 2008: 363-364).

So, there is no doubt that national cultures differ when it comes to accepting changes. Some cultures are changing slowly and actively oppose to changes, primarily because of their preference for traditional behavior. Other cultures accept the changes, but sometimes a considerable number of their members tries to re-establish traditional values and behavior and sees change as a threat. Finally, some cultures are ambivalent with respect to the changes and at the same time accept them, resist them and fear them. It is important for managers to understand sources of resistance to changes so they can anticipate and reduce them. Tradition, customs, limited resources, fear of losing power and influence and fear of the unknown, are forms of resistance to change that can be found in all societies (Francesco, Gold, 1998: 207).

### 3. Influence of National Culture on Communication Process

„We must never assume that we are fully aware of what we communicate to someone else .... Culture hides more than it reveals. Years of study have convinced me that the real job is not to understand foreign culture but to understand our own. I am also convinced that all that one ever gets from studying foreign culture is a token understanding" (Hall, 1976: 36-38).

From the above we may conclude that the American anthropologist Edward Hall sees the whole culture as one of communication forms. The relationship between communication and culture is reciprocal, complex and bidirectional. In 1959 Hall still considered that culture is communication and communication is culture (1990: 10).

He believes that communication acts as a transmitter of culture and thus influences its structure. Likewise, culture is manifested through communication, because people communicate according to the dictates of their culture. However, communication affects culture and vice versa. rephrase that, it is difficult to say what is the voice, and what is echo. This dualism exists because people "learn" about their culture through communication, which represents reflection of their own culture. Power of the link that connects communication and culture can be seen from the following questions:

For some castes in India rats are sacred animals, whereas in Europe and the U.S. people are destroying these rodents. Why?

Some people shake hands when introduced to a stranger, while others greet each other by bowing. Why?

The general answer to all these questions is the same: culture. Therefore, Hall explains all these differences as high and low-context culture (Samovar, Porter 2007: 22).

Depending on the manner of communication in cultures, Hall differs high and low-context cultures. The context is information that surrounds certain event which is also associated with that event. Cultures of the world can be divided into cultures with high and low-context. a high-context (HC) communication or message is one in which most of the information is either in the physical context or is internalized in the person, while very little is in the coded, explicit, transmitted part of the message. A low-context (LC) communication is just the opposite; i.e., the mass of information is vested in the explicit

code. „Japanese, Arabs and Mediterranean peoples, who have extensive information networks among family, friends, colleagues and clients and who are involved in  close personal relations are high-context. As a result, for most normal  transactions in family life they do not require, nor do they expect, much in- depth background information. This is because they keep themselves informed  about everything having to do with the people who are important in their lives. Low-context people include Americans, Germans, Swiss, Scandinavians and  other northern Europeans. They compartmentalize their personal relationships, their work, and many aspects of day-to-day life. Consequently, each time they interact with others they need detailed  background information. The French are much higher on the context scale than either the Germans or the  Americans. This difference can affect virtually every situation and every relationship in which the members of these two opposite traditions find themselves" (Hall, 1990:6).

Edward Hall clearly emphasized differences in the manner of communication in certain cultures explaining high and low-context cultures. In this regard, Hall defined concepts of both high-context and low-context culture. Low-context cultures rely on what is explicitly said or written in order to understand the message, while high-context cultures rely more on interpretation of elements that are external to the text.

Characteristics of high-context cultures are as follows:
- relationships between people are long-lasting and individuals feel strong interest for others;
- because of a strong communication with the help of a "common code" (the context) in routine situations - such a communication is cost-effective, fast and successful. High-context cultures include that context in communication. For example, the Japanese often bypass the main topic in communication, assuming that an intelligent man will be able to discover the topic of conversation from the context that communicate;
- people in top positions are personally liable for actions of their subordinates, which further evaluates mutual loyalty between superiors and subordinates;
- agreements are often rather verbal than written. This may mean that the written agreement is only "the best assumption", because after signing the contract in Japan people may seek for further changes. Even many contracts contain a provision that it can be renegotiated if circumstances change;
- "insiders" and "outsiders" are clearly separated. The outsiders are, in the first place, people who are not members of the family, clan, organization and finally strangers (i.e.other cultures' members);
- cultural patterns are deeply rooted and slowly changed.

On the contrary, low-context cultures are characterized by the following:
- relationships between individuals are relatively short and excessively expresed relatedness with others is not esteemed;
- communication messages must be clear and one can less rely on context and non-verbal communication in the process of communication;
- the authority is distributed through the whole bureaucratic mechanism and relations of personal responsibility are rarely established;
- agreements are often written rather than oral. Low-context cultures consider contracts as final and legally binding;

- ▪ "insiders" and "outsiders" are less clearly distinguished, which means that strangers easilyadapt to such a culture;
- ▪ cultural patterns are rapidly changing (Mead, 1998:27).

Therefore, people in different cultures communicate in different ways. Today there are more than 200 different languages and over 3000 different language versions. Not even one-half of the world is considered linguistically homogeneous. In some countries, there are several hundred different language versions (eg. Indonesia). Some languages, almost identical, are differently used in different countries, some words will be pronounced or written differently and even have different meaning (examples are British English and American English or German and Austrian German). When it comes to verbal communication two people can speak the same language (for example, people from the U.S. and England), and in fact do not understand each other. Language therefore is understood as a way of thinking, the system of values of a society. Learning language means learning culture (Rakita, 2003).

In addition to verbal, non-verbal communication is very significant particularly in certain cultures. Various studies show that impression we leave on others when communicating depends on what we say which is only 7%, how we pronounce it 38% and the most of our body language -55%. According to some estimates, 70-80% of communication is of non-verbal character. It implies that gestures, i.e. movements of head, arms, shoulders, look, how we use our eyes, voice, and even clothing. Every country has its code of conduct and interpretation of certain gestures, which represent reflection of itsculture. In this sense, the East uses non-verbal communication more than West. Also in this regard, experts distinguish between two types of culture: the culture of close and culture of distanced contact in communication. Cultures of close contact are characteristic for the Middle East, Indonesia, Latin America, Southern and Eastern Europe and are characterized by a high degree of intimacy (closeness), while cultures of distanced contact are typical for North America, Northern Europe and some Asian countries. It is also interesting that with the Russians, Arabs, French and Latino Americans kiss on the cheek or holding hands in the street is a common occurrence. For some other people, for example, the Anglo-Saxons and Asians it would be very inappropriate. In Japan and Korea other gestures are used when greeting and showing respect - they bow to each other and the depth of the bow depends on respect for the person you are bowing to. Arabs often watch their interlocutors in the eyes, because they believe that the eyes are the mirror of the soul, and that is very important to know the soul of the one you do business with. However, in contrast, Japanese children are taught in school not to look their teachers in the eyes but to direct their gaze at the region of their teacher's Adam's apple or tie knot (Rakita, 2003).

CONCLUDING OBSERVATIONS

Therefore, the general conclusion is that the national culture determines the rules of company's business operations in a social context.

When it comes to analyzing the influence on the motivation process it would be the best to apply those motivational techniques and procedures that are the most appropriate for a given national culture. It is important that manager techniques and procedures coincide with the values of national cultures of organization's members. In addition, it is

very important to know and understand your own cultural values. It is interesting that different authors distinguish different dimensions of national cultures that affect the most motivation process in organizations. In this regard, Hofstede distinguishes uncertainty avoidance and "masculine/feminine values". All dimensions act as a whole that cannot be reduced to influence of one or two, or all four of them individually observed. This confirms the need of applied systemic, i.e. holistic analysis of cultural influence on motivation in organizations. Thus, in analyzing national culture influence on motivational process it cannot be simply reduced to its two dimensions.

In analyzing the influence of national culture on organizational changes, the position on cultural limitation of most of the theories and techniques of organization and management is particularly evident. For example, the theory that explains this influence may not always be fully in line with cultural orientation of countries of its origin. In this sense, is necessary to introduce professional and humanistic values of researchers' professional culture that could explain the above mentioned discrepancy. Furthermore, in addition to influence of national culture on the process of organizational change, other factors that influence those processes may not be neglected. Namely, organizations pass through continuous and discontinuous changes. Therefore, the standpoint that the organizations are forced, due to some cultural dimensions, to apply specified type of change is not correct. What can be declared with certainty is that there is a high likelihood that, because of different dimensions of culture, some changes will have a greater chance of being accepted and more successful than others. It is important to note the disharmony between the culture and planned changes and to find ways to overcome such disharmony.

When it comes to the process of communication, organizations are nowday increasingly faced with new contacts, people and organizations from other countries. To be successful in working with people from other cultures, managers must be aware of cultural differences and similarities between a country of origin and a country in which they will do their business. The way of negotiation in some countries is largely determined by characteristics of national cultures of certain countries. Temperament, attitudes and way of thinking, moral and spiritual principles and other values shape behavior, and also the manner of communication among members of different countries. They also need to understand implications of diversity and to possess necessary communication skills to be able to decide in accordance with cultural specificities of the environment. The knowledge of corporate culture characteristics and the way of negotiating is an essential prerequisite for achieving successful business. Only in this way is it always and everywhere possible to achieve a successful business relationship, without occurence of any misunderstandings and bad emotions.

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# UTICAJ NACIONALNE KULTURE NA POJEDINE OBLIKE ORGANIZACIONOG PONAŠANJA

Nacionalna kultura, pored ostalih faktora, velikim delom određuje organizaciono ponašanje. Rad se odnosi na uticaj nacionalne kulture na pojedine oblike organizacionog ponašanja i to: motivaciju, organizacione promene i proces komunikacije. U uvodnom dijelu autor naglasava značaj pravilnog razumijevanja odnosa nacionalne i organizacione kulture, ističući ulogu kulturnih cinilaca koji u velikoj meri određuju ponašanje organizacija u savremenim uslovima. Autor u radu najpre daje prikaz različitih perspektiva u definisanju nacionalne kulture. Za objašnjenje uticaja nacionalne kulture na pojedine oblike organizacionog ponasanja, autor koristi Hofstedeove dimenzije nacionalnih kultura. U kontekstu toga analizira uticaj nacionalne kulture na motivaciju i organizacione promene. U daljem delu teksta analizirani su različiti oblici komunikacije koji su posledica različitih kulturnih uticaja. U završnom delu rada dati su zaključci o oticaju nacionalne kulture na motivaciju, organizacione promene i proces komunikacije.

