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Printing 300 copies
Note of the Editor in Chief

Since 2014, journal International Review (IR) has been published in cooperation with Italian publishing house Medimond from Bologna. In the period of just two years, great efforts have been invested in this scientific journal in order to adapt it to the supreme scientific standards of the SCI list and to fulfil the conditions to make it the second journal, in the field of economy, in the country that is indexed on the Thomson Reuters list. Until June or July 2015, three last issues of IR journal will have been indexed on the Thomson Reuters list in the category M23 (4 points).

We appreciate the efforts of all the authors who have sent us quality papers, which passed the peer reviews and were published in our journal. We also expect that in the future we will get original scientific papers of even higher quality and in a larger number. Besides the original papers we welcome the papers from other scientific categories - position papers, letters to editors, book reviews, scientific review papers and scientific criticism.

We want to express our gratitude to the members of the editorial staff and its secretary Sladjana Vujčić and our technical editor Nikola Cogoljević, who have contributed greatly to publishing IR on time and to have it technically prepared to be printed according to the high international standards. In some of the future issues we plan to have guest editors from foreign universities, which will contribute to making this journal even more present in the international scientific community.

I would also like to mention that quoting of the papers from the IR journal is very welcome. Because further progress of the journal, on the SCI list and its categorization, will depend on quoting the papers.

I would like to use this opportunity to remind all potential authors of the papers to have in mind the technical instructions in writing and deadlines for sending the papers in as well. All papers should be sent to the already known e-mail of the editorial office of the journal.

Yours faithfully,

Academician Mirjana Radovic-Markovic

Editor in Chief
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Complementarities Between Microfinance and Job Creation

Grozdanić Radmila¹, Vukosavljević Dejan², Beslać Milan³

Abstract

The objective of this paper was to research the impact of microfinance bank loans on employment generation in Serbia in 2014 with a seasonal dynamics, around which was situated the scope of the paper too as a case study. The hypothesis formulated as possible impact of microfinance bank loans in employment generation was positive. Jobs created were divided into groups of: sustained jobs, indirect, induced, second-order “growth” effects, and net job creation, with multipliers, such as the total number of jobs in an economy generated per one direct job, frequently used to assess and benchmark the job-creation effects of private sector activities. Mathematical and descriptive statistical methods are used, as well as a typical fitting measure, Coefficient of determination, for measure of fitting the trend-line with the empirical data, 88.28% of contribution towards the prediction of created jobs dynamics, and 93.09% of contribution towards the prediction of sustained jobs dynamics.

KEY WORDS: Job creation, Microfinance bank credit, Business-cycle theory
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Introduction

The microfinance institutions with their specific loans and clients provided to, have been blossomed in many countries. There are over 170 million customers whose needs have been satisfied, which number, supported by number of donors, and improving their integration in the developing financial sector and other financial services for self-employment activities is even growing especially after the good experience of Grameen Bank in Bangladesh and Banco Sol in Bolivia.

As valuable research experience about possible micro loans impact on job creation are IFC studies, EBRD study in Poland, Bulgaria, and Romania, evaluations reviewed under investment climate conducted in Brazil, Burkina Faso, Liberia, Mexico, Peru, Portugal, Rwanda, and Sierra Leone. So, the IFC information on direct jobs that were being provided in client companies in 2011 in Ghana, Jordan, Sri Lanka and Tunisia, talks about some of 2.5 million jobs. These direct jobs, judging by the indicator “number of jobs created per million dollar of project costs,” was associated with adding many more direct jobs than similar investment in others (such as heavy industries). Type of jobs created by bank credit were seen as:

- Direct jobs created among farmers employed by agribusiness project
- Indirect jobs created by suppliers and distributors
- Induced jobs created when overall economic activity rises

This study marked also that there were lost jobs too, mainly in competitors companies (Gubert, 2011), IFC provided assistance in strengthening a community development program and supply chain linkages, which most likely helped to bring about these strong results. From the industry sector aspect, such as tourism, only accounting for the direct effects of projects misses their potentially high development impact, including the impact on job creation. A large part of economy-wide job creation associated with investment in hotels happens through indirect job creation in hotels’ suppliers and contractors, job creation due to spending by hotel guests outside the hotel, and hotels attracting business into the area.

EBRD has provided an study on the retail sector in Poland, Bulgaria, and Romania. Main findings on potential job creation were situated in modern retailers and significant job losses in competitors. The study has been provided in 2011.

The FAO study from the United States founded that for every hundred jobs added by introducing modern retail stores, fifty were lost in competing enterprises over the next five years, indicating just half of them as direct job created.