Ključne reči:  *nacionalna kultura, organizacija, menadžment, organizaciono ponašanje.*

Review paper

# MANAGER'S ROLE IN RAISING THE LEVEL OF JOB SATISFACTION

## *UDC 005.88*

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**Abstract**. *Organizations, as a complex systems, in the structure of their subsystems have the human or social subsystem. It is a subsystem that has a significant influence on the functioning of the organization and its competitiveness. The quality of the social organizational subsystem is determined by the quality of the different variables that the subsystem includes. Job satisfaction is one of these variables. It is a variable that can have an adequate impact on the effectiveness and efficiency of the organization, as well as on its performance. The aim of the authors of this paper is to point out the nature, the significance, causes and consequences of job satisfaction, as well as the role of managers in raising the level of these organizational variables.*

**Key Words**: *job satisfaction, staff, management, organization*

## INTRODUCTION

Human behavior, in general, is determined by the nature of human attitudes (Simić, 2013, 188). Attitude is the appropriate disposition or tendency of an individual to respond to the stimuli from the environment in a positive or in a negative way (Bowditch, Buono, 1990, 94). Attitude can be defined as the evaluation of people, objects or ideas, which results in a positive or negative reactions to what is measured (Aronson, Wilson, Akert, 2005, 217). Job satisfaction is one of the most often studied human attitudes related to the job (Fraňek, Vačeřa, 2008, 63). Among other things, the reason for this is the fact that the modern organizations consider that their most valuable resources are their employees. Therefore they are aware of the fact that they can not reach the desired level of competitiveness if their employees, among other things, are not satisfied with the job they perform within the organization.

## 1. THE NATURE AND THE IMPORTANCE OF JOB SATISFACTION

Job satisfaction is a complex concept that can be accessed from a variety of aspects and that is interpreted in different ways by various authors. For example, there are theorists who identified job satisfaction with motivation. However, one should bear in mind the fact that job satisfaction is not the same as motivation. Job satisfaction can contribute to raising the level of employee motivation, but it is not always the case (Mullins, 2010, 700).

In the opinion of a number of theorists (Mullins, 2010, 700; Luthans, 2008, 141; Saari, Judge, 2004, 396), job satisfaction is, to a greater extent, the appropriate attitude and reflects the internal state of the individual. However, this does not mean that the two terms ("job satisfaction" and "motivation") can be used interchangeably. In fact, attitudes are broader categories in relation to job satisfaction, and job satisfaction is only one of the subgroups of human attitudes. It is the subgroup of human attitudes concerning the way in which individual evaluates the work done.

In mentioned theoretical circumstances, the most important definitions of job satisfaction are created. For example, Edwin A. Locke defines job satisfaction as a pleasurable or positive emotional state that is a consequence of the way in which individual evaluates their own job or their own experience (Locke, 1976, 1304). Authors Daniel Feldman and Arnold Hugh state that job satisfaction is the amount of positive feelings that an individual has in his job (Feldman, Arnold, 1983, 192). On the other hand, Robert Kreitner and Angelo Kinicki describe job satisfaction as an affective or emotional response of individuals to different aspects of the job they perform (Kreitner, Kinicki, 1995, 159). Keith Davis and John W. Newstrom believe that job satisfaction is a set of favourable or unfavourable feelings that employees have in relation to the work that they perform (Davis, Newstrom, 1989, 176). Andrew DuBrin said that job satisfaction is the amount of satisfaction one experiences doing their job (DuBrin, 1988, 58). Simply put, job satisfaction is a level of satisfaction that one feels while performing a particular job.

The level of job satisfaction could be lower or higher. However, determining the specific level of job satisfaction is not so simple. Among other things, it is complicated by the fact that theory offers different measures of job satisfaction. Some of the best known are (Judge, Klinger, 397-398):

1.  The Job Descriptive Index (JDI) - assesses job satisfaction with five different job areas: pay, promotion, coworkers, supervision, and the work itself (Smith et al., 1969);
2.  The Minnesota Satisfaction Questionnaire (MSQ) -  has its long and short forms (Weiss, Dawis, England, Lofquist, 1967);
3.  Brayfield and Rothe's (1951) Five Items Job Satisfaction Scale - includes five items:
    (1) I feel fairly satisfied with my present job;
    (2) Most days I am enthusiastic about my work;
    (3) Each day at work seems like it will never end;
    (4) I find real enjoyment in my work;
    (5) I consider my job to be rather unpleasant.
4.  Judge, Boudreau, and Bretz's (1994) a Three-item Measure of Job Satisfaction (Figure 1).

1. ALL THINGS CONSIDERED, ARE YOU SATISFIED WITH YOUR PRESENT JOB? (circle one)

      YES            NO

2. HOW SATISFIED ARE YOU WITH YOUR JOB IN GENERAL?

| VERY DISSATISFIED | SOMEWHAT DISSATISFIED | NEUTRAL | SOMEWHAT SATISFIED | VERY SATISFIED |
|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) |

3. BELLOW, PLEASE WRITE DOWN YOUR BEST ESTIMATES ON THE PERCENT OF TIME YOU FEEL SATISFIED, DISSATISFIED, AND NEUTRAL ABOUT YOUR PRESENT JOB. THE THREE FIGURES SHOULD ADD UP TO EQUAL 100%. ON THE AVERAGE:

    * THE PERCENT OF TIME I FEEL SATISFIED WITH MY PRESENT JOB _____ %

    * THE PERCENT OF TIME I FEEL DISSATISFIED WITH MY PRESENT JOB \_\_\_\_\_%

    * THE PERCENT OF TIME I FEEL NEUTRAL WITH MY PRESENT JOB \_\_\_\_%

                    TOTAL _____%

**Fig. 1** A three item measure of job satisfaction (Judge Boudreau, Bretz)
Source: Judge, Klinger, 398

Depending on the level of job satisfaction, its effects can be positive or negative. In any case, they are numerous and heterogeneous, which leads to the conclusion that the importance of job satisfaction in the organization may be multiple. In general, the impact of job satisfaction on the functioning of the organization and its employees, could be analyzed from several aspects. Among the most important are human-behavioral and economic aspects of job satisfaction. Although they are closely related and intertwined, their partial analysis contributes to a more accurate perception of specific consequences that job satisfaction or dissatisfaction can lead to (Figure 2). The most complex group of consequences, which may result in appropriate level of job satisfaction or dissatisfaction, are those of the human-behavioral nature. These are the consequences that primarily reflect the psycho-physical state of employees (e.g. monotony, physical effort, fatigue, mental stress, etc.) and the expression of different forms of employee's behavior. For example, low levels of job satisfaction can be one of the causes of the monotony at work, increased physical and mental fatigue of workers, pronounced mental stress in employees, etc. These psycho-physical manifestation of job dissatisfaction may be reflected in different behavioral aspects of organizational life. Thus, for example, as a result of increased job dissatisfaction, the organization may exhibit pronounced tendencies of absence from work, leaving the organization, being late for work, loss of co-operation among staff, frequent complaints by disgruntled workers and the like. Although the cause of the above problems should not only be the level of job satisfaction, in situations where the other agents can be excluded, it is expected that higher levels of job satisfaction will lead to a significant reduction or complete elimination of the above-mentioned problems.
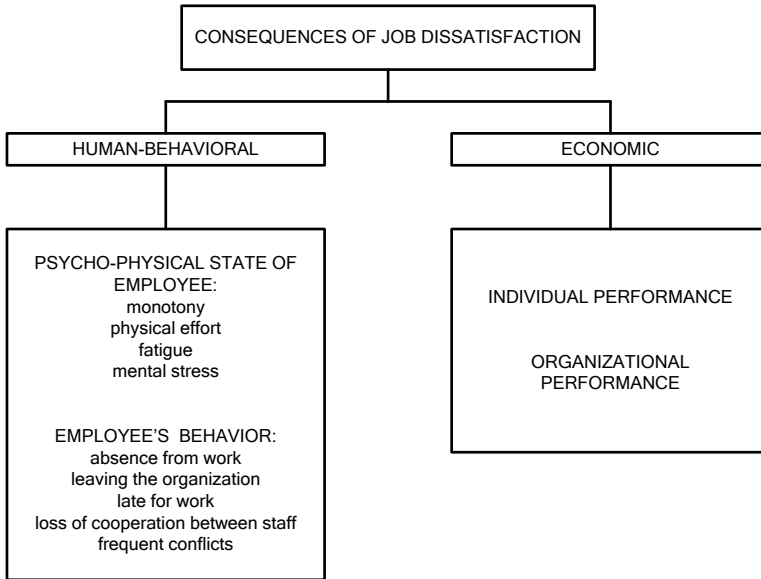
**Fig. 2** Consequences of job dissatisfaction

Practically inseparable with respect to the human-behavioral is the economic aspect of job satisfaction. This aspect refers to all economic (positive or negative) consequences that job satisfaction or dissatisfaction express in relation to the organization. Although these consequences could be analyzed in the context of the impact that job satisfaction has on the productivity, the quality and quantity of products or services etc., all of them, in combination with the above-mentioned consequences of human-behavioral aspects, have a corresponding impact on the overall performance of the organization.