The goal of these studies was to assess the socio-economic impact of IFC’s, EBRD’s financing in these countries. Employment associated with their investments has been one of the parameters evaluated.

Some other evaluations which were reviewed in the Access to Finance area in Bosnia and Herzegovina, Bangladesh, China, Ghana, India, Maldives, Mexico, Mongolia, Morocco, Sri Lanka, and Vietnam, were focused on the provision of loans and adding advisory services to micro, small, and medium enterprises as well as to the households. Main findings show that improving access to finance can help firms expand their operations, which can have further positive effect on the quality and number of jobs created and positive effect on employment generation.
Through quantitative approaches, can be concluded that improving access to finance for micro-enterprises can create jobs both through the establishment of new businesses and through the expansion of already existing ones, what is more evident in rural settings.

Also, investments in the services sector in urban areas and in agriculture in rural areas tend to create the most jobs, in which collective loans are likely to have stronger effects on employment.

**Literature Review**

**Definitions and Relevant Multipliers**

When development finance institutions, policymakers, and business leaders are estimating the job-creation effects of their activities, they must look beyond direct jobs generated. They also should consider:

- indirect jobs,
- induced jobs,
- second-order “growth” effects, and
- net job creation. If an analysis fails to consider indirect jobs created in suppliers and distributors, it likely will underestimate the poverty-reduction effects.

The literature treating the employment effects of credit loans mostly consider further definitions:

- Indirect employment effect is defined as a change in employment in a client’s supply and distribution chain, where the multiplier can be define through a number of jobs created in the economy for each direct job through further formula for Type I:

<table>
<thead>
<tr>
<th># Direct Jobs + # Indirect Jobs</th>
<th># Direct Jobs</th>
</tr>
</thead>
</table>

- Induced employment effect is defined as a change in employment resulting from increased demand associated with extra labor income generated by new jobs, where the multiplier can be define through a number of jobs created in the economy for each direct job through further formula for Type II:

<table>
<thead>
<tr>
<th># Direct Jobs + # Indirect Jobs + ΔInduced Jobs</th>
<th># Direct Jobs</th>
</tr>
</thead>
</table>

- Net job creation: effects accounting for job losses in competitors.

Secondary effects refer to job creation through benefits of improved access to infrastructure, such as access to more reliable power allowing enterprises to produce more, and more efficiently.

Value added refers to wages/salaries plus corporate profits plus taxes.

Multipliers represent a snapshot of an economy at a particular point in time. Multipliers, such as the total number of jobs in an economy generated per one direct job, are frequently used to assess and benchmark the job-creation effects of private sector activities. However, they are highly context specific, rarely based on a counter factual, and vary across industries, within industries across countries, and even within one industry in
the same country. Depending on country, industry, and client characteristics, a range of multipliers should be used, and different methods for their derivation may need to be applied. Here are not included some also important background information and their impact as the pattern of employment growth dependences on the age of companies in the sector, changes in its capital intensity.

**Theories overview**

The paper is based on literature concerning the credit creation theory of banking, the fractional reserve theory and the financial intermediation theory.

The bank newly ‘invented’ the funds by crediting the borrower’s account with a deposit, although no such deposit had taken place – what is in line with the claims of the credit creation theory. According to Fama (1985), banks are different in solving the longstanding puzzle and different from both non-bank financial institutions and corporations. They can individually create money out of nothing. Hahn (1920; 1954; 1963), Halm, (1963), Hesse (2007), Keynes’s works in the several editions of *The Economic Theory of Bank Credit* (Ibid: 224). Bortkiewicz (1921; 1915) Böhm-Bawerk, (1985), on capital theory gave up the basic principle of his business cycle- and employment theory, Among the few economists who recognized the lasting importance of Hahn's *Economic Theory of Bank Credit* for a modern credit theory and monetary theory of business cycles are: Fritz Neumark (1900-91), an “enlightened” Keynesian, and Friedrich Lutz (1959), an “enlightened” monetarist and liberal economist. Lutz made major contributions to the theories of interest, investment, and currency problems. Hahn is in a line with Wicksell (1898), and Schumpeter (1934; 1939), and Keynes (1930; 1936) in emphasizing the importance of credit for a modern economy, (Gubert, Roubaud,2011).

What are the theories behind financial intermediation, banks are playing a dominant role in job creation, economic growth, and managing financial and economic stability of a country. Very often researchers use basic theories on economics (i.e., supply and demand for loanable funds) to explain financial intermediation and microfinance institutions (Grozdanic et al., 2014).