The problem of the relationship between job satisfaction and performance of employees was the subject of numerous studies. Interestingly, the conducted research has offered a lot of variety and non particularly convincing results (see: Iffaldano, Muchinsky, 1985, 251-273). Only the meta-analysis conducted by Tim Judge and his colleagues has shown that there is a positive, though not particularly significant (.30) correlation between the level of job satisfaction and performance of employees (Luthans, 2008, 145).
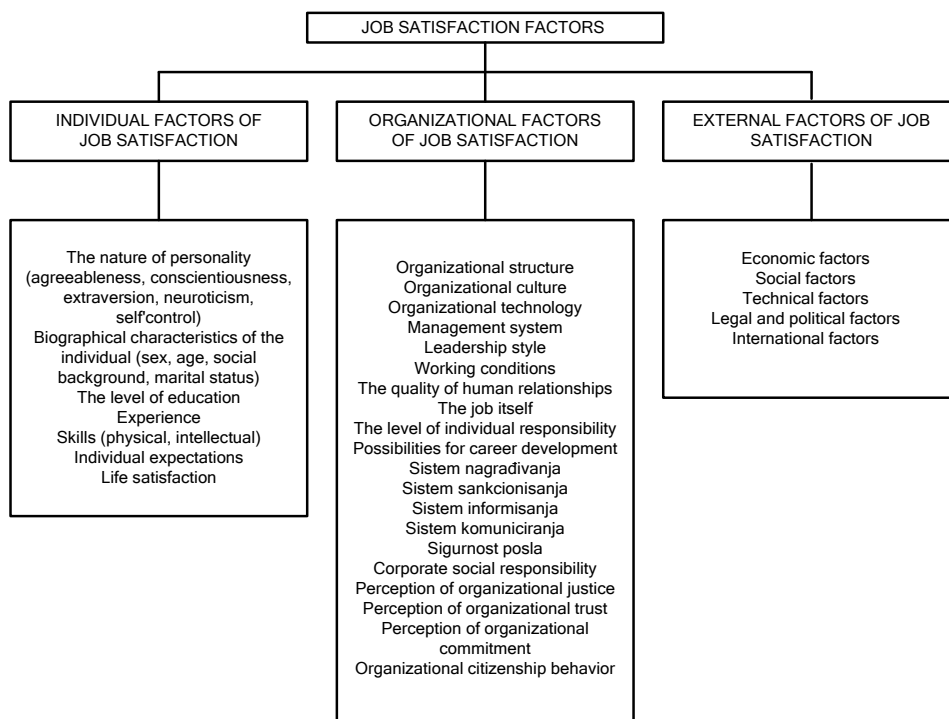
## 2. FACTORS OF JOB SATISFACTION

The positive impact of job satisfaction on various aspects (human, behavioral, economic) of organizational functioning, suggests that organizations and their managers must make reasonable efforts aimed at raising the level of job satisfaction. To achieve this, it is necessary to know the various factors that may influence the increase or decrease in the level of job satisfaction.

Starting from the key factors that influence job satisfaction, the literature offers three different approaches to job satisfaction. These are (Judge, Klinger, 398-399):
a) Situational approach to job satisfaction,
b) Dispositional approach to job satisfaction, and
c) Interactive approach to job satisfaction.

The Situational approach to job satisfaction suggests that job satisfaction is derived from the job characteristics. In contrast, the Dispositional approach to job satisfaction suggests that certain relatively stable characteristics of a person influence job satisfaction independently of the job characteristics and situation. The Interactive approach to job satisfaction suggests that the fit between the enviornment and the characteristics of a person influences job satisfaction. This approach is also known as the Person-Enviornment Fit (Fraňek, Vačeřa, 2008, 66).

In general, the factors that lead to strengthening or to a decline in the level of employees' job satisfaction, can be classified into three groups (Figure 3). One could be described as a group of individual or intrapersonal factors of job satisfaction. The second group of factors of job satisfaction are the appropriate organizational factors. The third group of job satisfaction factors are the so-called environmental factors.

JOB SATISFACTION FACTORS

INDIVIDUAL FACTORS OF JOB SATISFACTION | ORGANIZATIONAL FACTORS OF JOB SATISFACTION | EXTERNAL FACTORS OF JOB SATISFACTION

The nature of personality (agreeableness, conscientiousness, extraversion, neuroticism, self'control)
Biographical characteristics of the individual (sex, age, social background, marital status)
The level of education
Experience
Skills (physical, intellectual)
Individual expectations
Life satisfaction

Organizational structure
Organizational culture
Organizational technology
Management system
Leadership style
Working conditions
The quality of human relationships
The job itself
The level of individual responsibility
Possibilities for career development
Sistem nagrađivanja
Sistem sankcionisanja
Sistem informisanja
Sistem komuniciranja
Sigurnost posla
Corporate social responsibility
Perception of organizational justice
Perception of organizational trust
Perception of organizational commitment
Organizational citizenship behavior

Economic factors
Social factors
Technical factors
Legal and political factors
International factors

**Fig. 3** Factors of Job Satisfaction

Intrapersonal or individual factors of job satisfaction include different variables that are peculiar to the individual. This group of factors includes: the nature of personality

(manifested through different dimensions of personality, such as: extraversion, conscientiousness, agreeableness, openness to new experience and neuroticism), biographical characteristics of the individual (sex, age, social background, marital status and so on), their level of education, experience, different sets of personal skills (physical, intellectual), individual expectations, the level of life satisfaction and the like.

Results of some research showed that the different dimensions of personality may be related to the degree of job satisfaction. Thus, Barrick Murray R. and Mount Michael K. found that conscientiousness, as a dimension of personality, may be a valid indicator of the potential level of job satisfaction (Barrick, Mount, 1991, 1-26). Similar results are obtained by Mount Michael K. and his colleagues Judge Timothy A., Haller Deborah (Judge, Haller, Mount, 2002, 530-541). Also, in research examining the relationship between personality dimensions and job satisfaction, conducted in the pharmaceutical industry in Turkey, the authors Tesdimir Yeki M., Asghar Yaheer Muhammad and Saeed Sana have found that between four out of five personality dimensions contained in the Big Five model of personality, and the degree of job satisfaction, there is a significant positive correlation. According to this study, the correlation between job satisfaction and Neuroticism (a personality dimension) is negative (Tesdimir, Asghar, Saed, 10-11).

Sex is also one of the variables that, according to certain theorists, is associated with the level of job satisfaction. And while some studies have shown that males exhibit a higher level of job satisfaction (Lee), there are some studies that have denied this kind of correlation (Tesdimir, Asghar, Saed, 13). Some surveys have even shown that females exhibited higher levels of job satisfaction compared to males (Clark, 1997, 341-372).

Different results were obtained on the basis of research devoted to analyzing the impact of age of employees on the level of their job satisfaction. Some studies have shown that the level of job satisfaction decreases with the increase of age (see: Robbins, 2001, 24; Olorunsola, 49), while another study has indicated that job satisfaction rises to fifty or fifty-nine years of age, when it starts to decline (Saleh, Otis, 1964, 425-430).

A considerable number of previous studies devoted to job satisfaction takes into account the impact of man's life satisfaction on the level of his job satisfaction (Judge, Watanabe, 1994; Tait, Padgett, Baldwin, 1989). The results of these studies are shown that between these two variables there is a significant positive correlation. In fact, researchers have found that between the degree of job satisfaction and pleasure of individual's private life, there is a strong interaction. This is explained by the fact that the man's work is an integral part of his life and that these two variables are virtually inseparable (Saari, Judge, 2004, 398).

Researches devoted to job satisfaction are so numerous and diverse that among them there are those which examine the possible impact of human genes on the level of job satisfaction. One such study is conducted at the University of Minnesota. This research is concerned with testing the degree of job satisfaction among pairs of identical twins, who did not grow up together. This study showed that, to some extent, job satisfaction can be attributed to a person's genetic factor (Vecchio, 2003, 268).

A very important and quite interesting factor of job satisfaction is the level of employee's life satisfaction (of his private life), as well as their ability to coordinate their private life and business obligations. Discrepancy on this route, whether it is caused by excessive demands and expectations in the sphere of private or business life, will have a negative impact on the level of employee satisfaction (see: Calvo-Salguero, Carrasco-Gonyales, Salinas-Martinez, 2010, 1248).

Different organizational factors can affect the level of satisfaction at work. Among theorists there is no firm consensus on specific organizational factors whose influence on the level of job satisfaction could be characterized as critical. For example, Laurie J. Mullins believes that, although different organizational factors (the size of organization, formal organizational structure, structure of informal organizational relationships, organizational technology, management system, leadership style, working conditions, organizational culture, the quality of interpersonal relationships, etc.) can affect the level of job satisfaction, the special influence is achieved by the following factors (Mullins, 2010, 705):

- contributing to increase of the level of job satisfaction, such as: the diversity of jobs, inconspicuous surveillance, increase of accountability, opportunity for advancement, information on the achieved results;
- contributing to the decline of the level of job satisfaction, such as: unclear objectives, poor communication, lack of reward, job insecurity.

Exploring the results obtained on the basis of more than 3000 researches, Robert P. Vecchio stated that especially influential factors of job satisfaction are: hierarchical position one occupies in the organization, the length of time spent in the organization, and even the race that the individual belongs to (Vecchio, 2003, 266-267). Although the race is not an organizational factor of job satisfaction, because of its close relationship to the other two mentioned factors which belong to the organizational factors, they will be analyzed together.

Robert P. Vecchio says that the results of those studies showed that employees at higher hierarchical position in the organization demonstrated a higher level of job satisfaction compared to the employees who are at lower hierarchical positions. Also, those members who are working, for a long time, in a specific organization, express higher levels of job satisfaction in relation to employees who spend less time in the organization. Finally, Vecchio says that various surveys showed that Afro-american employees are less satisfied at work compared to Euro-american workers.

Of course, the insight into the impact of these factors on the level of job satisfaction does not mean that they should be taken "for granted". It is necessary to bear in mind that among these, as well as the many other factors of job satisfaction, there is interdependence. Thus, for example, for decades, Afro-american employees have occupied the lower positioned jobs, compared to workers of Euro-american origin. In these work places Afro-american workers have stayed significantly shorter compared to Euro-americans who are, at a higher hierarchical positions, trying to stay as long as possible (Vecchio, 2003, 266-267).

Over time, a number of theorists have concluded that the key factors of job satisfaction can be identified as following (Luthans, 2008, 142):

a) The work itself, i.e. the nature of the particular work that an individual performs. Among other things, this factor includes the extent to which a specific job is interesting and challenging to an individual, the degree to which the job provides the opportunity for an individual to keep abreast of new things or makes him/her responsible.

b) Earnings, i.e. the amount of financial compensation that an individual receives for the work he performs in the organization. This factor also involves the degree to which an individual is considering fair compensation they receive for their work, when compared to the earnings received by the other members of the organization.

c) Opportunities for advancement of a member of the organization, either in terms of those opportunities that are based on years spent within the organization, or on the achieved performance.

d) Supervision, i.e. the management style of surveillance of employees, which is reflected in the ability of a "supervisor" to ensure appropriate technical and behavioral support to the "supervised". Besides reviews of what employees are doing, this factor involves the degree to which the "supervisor" takes into account and respects the personal interests of employees, the degree to which he/she provides them with the necessary assistance, information and advices.

e) Collegiality reflects the attitude of other members of the organization to the particular employee. This factor of job satisfaction reflects the degree to which other employees are technically, professionally and socially ready to help their fellow, the degree to which members of the organization trust each other, and the extent to which the members of the organization are fair and correct to each other.

In certain studies (Judge, Church, 2000; Jurgensen, 1978) that were conducted over the years in different organizations and in different jobs, the employees were asked to rank the above-mentioned organizational factors of job satisfaction (the nature of the job, salary, promotion opportunities, supervision, collegiality). The results show that the majority of employees, as the most important factor of job satisfaction, separates the nature of the work that they perform. These results could be a valuable information for managers. Especially, if one takes into account the fact that a number of managers believe that earnings is the most important for employees, and that the salary is the key factor in job satisfaction (Saari, Judge, 2004, 397).

Corporate social responsibility is increasingly associated with job satisfaction. Numerous studies (Turker, 2009, 189-204; Brammer, Millington, Rayton, 2007, 1701-1719) have shown that positive perceptions of employees about the socially responsible behavior of their organizations have positive effects on various aspects of organizational functioning (affect the level of: organizational citizenship behavior, organizational justice, organizational trust, organizational commitment, etc.) Among other things, this perception of social responsibility has a positive effect on employee's job satisfaction (Tziner, Bar, Oren, Kadosh, 2011, 71).

The results of some studies, conducted over the last few decades, also indicating the present interaction between job satisfaction and the level of perceived: organizational trust, organizational justice, organizational commitment and organizational citizenship behavior (Camgoy, Karapinar, 2011; Al-Zu'bi, 2010; Eslami, Gharakhani, 2012; Iranzadeh, Chakherlouy, 2011).

Laurie J. Mullins points out that the ranking of organizational factors of job satisfaction varies depending on the type of organization. He said that the results of research conducted by Simmons T. and Enz C. A. (1995) show that the most important factors of job satisfaction for the employees of health care organizations, are: good salary, job security, and promotion opportunities. On the other hand, some studies that preceded the above, and that had to do with the degree of job satisfaction of employees in manufacturing organizations, showed that, to the employees in this type of organizations, the following factors are important: interesting work, recognition by peers and a sense of belonging to the organization (Mullins, 2010, 701).

The group of external factors of job satisfaction includes many other factors beyond man's personal and organizational environment. Some of these factors are those in the field of economic, social, technological, legal, political and international sector of external organizational environment. Ebru K. points out that certain economic, social and cultural conditions in a particular country may have a corresponding impact on the level of employees' job satisfaction (Ebru, 1995, 22). Certain researches (Saari, 2000; Saari & Erez, 2002) also pointed out that a national culture can also affect the nature of the attitudes of the members of particular nations. It follows that it is possible that the specific features of national culture influence the level of satisfaction of the members of the particular nations.

## 3. IMPLICATIONS FOR MANAGERS

The analysis of the importance of job satisfaction refers to the observation that the manager's role in maintaining a high level of job satisfaction, as well as its strengthening, is very important. Managers may use different sets of mechanisms with the aim of raising the level of job satisfaction. Of particular importance are the mechanisms that are in the fields of human resources and organizational behavior.

Almost every phase identified in the process of human resource management (human resource planning, recruitment of new and release of existing employees, selection of recruited candidates, orientation of new members, training staff, evaluating staff performance, developing the systems of compensation and benefits, providing career advancement) (Simić, 2010, 232), provides a wide area of activity with the aim of raising the level of job satisfaction. Also, almost all of the variables identified in the model or organizational behavior (Simić, 2009, 44) represent a potential "space" that a skilled manager can use for the purpose of raising the level of job satisfaction.

The above-mentioned studies, the results of which showed a positive correlation between the four (conscientiousness, agreeableness, extraversion, openness to new experience) out of five dimensions of personality and job satisfaction, as well as the negative correlation between job satisfaction and personality dimension labeled as Neuroticism, should be kept in mind while hiring new staff.

Independently, or with the help of experts, especially psychologists, managers can assess the nature of personalities of those candidates who apply for entry into the organization. In this way they can choose those candidates whose personality traits are conductive to increasing levels of job satisfaction. This means that, in terms of certain personality dimensions of recruited candidates, managers should select those candidates that are characterized by higher levels of conscientiousness, agreeableness, extraversion and openness to new experiences, as well as those with a lower level of Neuroticism.

For existing employees, managers need to look for appropriate mechanisms that may contribute to the strengthening of the dimensions of their personalities that positively correlate with job satisfaction (agreeableness, conscientiousness, extraversion, openness to new experience) as well as to mitigate the degree of Neuroticism of employees, as a particular dimension that correlates negatively with job satisfaction.

Also, information about the positive correlation between life satisfaction and job satisfaction, can be skillfully used by managers to the admission of new members of the organization, as well as for the managing of existing human resources. Selection of those

candidates who are judged to be satisfied with their lives, represent, in terms of raising the level of job satisfaction, a better solution compared to selecting those candidates whose level of life satisfaction is lower. Managers can, also, do the necessary efforts within the existing personnel for the purpose of improving the quality of their lives, i.e. raising the level of their personal life satisfaction. The widest scope of management activities, with the aim of raising the level of job satisfaction is the one positioned within the group of organizational factors of job satisfaction.

Generally, we could conclude that the improvement of almost any of the organizational variables (e.g. organizational structure, organizational culture, organizational technology, human resources, organizational climate, business strategy, etc.) can potentially contribute to increasing the level of job satisfaction within the organization.

The forward analysis of the impact of certain organizational variables on job satisfaction provides more concrete specification of potential activities of managers. With the aim of raising the level of job satisfaction, managers must also carefully and skillfully carry out the selection of new staff. At the very beginning, newly recruited staff should be provided full support, with the aim for them to fit better into the new working environment. This could be done by organizing proper orientation of new organizational members. The goal of the orientation is to provide a sense of safety, comfort and enjoyment of the new members of the organization within the available business comfort of particular organization. Also, the tasks that are delegated to the individual members of the organization, must be in accordance with their knowledge, skills and expectations. Task which are too simple can affect the decrease in the level of job satisfaction. The facts that employees prefer diverse, challenging, responsible and interesting tasks must be skillfully used by managers when they design specific tasks and jobs. Tasks that are delegated to employees must be clear, unambiguous, with precise objectives, supported by relevant information and other resources necessary to achieve them. Among other things, the tasks should be designed to provide an opportunity for further development and further advancement of employees. During the implementation of the tasks it is necessary to provide full support to every member of the organization. Managers are required to provide this type of support to their staff. At the same time, they must ensure that the members of the organizations help and support each other.

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# UPRAVLJANJE ZADOVOLJSTVOM POSLOM

*Organizacije, kao kompleksni sistemi, u strukturi svojih podsistema, kao dominantan, imaju i ljudski ili socijalni podsistem. U pitanju je podsistem koji ima značajan uticaj na funkcionisanje organizacije i na njenu konkurentnost. Kvalitet socijalnog organizacionog podsistema determinisan je kvalitetom različitih varijabli koje taj podsistem uključuje. Zadovoljstvo poslom jedna je od tih varijabli. U pitanju je varijabla koja može imati odgovarajući uticaj na efektivnost i efikasnost organizacije i na njene performanse. Cilj autora ovog rada je da ukažu na prirodu, značaj, uzroke i posledice zadovoljstva poslom, kao i na ulogu menadžera u povećanju nivoa ove organizacione varijable.*

Ključne reči:  *zadovoljstvo poslom, zaposleni, menadžment, organizacija.*

Review paper

# VALUE AT RISK MEASURING AND EXTREME VALUE THEORY: EVIDENCE FROM MONTENEGRO

*UDC 330.131.7(497.16)*

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**Abstract**. *The concept of value at risk (VaR) is a measure that is increasingly used for estimation of the maximum loss of financial position at a given time for a given probability. The aim of this manuscript is to show the most recent approaches for quantifying market risk. In particular, the manuscript investigates whether extreme value theory outperforms econometric calculation of VaR in emerging stock markets such as Montenegrin market. The paper is motivated by the desire that necessary attention is given to risks in Montenegro. Daily return of highly volatile stock EPCG (Elektroprivreda Crne Gore) from Montenegrin stock exchange is analysed for the period from January, 2004 – June, 2013. The sample of this structure and time dimension has not been discussed in empirical literature. Therefore, it is necessary to use the experience of the developed world's financial institutions which have studious approach to risk management, as well as the latest theoretical knowledge.*

**Key Words**: *Extreme value theory, Value at Risk, fat tails, GARCH model, peak over threshold, generalized Pareto distribution*

### INTRODUCTION

The risk from extreme events is present in all fields of risk management. Methodology used for the assessment of financial markets participants' rate of exposition to risk, gives the estimation of value at risk. Value at risk (Value-at-risk, or abbreviated VaR) is the maximum loss of financial position over a given time period at a given confidence interval. It includes all types of financial risk and the application in the analysis of market risk is to be presented in this manuscript.