**Qualitative Research**

**Hypotheses and Methodology**

During 2014, Micro finance institution which is the subject of the research presented, approved loans that have helped sustain and create number jobs in Serbia. So the main hypothesis of the research that: Bank loans have positive impact on job creation has been qualitative checked (Grozdanic et al., 2006).

In the research havemeen measured the data on working posts, fokusing on two main indicators: sustained and created jobs, measured at hte level of MFI clinets from all segments, agro, business and population. Data used were:

- In business sector: number of employed, registred and non registred at the start date of the research; number counted as number of susteined jobs;
- number of the planned neq emplyees by the client of the MFI after provided loan; number counted as new created jobs;
— In agro sector: number family members over 15; number counted as new created jobs;
— number of day laborers or seasonal workers which client usually employs over the year; number counted as new created jobs.
— In the sector of population: only loans with the purpose of the added revenue for the household from business or agro activity: includes number of people going to be employed on added activity from the household and external human resources; number is counted as new created jobs;
— If the client apply for new loan the data are created the same as above.

Key Research Findings

In summary results during 2014, MFI has approved loans that have helped sustain 28,720 and create 13,658 jobs in Serbia. Dynamics of the total number of jobs that are sustained and created in such way, observed by months, can be interpreted as a time series shown in Figure 1. As expected, the months with the highest numbers of created and sustained jobs were during March, April, October and November of 2014. These are, as an usually, the months of the highest credit activity. According this, it can be easily notice a typical seasonal dynamics of the number of retained and created jobs. Such dynamics can also be quantitatively expressed, as was shown in Figure 1, where the both of time series approximated by the polynomial trend of 6th degree.

\[
\begin{align*}
\text{Sustained} & : y = 0.1378x^6 - 5.7569x^5 + 90.153x^4 - 643.93x^3 + 1988.7x^2 - 1742.8x + 1615.2 \\ 
R^2 & = 0.9309 \\
\text{Created} & : y = 0.0556x^6 - 2.1055x^5 + 29.689x^4 - 186.97x^3 + 496.2x^2 - 520.79x + 1716.6 \\ 
R^2 & = 0.8828
\end{align*}
\]

Figure 1: Job impact made by OBS loans disbursed during 2014

Source: Research results
Clearly, a high degree of agreement between empirical and fitted values can notice, which can also be expressed quantitatively. For this purpose, as a typical fitting measure, it can be used a well-known *Coefficient of determination* ($R^2$), which represents the relative measure of fitting the trend-line with the empirical data. Therefore, this coefficient represents the level of the explained variability in corresponding theoretical model. In the case of the time series observed above, the estimated value of the coefficients of determination are equal $R^2 = 0.9309$ (Sustained-series) and $R^2 = 0.8828$ (Created-series), respectively. This means that 93.09% of contribution towards in the prediction of sustained jobs dynamics can be explained according the appropriate trend-line. Similarly, the fitted trend-values can explain 88.28% of contribution towards in the prediction of created jobs dynamics.

Nevertheless, due to the mathematical complexity of this kind of quantitative analysis of the impact of the season, we will use some typical statistical indicators. First of all, in order to more detailed statistical analysis of dynamics of both series, denoted as “Sustained” and “Created”, respectively, their typically descriptive statistics are shown in Table 1.

Table 1: Summary statistics of observed data series.

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Sustained</th>
<th>Created</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>1,310</td>
<td>653</td>
</tr>
<tr>
<td>1st Quartile</td>
<td>2,110</td>
<td>854</td>
</tr>
<tr>
<td>Median</td>
<td>2,318</td>
<td>1,129</td>
</tr>
<tr>
<td>Average</td>
<td>2,393</td>
<td>1,138</td>
</tr>
<tr>
<td>3rd Quartile</td>
<td>2,821</td>
<td>1,459</td>
</tr>
<tr>
<td>Max</td>
<td>3,171</td>
<td>1,547</td>
</tr>
<tr>
<td>Total</td>
<td>28,720</td>
<td>13,658</td>
</tr>
<tr>
<td>Stand. Deviation</td>
<td>499.07</td>
<td>331.44</td>
</tr>
<tr>
<td>Coeff. of Variation</td>
<td>20.85%</td>
<td>29.12%</td>
</tr>
</tbody>
</table>

*Source: Research results*

It can be seen, for instance, that minimum value of “Sustained”-series equals 1,310, and it corresponds to the smallest number of retained jobs, were realized in January. On the other hand, the maxima of the sustained jobs, realized in April, equal 3,171. The average of the number of retained jobs is equal (approximately) 2,393, with a total variability of 20.85%. When considered the second, “Created”-series, we have the following conclusions. The minimum of created jobs are realized in Jun, 653 of them only. Conversely, in February the most jobs were created: 1,547. The average of created jobs equals 1,138, as the total variability, expressed as a coefficient of variation, equals 20.85%.