It is intended to show the latest approaches to quantification of market risk in this paper, in a theoretical and practical context. The aim of this manuscript is to present the

estimation of VaR based on the analysis of specificities of financial time series, and to give empirical results of measuring Value at risk in Montenegrin financial market that is still developing. These include econometric evaluation, Riskmetrics methodology, quantile estimation and estimation based on extreme value theory. Econometric evaluation is derived from GARCH model, while Riskmetrics methodology uses IGARCH model.

There is a general opinion in literature data that there is no universal model giving the best estimation and forecast of VaR. Numerous papers observing the application of different approaches in developed financial markets confirm this – Caporin (2003), Christoffersen, et al. (2001), Angelidis, et al. (2004), Wong, et al. (2002), Alexander and Leigh (1997), Harimantzis, et al. (2006), Peters (2001), Embrechts, et al. (1999), McNeil, et al. (2000), Guermat and Harris (2002), So and Yu (2006).

On the other hand, there are very few papers observing the comparison of VaR models in developing financial markets. Gençay and Selçuk (2004) analized parameter models and quantile estimation of VaR of stock exchange indices in developing Central and Eastern European countries. These results show that generalized Pareto distribution and extreme value theory are basic tools in risk management in developing countries. Živković (2007) observed different approaches to VaR measuring on the example of new members and candidate countries for EU membership (Bulgaria, Romania, Croatia and Turkey). The conclusion of this research is that application of VaR models is not successful enough in financial markets of these countries because the returns show the existence of heavy tails, asymmetry and heteroscedasticity. Further researches followed in 2009, where Živković and Aktan analized VaR models of the returns of Turkish and Croatian stock-exchange indices with the onset of global financial crisis. It was concluded in this paper that extreme value theory and hybrid historical simulation are the best, while other models underestimate the level of risk. Anđelić, Djoković and Radišić (2010) observed Slovenian, Croatian, Serbian and Hungarian markets and concluded that under stable market conditions, the analized models give good forecasts of VaR estimations with 5% level of significance, while under the conditions of market volatility analized models give good estimations of VaR parameters with 1% level of significance. Nikolić-Đorić and Đorić (2011) observed the movement of stock-exchange index in Serbian financial market and concluded that GARCH models combined with extreme value theory – peaks over threshold method, decrease the mean value of VaR, as well as that given models are better than RiskMetrics method and IGARCH model. Also, Mladenović, Miletić and Miletić (2012), based on analysis of stock-exchange indices in Central and Eastern European countries (Bulgaria, Czech Republic, Hungary, Croatia, Romania and Serbia), came to conclusion that the methodology of extreme value theory is slightly better than GARCH model regarding the calculation of VaR, but general suggestion is to use both approaches for better measuring of market risk.

The purpose of this paper is to compare performance of econometric models, quantile estimation and extreme value theory in evaluting Value-at-Risk in Montenegrin stock exchange over long period that includes years of financial crisis. Results will be interesting given the recession period is included, and are relevant on micro and macroeconomic level. In particular, the manuscript investigates whether extreme value theory can outperform econometric calculation of VaR in emerging stock markets, and, in particular, Montenegrin stock market has not been discussed in empirical literature.

Now we are going to observe a portfolio of some risky assets and determine portfolio value as $V_t$ at a moment in time $t$. Let us assume that we want to determine the level of

risk over the period $[t,t+h]$. We mark the random variable of portfolio loss as $L_{t+h} = -(V_{t+h} - V_t) = \Delta V(h)$. Cummulative function of loss distribution is marked as $F_L$ where $F_L(x) = P(L \leq x)$. In this case, VaR at significance level $\alpha$ ($\alpha \in (0,1)$ - most often $\alpha = 0.01$ or $\alpha = 0.05$, i.e. 1% and 5%) is actually an α-quantile of distribution function $F_L$ and represents the smallest real number satisfying the inequation $F_L(x) \geq \alpha$, i.e.:

$$VaR_\alpha = \inf(x | F_L(x) \geq \alpha). \tag{1}$$

Expected shortfall (ES) is a measure closely related to VaR and practically often indicated as a measure overcoming conceptual disadvantages of VaR. For loss $L$, with its expected absolute value being definite, expected shortfall at significance level α is defined as

$$ES_\alpha = \frac{1}{1-\alpha} \int_\alpha^1 q_u(F_L) du, \tag{2}$$

where $q_u(F_L)$ is the quantile function of distribution function $F_L$. It is obvious that measure ES depends only on loss distribution, and $ES_\alpha \geq VaR_\alpha$. Therefore, this measure represents expected return value in case a marginal value (usually VaR) is exceeded.

## 1. METHODOLOGIES OF VAR

The type of value at risk estimation can be: 1. Quantile estimation (historical simulation), 2. Econometric evaluation (GARCH models) and 3. Estimation based on extreme value theory.

### 1.1. GARCH model

Generalized autoregressive conditional heteroscedasticity (**GARCH**) model, introduced by Bollersev (1986) and Taylor (1986), represents the generalization of autoregressive conditional heteroscedasticity model – ARCH, developed by Engle in 1982. Log returns, usually expressed in percents, are marked as $r_t$. Innovation at moment $t$ is $a_t = r_t - \mu_t$. Then, the model can be presented as follows (Tsay, 2010):

$$r_t = \phi_0 + \sum_{i=1}^p \phi_i r_{t-i} + a_t - \sum_{j=1}^q \theta_j a_{t-j} \tag{3}$$

$$a_t = \sigma_t \varepsilon_t$$

$$\sigma_t^2 = \alpha_0 + \sum_{i=1}^u \alpha_i a_{t-i}^2 + \sum_{j=1}^v \beta_j \sigma_{t-j}^2. \tag{4}$$

Parameters of equation (3) representing autoregressive moving-average model (ARMA) of orders p and q, ARMA $(p,q)$, are marked as $\phi_0, \phi_1, ..., \phi_p, \theta_1, ..., \theta_q$. The random member of the model, $a_t$, is the function of $\varepsilon_t$ - series of independent and identically distributed random variables having a normal or *t*-distribution with zero mean and variance equal to 1. By the second equation in the model - (4), conditional variance

of returns $r_t$ is modeled, $\sigma_t^2 = E((r_t - E(r_t))^2 | \Omega_{t-1})$, where $\Omega_{t-1}$ is available data set with moment $t$-1 inclusive. In other words, conditional variance (volatility) is expected squared deviation of observations from the mean given the available data set.

Parameters $\alpha_0, \alpha_1, ..., \alpha_u, \beta_1, ..., \beta_v$ of conditional variance equation satisfy the conditions $\alpha_0 > 0$, $\alpha_1, ..., \alpha_u \geq 0$, $\beta_1, ..., \beta_v \geq 0$, $\sum_{i=1}^{\max(u,v)} (\alpha_i + \beta_i) < 1$.

If the series $\varepsilon_t$ is a random variable with standardized normal distribution, i.e. $\varepsilon_t : N(0,1)$ then conditional distribution of random variable $r_{h+1}$ for available data with the moment $h$ inclusive, also has a normal distribution with mean $\hat{r}_h(1)$ and variance $\hat{\sigma}_h^2(1)$. Then, 5%-quantile of conditional distribution, representing the estimation of VaR at 95% confidence level and for forecast horizon 1 step ahead, is computed as:

$$\hat{r}_h(1) + 1{,}65 \hat{\sigma}_h(1). \tag{5}$$

If random variable $\varepsilon_t$ has Student's $t$ distribution, with $v$ degrees of freedom, then the 5%-quantile of conditional distribution is computed as follows:

$$\hat{r}_h(1) + \frac{t_v(1-p)}{\sqrt{\dfrac{v}{v-2}}} \hat{\sigma}_h(1), \tag{6}$$

where $t_v(1-p)$ is the corresponding critical value of $(1-p)$ quantile from $t$ distribution with $v$ degrees of freedom.

GARCH(1,1) model has the following form:

$$r_t = \phi_0 + \sum_{i=1}^{p} \phi_i r_{t-i} + a_t - \sum_{j=1}^{q} \theta_j a_{t-j} \tag{7}$$

$$a_t = \sigma_t \varepsilon_t, \qquad\qquad\qquad \varepsilon_t : N(0,1)$$

$$\sigma_t^2 = \alpha_0 + \alpha_1 a_{t-1}^2 + \beta_1 \sigma_{t-1}^2. \tag{8}$$

If the model GARCH(1,1) satisfies the parameters sum $\alpha_1 + \beta_1 = 1$, then the model describes the process of unlimited growth of conditional variability. Such a model is known as integrated GARCH model – IGARCH(1,1). It is in the basis of VaR estimation, representing the standard approach to risk measuring – **RiskMetrics**.

This methodology was developed by company J. P. Morgan (Longerstaey, 1995), and it implies that conditional distribution of the series of log daily returns is $r_t | \Omega_{t-1} : N(\mu_t, \sigma_t^2)$, where $\mu_t$ is conditional mean, and $\sigma_t^2$ is conditional variance of series $r_t$. The following relations are valid for them:

$$\mu_t = 0, \qquad \sigma_t^2 = \alpha \sigma_{t-1}^2 + (1-\alpha) r_{t-1}^2, \qquad 0 < \alpha < 1. \tag{9}$$

Volatility forecast for one period ahead in time shows that $\sigma_{t+1}^2 = \alpha \sigma_t^2 + (1-\alpha) r_t^2$. The previous relation indicates that $Var(r_{t+i} | \Omega_t) = \sigma_{t+1}^2$ for $i \geq 1$, and therefore, $\sigma_t^2[k] = k \sigma_{t+1}^2$. If the significance level is 5%, portfolio risk according to RiskMetrics methodology is computed using formula $1{,}65 \sigma_{t+1}$, i.e. daily VaR value of the portfolio is

$$VaR = Value\ of \quad financial \quad position \times 1{,}65 \sigma_{t+1}. \tag{10}$$

### 1.2. Quantile estimation (Historical simulation)

Historical simulation begins from the assumption that return distribution in the forecast period is the same as in the sampling period. Thus, the given return values of the sample are arranged according to size into a growing series in the form $r_{(1)} \leq r_{(2)} \leq ... \leq r_{(n)}$ with the first minimal and last maximal value.