In the following segment of our research, we detailed analyzed the seasonal components of both of observed time series. For this purpose, we used the so-called *Specific Seasonal Indexes*, which are calculated by formula $I_s = (y/\bar{y})(100\%)$. Here, $y$ represents the original empirical values of observed series, while $\bar{y}$ is their average value.

In this way, seasonal index $I_s$ expresses (in percent) the seasonal impact on the time series dynamics in each time level (i.e. the month, in our case). After that, for both time series were constructed the appropriate functions of a linear trend ($\hat{y}_t = ax + b$). As it is well-known, trend-values represent the component of stability of time series, i.e. their expected values if there would be no seasonal (or any other) impact. Finally, using a multiplicative model of the dynamics of time series, we can extrapolate (i.e. make a
forecasting) the dynamics of a time series in the future, according to the formula \( \frac{\hat{y}I_S}{100} \). Note that this expression included, at the same time, a seasonal and trend components, and thus it is possible to predict the "future" dynamic of time series.

<table>
<thead>
<tr>
<th>Time</th>
<th>Sustained</th>
<th>Created</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( y_{2014} )</td>
<td>( I_S )</td>
</tr>
<tr>
<td>Jan</td>
<td>1,310</td>
<td>55%</td>
</tr>
<tr>
<td>Feb</td>
<td>2,177</td>
<td>91%</td>
</tr>
<tr>
<td>Mar</td>
<td>2,871</td>
<td>120%</td>
</tr>
<tr>
<td>Apr</td>
<td>3,171</td>
<td>132%</td>
</tr>
<tr>
<td>May</td>
<td>2,459</td>
<td>103%</td>
</tr>
<tr>
<td>Jun</td>
<td>2,122</td>
<td>89%</td>
</tr>
<tr>
<td>Jul</td>
<td>2,004</td>
<td>84%</td>
</tr>
<tr>
<td>Aug</td>
<td>2,121</td>
<td>89%</td>
</tr>
<tr>
<td>Sep</td>
<td>2,078</td>
<td>87%</td>
</tr>
<tr>
<td>Oct</td>
<td>2,925</td>
<td>122%</td>
</tr>
<tr>
<td>Nov</td>
<td>2,804</td>
<td>117%</td>
</tr>
<tr>
<td>Dec</td>
<td>2,678</td>
<td>112%</td>
</tr>
</tbody>
</table>

Source: Research results

In Table 2, for both series, the above-mentioned procedure of constructing the seasonal indexes, as the extrapolation based on them is shown. The second and fourth column of the Table shows the values of the observed series, while the third and fifth columns show the values of the seasonal indexes \( I_S \). Note that in the period Jan-May, as well as in the last quarter of 2014 there is much pronounced seasonal impact (the values \( I_S > 100 \)).

On the other hand, convincingly smallest value of seasonal index corresponding to January. At last, fourth and the last, seventh columns show the extrapolated values of the sustained and created jobs in 2015. Note that in the case of Sustained-series, a growing trend is obtained. Therefore, we can expect an increase of values of this series in the next year, i.e. we predict an increase the number of jobs retained by OBS loans. On the other hand, in Created-series there has been a slight declining linear trend. Thus, in the coming year can be expected, unfortunately, some reduction of the number of created jobs.

The both trends line, together with the observed, empirical values (solid lines), as well as predicted values (dashed line) are shown graphically in Fig. 2.
Discussion and Conclusions

It would be observed that, despite the presumed developments in the Serbian economy, the country is still largely being regarded as a one in transition, as the industrial growth is not quite impressive with the high unemployment as a main problem.

Because of that the researching this paper is essentially significant as it is directed towards evaluating the impact and role that micro finance banks loans have on the creation of jobs and employment thus stimulating economic growth and development of Serbia, especially the rural area.

Commercial banks lend traditionally to medium and large enterprises which are judged to be credit-worthy, avoiding doing business with the poor and other micro enterprises and households because the associated cost and risks are considered to be relatively high. As rural areas and sell-employment are recognized in Serbia important for sustainable growth and development, what microfinance banks do- with their micro loans – the financial empowerment of these areas, their role can be considered as vital too.

Even more, the new growth strategy of SMEs of Serbia is just to be adapting, with the latent entrepreneurial capabilities of the large segment of the people to be stimulated and sustained, then positive multipliers would be felt through the Serbian economy (Grozdanic et al., 2013).

To give effect to these aspirations various policies have to be instituted over future time by the Government to improve rural enterprise and households production capabilities, in which such research results can be of use and contribute the more positive climate.
References


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Critical Competencies of Virtual Team Members and its Managers for Business Success

Radović Marković Mirjana⁴, Marković Dušan⁵, Radulović Dejan⁶

Abstract

Virtual teams function in the conditions of great insecurities and specific demands of the virtual environment. Therefore, when forming a successful virtual team, special attention should be paid to choosing its members, on whom the efficiency of the project tasks depends to a great extent. The evaluation of competencies has an exceptional significance in assessing the capacities of the employees, their potentials and limitations in order to foresee their individual success or team success. However, the whole concept cannot be imagined without competent managers who manage and develop virtual teams. According to this, the main aim of this paper is to determine the key competencies of members of virtual teams, as well as of their managers which are characterised by success in business operations of virtual organizations. For establishing the key competencies of virtual teams on one hand and the competencies of their managers on the other, we used literature overview as well as the newest researches in this field. In practice we can conclude that competent managers should use a wide range of new, technologically supported options in forming their strategies with the goal of being able to meet and face the changes, instead of just react to them. Also the authors give numerous examples from Europe which show the comparative advantage in implementing the new technologies by the ones who possess IT education, because they accept them as new ideas faster than the others.

KEY WORDS: virtual teams, employees’ competencies, organization, information technologies, managerial information competencies

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Competencies: theoretical framework

“The needs for competencies and qualifications at the level of wider social community (region, entity, state) are not easy to determine and are usually considered to be determined at two levels: at the level of an enterprise and at the national level (or perhaps at regional or sectoral level) “ (Praštalo, 2010,str.21). Competency is capability of a person, which is verified by some written document and relates to the fact that this person is able to work in a certain profession (Pukelis,2009, p. 20). Moreover, competencies show the ability to apply certain knowledge, skills and personal, social and methodological skills, at work (Federal Employment Office, 2011) as well as at personal and professional development. They are related to the demands towards a profession connected to productivity, where competency is defined as a mixture of skills and abilities which are of use with the goal of increase in productivity of an enterprise.

The evaluation of competencies is of exceptional significance in gaining an insight into the capacities of employees, their potentials and limitations, with the goal of precise foreseeing employee’s individual success or team success. This evaluation is done when the project teams for project realization are formed, also in cases of forming the teams and in case of an optimization of organization structure. Goals and work success are not being observed individually as isolated elements of employees’ development system, but they are intertwined and act together in direction of work, professional and personal development of the employees with the support of their leader (Praštalo, 2010).

Necessary competencies for certain kinds of business tasks can be changed depending on the goals of the project as well as the leadership in an organization. That is, organizations can determine which positions and at which level they demand special competencies (Spencer, Watkin, 2006). It is essential to identify the key competencies of the employees in organizations. Key competencies are transferable multifunctional groups of knowledge, skills, talents and attitudes which are necessary to all individuals for their personal realization and development, inclusion in society and employment (Federal Employment Office, 2011). However, before this process a more thorough analysis has to be done, which gives the key notions of society of knowledge (Drucker, 1994a; 1994b). We are talking about productivity of knowledge and knowledge management. Productivity of knowledge is a new phrase which directly speaks about two criteria: innovation and usability. Instead of one type of knowledge we will talk about groups of knowledge, Drucker points out, and the priority is determining what new knowledge will be necessary, whether it is applicable and what should be done for it to become productive (Drucker, 1995). Human resources management, as a business function, unifies jobs and tasks connected to people, their finding, selecting, their education and development (Praštalo, 2010). While selecting the staff, HR experts should consider competencies that an individual possesses and compare them with job requirements. By reviewing the current abilities of staff and comparing them to the necessary skills, organizations can make better decisions while hiring.