Let us assume that returns are independent and identically distributed random variables with constant distribution whose probability density function is $f(x)$, and corresponding function of cumulative distribution $F(x)$. Let $x_p$ be $p$-quantile of the function $F(x)$. If $f(x_p) \neq 0$, then the statistic $r(l)$, where $l = np$, $0 < p < 1$, has approximately normal distribution with mean value $x_p$ and variance $p(1-p)/n[f(x_p)]^2$, i.e.

$$r_{(l)} : N(x_p, \frac{p(1-p)}{nf^2(x_p)}), \quad l = np. \tag{11}$$

### 1.3. Extreme value theory – Peak over threshold method (POT)

The extreme value theory is a very good methodological frame for the research of the trend of distribution tail. If we consider the problem of sample maximum, we come to the main mathematical problem which is in the basis of the extreme value theory.

Let $X_1, X_2,...$ be the series of independent, non-degenerate random variables having an even distribution, with the common distribution function $F$. Let us observe the maximum values of variables $(M_1 = X_1)$

$$M_n = \max(X_1, ..., X_n), \tag{12}$$

where $n \geq 2$.

For the joint limiting distribution function of maxima $M_n$, based on the character of their independence, it is:

$$P(M_n \leq x) = P(X_1 \leq x, ..., X_n \leq x) = \prod_{i=1}^{n} P(X_i \leq x) = \prod_{i=1}^{n} F(x) = F^n(x). \tag{13}$$

We will mark *the right end* of distribution $F$ with

$$x_F = \sup(x \in R : F(x) < 1). \tag{14}$$

Then, for every $x < x_F$,

$$P(M_n \leq x) = F^n(x) \to 0, \quad n \to \infty, \tag{15}$$

and, if $x_F < \infty$, for $x \geq x_F$

$$P(M_n \leq x) = F^n(x) = 1. \tag{16}$$

Therefore, distribution function, as $n \to \infty$, becomes degenerate. In order to obtain non-degenerate marginal distribution, it is necessary to carry out normalization (De Haan & Ferreira, 2006).

The problem comes to the determination of real constants $a_n > 0$ and $b_n$, so the variable $(M_n - b_n)/a_n$ has non-degenerate marginal distribution, as $n \to \infty$, i.e. $\lim_{n \to \infty} F^n(a_n x + b_n) = G(x)$. $G$ represents the non-degenerate distribution function and such distributions are called extreme value distributions.

Let the real constants be $a_n$ and $b_n$ ($a_n > 0$), so for every $n$ applies

$$\lim_{n \to \infty} P\{(M_n - b_n)/a_n \le x\} = \lim_{n \to \infty} F^n(a_n x + b_n) = G(x), \qquad (17)$$

for non-degenerate distribution function $G(x)$. If this condition applies, it is said that *F is in the domain of attraction of maxima from G*, i.e. $F \in D(G)$.

Extreme value distribution includes three parameters - $\gamma$ - *shape parameter*, $\beta_n$ - *location parameter*, and $\alpha_n > 0$ is *scale parameter*. They can be assessed in two ways: using parametric or non-parametric methods. Traditional approach – block maxima method largely dissipates data because only maximum values from great blocks are used. This is reported as the biggest disadvantage of this model, so in practice it is increasingly being replaced with the method based on **peaks over threshold**, where all data representing extremes are used, in the context of exceeding some high level. The given method is to be exposed as follows.

If we mark a certain threshold as $u$, and we observe the series of daily log returns $r_t$, then if $i^{\text{th}}$ excess happens on the $i^{\text{th}}$ day, this model is focused on the data ($t_i$, $r_{t_i} - u$). The basic theory of this new approach observes conditional distribution from $r = x + u$ which is for $r \le x + u$ given that threshold is exceeded, $r > u$:

$$P(r \le x + u \mid r > u) = \frac{P(u \le r \le x + u)}{P(r > u)} = \frac{P(r \le x + u) - P(r \le u)}{1 - P(r \le u)}. \qquad (18)$$

The main distribution used for the modeling of excess over the threshold is *generalized Pareto distribution,* defined in the following way:

$$G_{\gamma, \psi(u)}(x) = \begin{cases} 1 - (1 + \dfrac{\gamma x}{\psi(u)})^{-1/\gamma}, & \gamma \ne 0, \\[2ex] 1 - \exp(-\dfrac{x}{\psi(u)}), & \gamma = 0, \end{cases} \qquad (19)$$

where $\psi(u) > 0$ and $x \ge 0$ for $\gamma \ge 0$, and $0 \le x \le -\psi(u)/\gamma$ when $\gamma < 0$. Therefore, we conclude that conditional distribution from $r$, if $r > u$, approximates well with generalized Pareto distribution with parameters $\gamma$ and $\psi(u) = \alpha + \gamma(u - \beta)$. Parameter $\psi(u)$ is called *scale parameter*, and $\gamma$ is *shape parameter*.

Generalized Pareto distribution has a very significant feature. If the excess distribution from $r$ with the given threshold $u_0$ is generalized Pareto distribution with shape parameter $\gamma$ and scale parameter $\psi(u_0)$, then for arbitrary threshold $u > u_0$, the given excess distribution for threshold $u$ is also generalized Pareto distribution with shape parameter $\gamma$ and scale parameter $\psi(u) = \psi(u_0) + \gamma(u - u_0)$.

When the parameter $\gamma = 0$, then generalized Pareto distribution is exponential distribution. Therefore, it is suggested to carry out a graphic examination of the tail behaviour using QQ plot. If $\gamma = 0$, then the graph of the excess is linear.

Peaks over thresholds model has a problem regarding the choice of an adequate threshold. This is how the given problem is usually solved in practice.

For the given high threshold $u_0$, let the excess $r - u_0$ follow generalized Pareto distribution with parameters $\gamma$ and $\psi(u_0)$, where $0 < \gamma < 1$. Then, the *mean excess* over the threshold $u_0$:

$$E(r - u_0 | r > u_0) = \frac{\psi(u_0)}{1 - \gamma}. \tag{20}$$

*The mean excess function* in the mark $e(u)$ is defined, for every $u > u_0$, as:

$$e(u) = E(r - u | r > u) = \frac{\psi(u_0) + \gamma(u - u_0)}{1 - \gamma}. \tag{21}$$

Therefore, for the given value $\gamma$, the mean excess function is the linear function of excess $u - u_0$. Hence, for the determination of the given threshold $u_0$, a simple graphic model is used, forming the empirical mean excess function as

$$e_T(u) = \frac{1}{N_u} \sum_{i=1}^{N_u} (r_{t_i} - u), \tag{22}$$

where $N_u$ is the number of returns exceeding the threshold $u$, and $r_{t_i}$ are the values of given returns. Threshold $u$ is chosen so the empirical mean excess function is approximately linear for $r > u$.

For the given probability p in the upper tail, $(1-p)$-quantile of log return $r_t$ is

$$VaR = \begin{cases} \beta - \dfrac{\alpha}{\gamma} \{1 - [-D\ln(1-p)]^{-\gamma}\} & \gamma \neq 0, \\ \beta - \alpha \ln[-D\ln(1-p)] & \gamma = 0. \end{cases} \tag{23}$$

VaR evaluation is much more stable using the peaks over thresholds method because with the traditional approach, VaR is very sensitive to changes in the size of blocks $n$.

The measure of Expected shortfall, as an expected loss if VaR is exceeded, then can be defined as

$$ES_q = E(r | r > VaR_q) = VaR_q + E(r - VaR_q | r > VaR_q), \tag{24}$$

i.e.

$$ES_q = \frac{VaR_q}{1 - \gamma} + \frac{\psi(u) - \gamma u}{1 - \gamma}. \tag{25}$$

## 2. EMPIRICAL RESULTS

The purpose of empirical analysis is the evaluation of risk measures for daily returns, for one stock in Montenegrin stock market. The best way is to choose a stock having showed a pronounced volatility in the previous period, able to illustrate advantages and disadvantages of each model. For these reasons, a stock of Elektroprivreda Crne Gore (EPCG) was chosen, illustrating models of VaR calculation. Time series of logarithmic returns of EPCG's stock, were observed on daily basis in the period from 9th January of

2004 until 18$^{th}$ June of 2013 (2338 data in total). Log daily returns (or continuously compounded returns), represent the difference between logarithmic levels of prices in two successive days. It can also be expressed in percents, when these differences are multiplied by 100. The data are taken from the website of Montenegro berza AD Podgorica, retrieved from http://www.montenegroberza.com.   Empirical results are obtained using program package R.

Daily return of the EPCG stock is stationary (Fig. 1). Its empirical distribution differs from normal distribution, which is indicated by the skewness and curtosis, as well as the joint indicator of normality – Jarque-Bera test-statistic (JB). These descriptive statistics are shown in Table 1. The value in parenthesis next to the value of test-statistic is the corresponding *p*-value.

**Table 1** Basic descriptive statistics of daily return for EPCG

| Variance | Skewness | Curtosis | JB | Box-Ljung (m=8) | Box-Ljung ($a_t^2$) |
|---|---|---|---|---|---|
| 23.96 | 0.6 | 19.88 | 38709.92 (<2.2e-16) | 101.76 (<2.2e-16) | 1032.92 (<2.2e-16) |

The given return series is not too asymmetric, which can be seen from the skewness indicator, but the high curtosis indicates that the it is above normal, i.e. there are "heavy tails" – tails are heavier than those in normal distribution. Jarque-Bera (JB) normality test shows that the hypothesis of normality of returns can be abandoned even when the level of significance is 1%. JB test-statistic has an asymptotic $\chi^2$ distribution with two degrees of freedom.