Globalization faces the European Union with new challenges, which insist on wide range of knowledge. European Union is making efforts and warns about the importance and the need for life-long learning and it publishes documents which regulate this area. According to this, information and communication technologies are the subject of significant demand for researchers and theoreticians in the last decade. Since the mid-1980s, information technologies have had a growing strategic influence (Bassellier, et al., 2003). Following this trend, theoreticians have focused on integration of IT professionals
and business managers into creating abilities of information technologies and effective usage and implementation in organizations (Bassellier, et al., 2003; Rockart, et al., 1996). Theoreticians of resource theory suggest relevant steps in the area of connecting human factor with information technologies in creating the sustainable comparative advantage of an enterprise at the market (Barney, 1991) (Mata et al., 1995) (Ross et al., 1996).

In some of the most eminent theoretical overviews the special attention is paid to the significance of human capital in creating the sustainable competitive advantage of an enterprise through modern information and communication technologies. Most of the resource theories advocate unification of human resources factors with information technologies in building the sustainable competitive advantage of en enterprise. (Barney, 1991) (Mata et al.,1995; Ross, et al., 1996).

In virtual companies, special role belongs to a global leader who is usually defined as a person who develops business at the foreign market, sets the strategy of business at the global level and manages various global and diffused teams (Brownwell, 2006). Cross-cultural competencies are a complex notion which includes soft and hard skills. Development of such competencies must include an open approach which does not imply imposed system of values and standard solutions, but the development of personal career and a better life for all the hard-working people. Intercultural knowledge influences greatly the development of personal careers in an organization (Praštalo, 2010, p.17).

If modern organizations expect employees to be flexible and offer innovative solutions, that means that education should offer knowledge and skills which enable the young to creatively solve complex problems (Đurišić-Bojanović, 2009b). It is important to mention that during the education process and process of acquiring skills for a profession, person develops his or her abilities in accordance with the standards of that profession.

Large number of competencies can be divided into two types (Radović-Marković, 2011, p.37):

— competencies which can be successfully applied to a large number of tasks (general competencies);
— knowledge, skills or strategies appropriate for an organization which is specific and which demands special adjustments.

New forms of labour, new technologies and new demands which are set for the employees, have led to gradual redefining of education and to directing individuals and education institutions in that direction. The training of human resources for certain jobs is done primarily with the goal of increase in knowledge and competencies of employees, in order to respond to business tasks better (Radović-Marković, 2011, p.39). General competencies have been especially considered in the recent years in education researches (Barth et al, 2007; Canto-Sperber, Dupuy, 2001; Holmes, Hooper, 2000; Bennett and Sur, 1999). One of the most important reasons for the development of these researches is to improve the quality of studies and the level of knowledge which students acquired during attending educational programs in higher education institutions. “The goal, in this case, besides the professional development, is promotion of personality development which enables an individual to deal with complex situations and to make decisions easily”(Barth, Godemann, Rieckmann, Stoltenberg, 2007, p. 421). On the other hand, specific competencies can additionally be classified in those that are directly connected to specificity of an enterprise, special tasks and the one that are connected to economic sectors.

We can expect to find in the future researches that the organizations will pay more and more attention to dimensions of virtuality, organizational culture in virtual organizations, virtual teams and their competencies (Skyrik, 2010).
Virtual teams and e-competencies

By using various measures every enterprise can develop a base of its competencies by gathering of appropriate competencies outside an enterprise, as well as by developing the human resources which are already employed in the organization. These investments will be efficient only if they are used in such a way to aim the market needs. In that sense we use the so-called chain model of competencies, because it directs attention to the activities which enterprises do in order to advance their competencies base in two areas:

1. Development of internal competencies, which represents the measures that a company takes in order to develop and advance the status of the existing competencies of human resources already employed in the company.

2. Gathering the competencies outside a company by buying them as different external competencies which the company lacks, and which are crucial for company’s obtaining of better characteristics.

At the personal level, employees should be educated in the area of information technologies, ready to facilitate introduction of information technologies in daily processes in a company by using their skills, but they should be provided with technological hardware and devices. Knowledge in information technologies refer to the wider knowledge and skills which relate to objects, because in such a way they enable the introduction of information technologies into daily activities and processes of an enterprise (Tippins, Sohi, 2003). IT knowledge, skills and operations can exist in an enterprise only if an enterprise prepares a platform for introducing information technologies. Objects of information technologies refer to availability of hardware, software and human resources – employees and managers. Owning of IT knowledge, operations and objects guarantees the readiness of an enterprise to gain, apply and realize integral functional influence of information technologies in cooperation with other resources and as a support to business processes in creating additional value (Bessant, et al., 2001).