The next in Table 1. is Box-Ljung test-statistic (Box-Ljung). It is used for the determination of autocorrelation of order *m* between squared data and has asymptotic $\chi^2$ distribution with *m* degrees of freedom. Null hypothesis in this test implies that the first *m* autocorrelation coefficients of squared data are zero and it is abondoned here. Value *m* is chosen in several ways and in practice the best form is $m \approx \ln(T)$, where T is the number of data of the observed variable (Tsay, 2010). In our case, for *m* this value is 8.
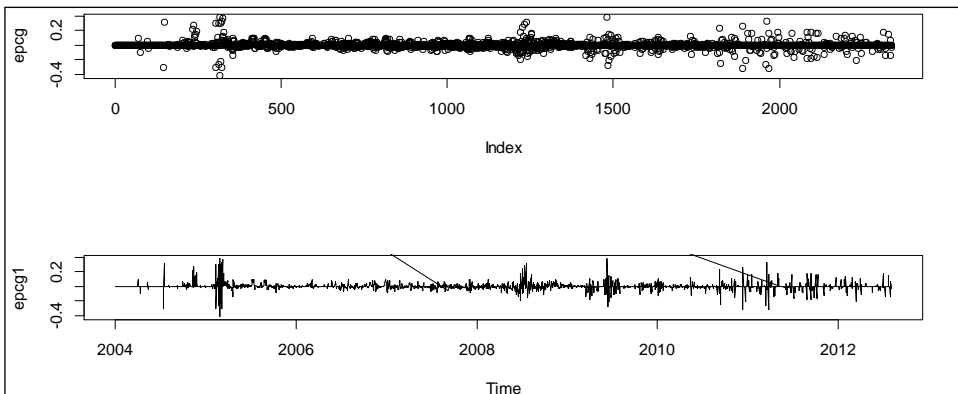


**Fig. 1** Daily return of EPCG stock
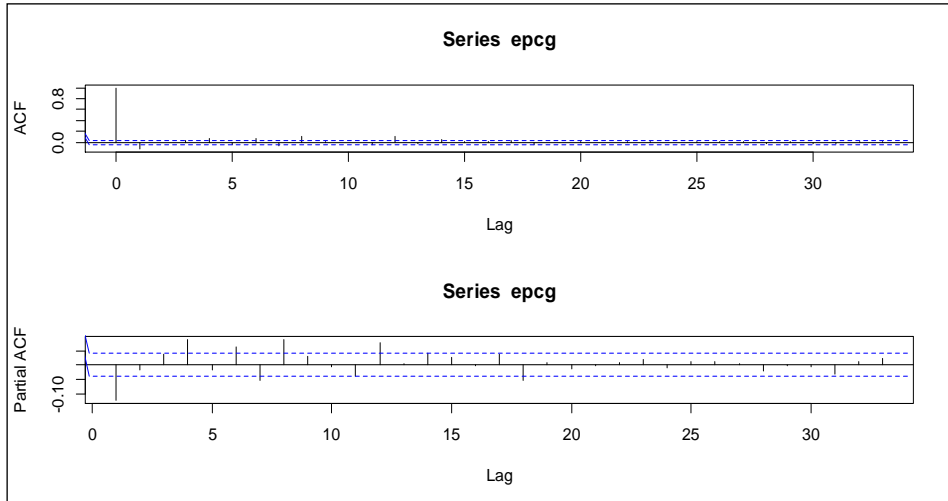
**Fig. 2** Autocorrelation functions (ACF) and partial autocorrelations for EPCG series

To determine the existence of time-changing variability, the same Box-Ljung test-statistic is used, but for squared residual series (McLeod and Li, 1983, Tsay 2010). Return residual is defined as the difference between return level and mean of the return, i.e. $a_t = r_t - \mu_t$. For the return of EPCG, first the serial correlation was determined according to Box-Ljung test-statistic for the return data, and the same statistic for squared residuals also shows high volatility.

As daily return rate of EPCG stocks has an unstable variance, its dynamic is evaluated using GARCH model. Based on the specification analysis − sample functions of autocorrelation and partial correlation (Fig. 2) − it is estimated that the best model is ARMA(1,3). Volatility movement is well described by model GARCH(1,1).

Jointly estimated ARMA(1,3)-GARCH(1,1) model is:

$$r_t = -0.000016929 + 0.99696 r_{t-1} + a_t + 0.87183 a_{t-1} + 0.17137 a_{t-2} - 0.051543 a_{t-3},$$
$$\sigma_t^2 = 0.00018531 + 0.17587 a_{t-1}^2 + 0.74366 \sigma_{t-1}^2.$$

All model coefficients are already significant at significance level 1%, except free members in both equations, which are significant at level 10%.

The tests of residual normality, autocorrelation and conditional heteroscedasticity are given in Table 2. Therefore, it can be observed that the chosen model, which was the best of all econometric models (not all parameters were significant within other models), describes volatility really well. However, GARCH model did not remove autocorrelation successfully, which can be seen from Box-Ljung test. Autocorrelation was reduced enough, which can be concluded based on the autocorrelation of standardized residuals function, Figure 3.
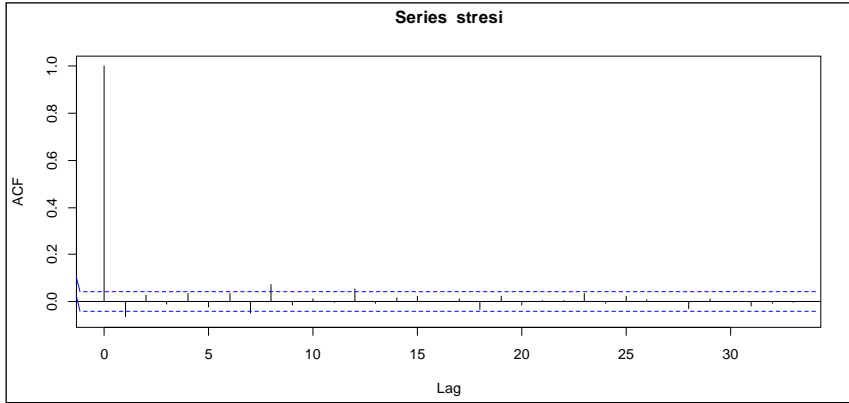
**Fig. 3** Autocorrelation of standardized residuals function of model ARMA(1,3)-GARCH(1,1)

**Table 2** Tests of ARMA(1,3)-GARCH(1,1) models: test-statistic and *p*-value

| JB | Box-Ljung Q(10) | Box-Ljung ($a_t^2$) | LM ARCH Test |
|---|---|---|---|
| 75584.7 (0) | 37.75 (4,2e-05) | 4.2146 (0.937) | 5.46 (0.94) |

Table 3. forecasts levels of return and volatility (conditional standard deviations) for one day time horizon, which are used for the assessment of VaR. The assessments are computed for level of confidence 95% and 99%.

Interpretation of the obtained result for VaR is as follows: if one possesses some value of EPCG stocks (for example, 1000€), then the possible loss for the owner of stocks for a one-day period does not exceed 7.483% of the value (74.83 €) with probability 95%. With the 99% probability, the estimation of the maximum loss is 10.65% of the value (106.5 €).

**Table 3** Econometric evaluation of VaR for a one-day period  (EPCG return)

| Return forecast | Forecast of conditional st. dev. | VaR (95%) | VaR (99%) |
|---|---|---|---|
| -0.00092457 | 0.04619341 | 7.483% | 10.65% |

**Riskmetrics** method for the calculation of VaR assumes that conditional mean value is zero and that return volatility follows IGARCH(1,1) model. The adjusted model is

$$r_t = a_t, \quad a_t = \sigma_t \varepsilon_t, \quad \sigma_t^2 = 0.041657 \sigma_{t-1}^2 + (1 - 0.041657) a_{t-1}^2,$$

where $\varepsilon_t$ is standard Gaussian series of white noise. Q statistic for squared standardized residuals is rather low (0.0005967), but not statistically significant.

According to the adjusted model, volatility forecast for one period in advance is $\hat{\sigma}(1) = 0.04951$, so 95% quantile of conditional distribution is $1.65 \times 0.04951 = 0.0816915$. VaR for  95% probability, one period in advance, for the position of, for example, 1000 €, will be

$$VaR = 1000€ \times 0.0816915 = 81.6915€.$$

According to the same principle, 99% quantile is $2.326 \times 0.04951 = 0.11516026$, so VaR, for the given probability is approximately 115.16€.

**Quantile assessment** of VaR is obtained as empirical 99% quantile, with the value of daily return for EPCG is 14.64244%, which means if we possess 1000 € worth EPCG stocks, the loss in one-day period does not exceed 146.4244 €, with 99% probability. The measure of expected shortfall for the same probability is 23.19685%, which means that if VaR is exceeded, for the same possession of 1000€ worth EPCG stocks, the loss expected in one-day period is 231.97 €. With confidence level 95%, VaR amounts to 5.395%, and the measure of expected shortfall is 11.69%.

The following is the evaluation of VaR based on the new approach of extreme value theory − **peaks over threshold method**. Negative logarithmic returns of EPCG stocks are observed, and according to literature for the series of stable returns, we usually choose 2.5% for threshold *u*. Fig. 4 shows, based on Q-Q plot, that the given returns derogate from normal distribution, so it is concluded that coefficient $\gamma \neq 0$. Also, the graph of mean excess function is linear up to threshold level 3%.
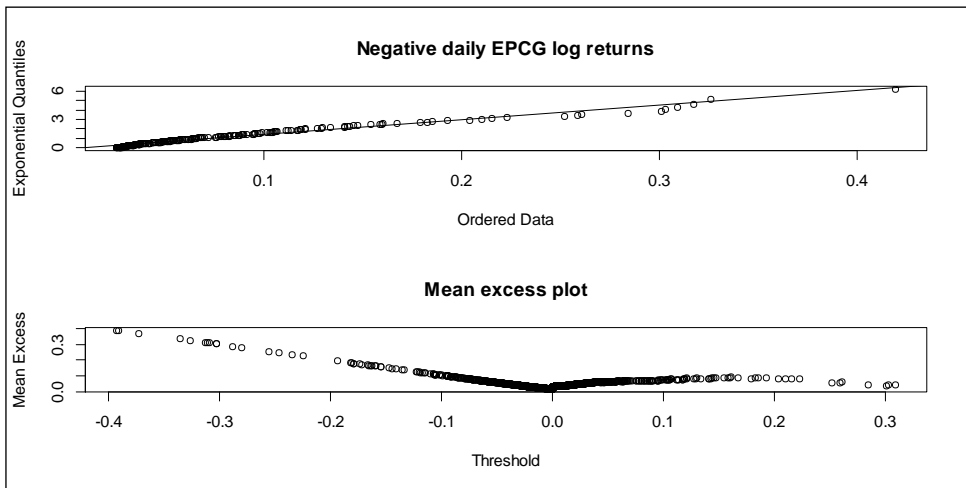


**Fig. 4** Q-Q plot of excess over 2.5% threshold and mean excess function plot

**Table 4** Result assessments of two-dimensional Poisson model of EPCG daily negative log returns[1]

| Threshold | Exceeding | $\gamma_n$ | $\alpha_n$ | $\beta_n$ |
|---|---|---|---|---|
| 3% | 213 | 0.271 (0.084) | 0.02 (0.0056) | -0.0383 (0.012) |
| 2.5% | 251 | 0.31 (0.078) | 0.017 (0.04) | -0.03058 (0.008) |
| 2% | 315 | 0.437 (0.072) | 0.0109 (0.002) | -0.015 (0.0045) |

[1]Standard assessment errors are given in parentheses.

The set of extreme events exceeding the 2.5% threshold has 251 data. Based on this data set, the distribution of maximal negative logarithmic returns for EPCG stocks is

modeled. Table 4 contains the estimation of parameters $\gamma$, $\alpha$ and $\beta$ for the given data set, with the variation of threshold from 2% to 3%. Given parameters are used for the calculation of VaR and the adequacy of the given model can be based on plots which can be seen in Fig. 5.

The four plots show good accomodation of generalized Pareto distribution to the data. Q-Q plot (lower right graph) shows slight derogations from the straight line, which is also confirmed by tail probability assessment on the logarithmic scale (lower left graph), leading to conclusion that the modelling is appropriate.

Peaks over threshold method gives results for VaR and expected shortfall, summed up in Table 5. It is concluded that parameter results are more stable compared to econometric modeling (GARCH model and RiskMetrics), which shows parameter estimation variations depending on the choice of type of GARCH model (GARCH(1,1) or IGARCH(1,1)). It is evident here that results of VaR and expected shortfall differ less depending on different values of threshold excess, and with the same probability assessment. General conclusion is that this approach is superior to the econometric evaluation of VaR.
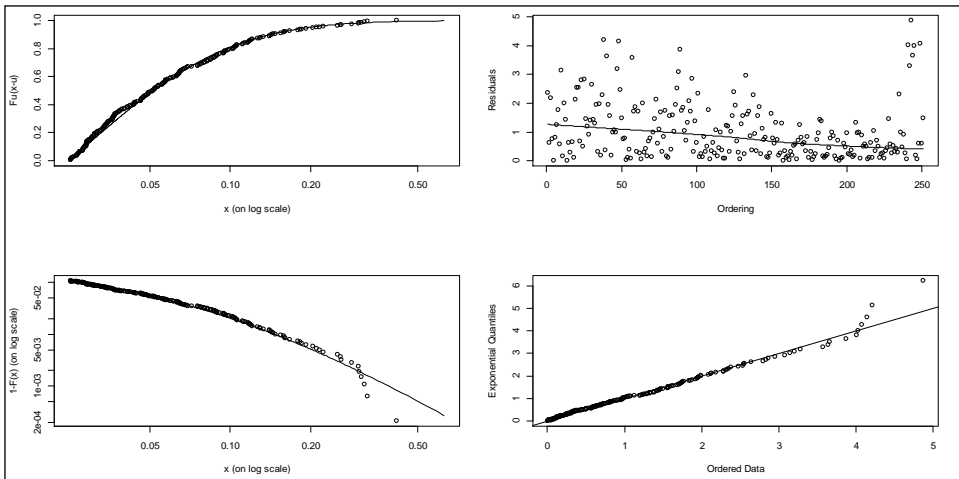


**Fig. 5** Plots of generalized Pareto distribution adjustment to EPCG daily negative log returns

**Table 5** Assessments of results of VaR and expected shortfall based on peaks over thresholds method

| Threshold | p-value | VaR | Expected Shortfall |
|---|---|---|---|
| | 0.05 | 0.05490012=5.49% | 0.1185879=11.86% |
| 2.5% | 0.01 | 0.14661115=14.66% | 0.2514971=25.15% |
| | 0.001 | 0.389812=38.98% | 0.603948=60.39% |
| | 0.05 | 0.0526414=5.26% | 0.1246470=12.46% |
| 2% | 0.01 | 0.1473389=14.73% | 0.2927310=29.27% |
| | 0.001 | 0.4724329=47.24% | 0.8697588=86.98% |
| | 0.05 | 0.05526823=5.53% | 0.1179026=11.79% |
| 3% | 0.01 | 0.14737246=14.74% | 0.2443104=24.43% |
| | 0.001 | 0.37328683=37.33% | 0.5543650=55.44% |

Further, in order to compare the results, Value at Risk obtained using different calculation methods can be summed. If we possess 1000€ worth EPCG stocks, with 5% level of significance, meaning there is 95% probability the loss would be lower or the same as VaR for the following trading day, the parameter value is: 1) 74.83€ applying ARMA(1,3)-GARCH(1,1) model; 2) 81.6915€ applying RiskMetrics method; 3) 53.95€ by quantile estimation, and 4) 54.9€ applying peaks over threshold method (threshold is 2.5%).

The corresponding parameter values with 1% probability are: 1) 106.5€ applying ARMA(1,3)-GARCH(1,1) model; 2) 115.16€ applying RiskMetrics method; 3) 146.4244€ by quantile estimation, and 4) 146.6€ applying peaks over threshold method (threshold is 2.5%).

Due to different treatment in the estimation of statistic distribution tail behavior, there are different results obtained as well. The result of econometric assessment (ARMA-GARCH models and RiskMetrics), in case all assumptions for its applications are accomplished, depends on the chosen model. Therefore, it is necessary, as we have shown on the example, that a detailed analysis of the specification of potential models is the first phase in the performance of Value at Risk evaluation. It can be concluded that econometric estimation proved to be unstable, as they are on the upper bound at 5% significance level, and at 1% significance level they are on the lower bound of possible VaR movement interval.

Further, the choice of tail distribution probability also has an important role in the calculation of VaR. The value of the observed sample of 2338 data may be considered big enough for empirical quantiles with 99% and 95% probability for giving good parameter estimation. For both levels of significance, quantile Value at Risk evaluation is very close to the assessment of the new approach of extreme value theory. We note that these two assessments at 1% significance level are on the upper bound of the possible VaR parameter range.

Also, within the latter approach (Table 5), we can see that using a very low 0.1% probability, less reliable VaR evaluation are obtained. Therefore, that significance level was not used in other approaches.

## CONCLUSION

Results of empirical analysis have multiple benefits. They show that *the assessments of Value at Risk based on extreme value theory are better than econometric evaluations.* It is obvious that econometric evaluations proved to be very unstable at the assessment of Value at Risk. Results showed that at 5% significance level, given evaluations are on the upper bound, and at 1% significance level, they are on the lower bound of possible Value at Risk movements. Therefore, it is not possible to say they either underestimate or overestimate the given parameter, but the estimation significantly changes depending on the level of confidence.

Taking these results into account, a suggestion can be given to financial institutions to quantify risk using several methods: peaks over thresholds method (the latest approach of extreme value theory), historical evaluation (quantile) – for large samples, and RiskMetrics method (containing econometric method). For the purpose of simplicity, risk estimation can be focused on these three methods as they have been proven to be the best

regarding the range within which real value of VaR parameter can move. As it was said earlier, the real value of this parameter cannot be observed, so it is difficult to single out one estimation method as the best one.

Furthermore, these results refer to Montenegrin stock market, that is small emerging economy and the results obtained in the analysis should be limited on emerging economies and financial markets that are still developing. These markets are characterized by a greater influence of internal trade and high volatility compared to developed countries, so evaluation of VaR with standard methods that assume a normal distribution is much more difficult. Also, the observation period for measuring Value at Risk includes period of financial crisis, so that fact should be taken into account because of possible derogation of parameter results.

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# MERENJE PARAMETRA VREDNOSTI PRI RIZIKU I TEORIJA EKSTREMNIH VREDNOSTI: DOKAZ NA PRIMERU CRNE GORE

*Koncept vrednosti pri riziku je mera koja se sve više koristi za ocenu maksimalnog gubitka finansijske pozicije u određenom vremenskom periodu za datu verovatnoću. Cilj ovog rada je da pokaže najnovije pristupe merenja tržišnog rizika. Konkretno, rad ispituje da li je teorija ekstremnih vrednosti bolja od ekonometrijskog računanja VaR-a na berzanskim tržištima koja su u razvoju kao što je crnogorsko. Rad je motivisan željom da se riziku u Crnoj Gori posveti potrebna pažnja. Analiziran je dnevni prinos izraženo volatilne akcije EPCG (Elektroprivreda Crne Gore) sa Montenegroberze u periodu od januara 2004 do juna 2013. Ovakav uzorak i njegova vremenska dimenzija do sada nije razmatrana empirijski u literaturi. Stoga, neophodno je iskoristiti iskustva razvijenih svetskih finansijskih institucija koje studiozno pristupaju upravljanju rizikom, kao i najnovijih teorijskih znanja.*

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