Some authors consider experience as an integral part of IT competencies along with the education (Rockart, et al., 1996), (Bassellier, et al., 2003). Experience in applying information technologies refers to the activities which an enterprise undertook in the field of IT projects and the experience in managing these projects. According to the numerous papers of many authors, experience which refers to competencies (Tippins, Sohi, 2003) will probably influence the acquiring of IT skills, as well as the advancement of competencies and resources for the future work of employees and an enterprise. That is why it is expected for the experience in information technologies to support the ICT knowledge and increase the readiness of an employee to efficiently introduce information technologies on the one hand, and readiness of management to increase the investments in tools and ICT equipment on the other hand (Foss, Knudsen, 2000). Discussions on the best practice in education and training for acquiring IT knowledge point out that they are the precondition for building individual and team competencies in that area.

The next framework of resources theory insists on (Lockett,Thompson, 2004) enterprise, with the intention of realizing its goals at the market, especially international, having to possess resources that are: valuable, rare and difficult for imitation and replacement (Barney, 1991), in order to put a barrier for the competitors. IT skills and the will of employees to use ICT devices and tools can create new special values in an enterprise. Extremely important are managerial skills in information technologies (Rockart, et al., 1996), if we consider that these skills can potentially influence the increase in competitiveness of an enterprise. In the industry-related studies it is pointed out that the sector of ICT users, which comprises industries and intensive users of information and communication technologies, own much more competencies in comparison with those
industries in which ICT technologies are not used. Studies, conducted in the USA, Australia and Great Britain show that the enterprises and service activities connected to them, where modern ICT technologies systems and tools are intensely implemented, have significantly higher productivity from those who do not use ICT (OECD, 2010). European Union also marks higher growth in productivity with enterprises which use information technologies intensely in business operations.

Abilities demanded in enterprises which use information technologies intensely imply:

a) research activities,

b) development,

c) design,

d) strategic planning and

e) maintenance

These activities are unimaginable without greater support of an individual, employee and manager. Generally speaking, this can be counted as “computer literacy”, which implies using the information technologies while working, relaxing, studying and communicating. From the point of view of labour force, the users of information and communication technologies apply the systems and tools as a support to their work. Skills of ICT users imply: using the tools of the general software and specific software supporting business functions of an enterprise. The skills of electronic business or leader electronic skills, imply abilities necessary to use possibilities enabled by the ICT, Internet and other more efficient and effective performances in various types and sizes of enterprises.

The starting point of every virtual organization is a specific task or a product whose solution demands the combination of certain means from the net, which is the basis of some virtual organization. Usually the completion of every task demands using only a specific part of the net. Once configured, every participant of such an organization contributes to solving the problems within the framework of his own competencies and qualities.

**Figure 1: Pyramid of basic skills**

**TGE (Talents of general education)**
Talents of general professional knowledge, able to innovate, lead virtual teams and new ideas teams, and consider climate changes and multicultural environment.

**PS (Professional skills)**
Professional skills demanded by the labour market for a specific sector, like software architecture and horizontal inter sectoral skills, like bookkeeping, law…

**Literacy (basic skills)**
Skills necessary for social inclusion, literacy, basic disciplinary scientific and mathematic knowledge like communications, language etc.

*Source: INSEAD, 2009 and McCormack, 2010.*
Here we think of using possibilities of new ways of doing business, administrative and organizational processes, as well as founding new companies. The following chart gives and overview of the basic skills according to the European Union definition.

**Source: Authors**

European framework of e-competencies (e-CF) is the contribution to the growing significance of information and communication technologies (ICT) at the global level, as well as the great potential of this sector in creating the employment policy. This is a general framework which enables ICT professionals to describe and develop their own abilities, and to the enterprises and its employees to identify the ones who possess the desired skills or who can advance their skills. European e-competence framework provides the description of professional skills for using the ICT, general framework of competencies and the level of understandable ones in Europe and internationally usable ones. This framework is made for implementation in enterprises, to be used by the users or suppliers of ICT and hardware services, managers and HR departments, educational institutions and training bodies, as well as other organizations in private and public sectors. E-CF is developed in 2008 through the process of cooperation between experts and interest groups from various countries. The application of European framework of e-competencies can be useful to a growing number of those who want to implement it in their business practice.

The experience in using e-CF in numerous applications shows the quality tool which facilitates processes connected to ICT competencies, qualifications and human resources development.

Majority of researchers agree that e-skills are becoming more and more important for advancement of competitiveness, productivity and innovation, as well as for employing the labour force and its professionalization. In that sense, there is a great need for ensuring the knowledge, skills and competencies of managers and IT specialists in that area, but also the users, in order to be able to fulfil highest global standards, which are continually being advanced through the process of effective life-long learning.
IT competencies of managers

More severe competition and globalization have put innovation in the spotlight of industrial development. The lack of capacities for a successful risks management endangers especially small enterprises. Model of IT competencies of managers has two dimensions: knowledge and experience. The role of an entrepreneur in companies, especially the small ones (0–49 employees), which are in majority, is described in literature as leading, managerial and coordinating, but also as entrepreneurial, as taking over the new combinations and responsibilities, risks and innovation, with the goal of realizing the strategic goals of companies (Drucker, 1999).

![IT competencies of managers](image)

*Source: Authors*

Managerial information competencies always include the following areas of IT competencies: technology, engineering and management, intellect and learning. Managers, creative leaders, can use a wide range of new, technologically supported options in formulating their strategies, which they use in business activities in order to encounter changes and not just react to them. That is why, before the IT functions get from the operators to business, it is necessary to create the internal abilities of managers and the atmosphere for permanent learning in order to expand innovative abilities in business by using the IT tools (Bessant et al., 2001), (Barrios, 2007)

Model for creating connections between ICT resources and processes is given in several stages:

- Readiness – stage of preparation of technical, trade and social infrastructure for a certain ICT initiative of electronic trade.
- Intensity – state and stage of using e-trade scope, value and nature of transactions. It shows who and to what extent uses e-trade, leading sectors and applications.
- Influence – shows the changes in behaviour of using certain ICT project, applications in e-trade, as well as the results, specific expenses and benefits from ICT projects. It also shows added value created by using e-trade.
Conclusion

Analysing the virtual teams, we can identify main reasons for the increase in virtual team work and using the Internet technologies in organizations. First of all, the appearance of virtual teams represents an answer to various challenges that 21st century organizations face. The appearance of virtual teams was determined by fast changes in business environment, market globalization, as well as the increase in possibilities of inter-organizational cooperation. That affected the forming of various forms of organizational structure as well as the appearance of new work tasks, which demand new knowledge and competencies of employees and managers. Problems in many cases come as a consequence of inconsistency of the conditions for achieving success and current possibilities of an organization. This means the lack of necessary skills of employees and managers in some virtual organization.

For determining the key competencies of virtual teams on one hand and competencies of their managers on the other, this paper used literature overview as well as the newest researches in this field. We came to a conclusion that there is a correlation between various different kinds of changes in organizations and changes which happened by using the electronic functions of an enterprise. Numerous cases in Europe show the comparative advantage in implementation of new technologies by the employees with IT education, because they adopt them as new ideas faster than the others. Also, very high obstacles set for the SMEs’ entering some new market have been facilitated by greater usage of ICT technologies, because in that way the expenses are reduced, productivity and profitability are increased and labour force is additionally motivated to learn and increase the competencies at work.

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Determining Program Management Informational System in New Products

Introduction

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Abstract

The paper considers organizations that plan new product introduction in their production program by program management implementation. It analyses the most frequently used software structure for program management, as well as the structure of the most frequently used informational systems for production management. With the help of subjective and objective analyses, the needs for new methods are perceived and new informational system model and its implementation are defined.

KEY WORDS: Programs, Projects, Program management, Informational system, New products, Production management system

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Introduction

In a project-oriented enterprise, the task of program management informational system (IS) is to link the projects into the program and to provide the base and support to program management of the enterprise. The implementation of program management IS implies determination of the project methodology uniformity, of procedures, software, but also of management, organization and culture (Gariess, 2000).

Software products used in project management mostly address the issue of managing one project. Recently, there have been more and more product management software products, but there are no solutions that fully cover the complete program management issue.

Program management informational system is based on mutual structure that it shares with appropriate data bases used by different parts of integrated IS in relation to requests for individual processing. Program management IS can be used in different areas, for example Choi and Kim (2012) give use program management IS for managing urban renewals.

Program management IS should provide the flow of information on the project and program levels, as well as its flow between projects and functional units. That means that information must be enabled and visible from both project and functional units’ and enterprise levels. This system should enable all the participants in project realisation – project team members, project managers, program managers, project sponsors, functional departments and top management the basis for efficient communication, data exchange, decision making, planning, monitoring and control of projects and programs to certain extent (Ćebić, 2006). If we analyse program management in new product introduction, we will see that such a program encompasses (Reiss, 2000):

— Design and construction
— Development and testing of prototypes and pilot projects
— Pre-production modifications to the manufacturing plant
— Working on the marketing and distribution of a number of new products or a complex product.

It is obvious that there is no conflict between the production management system and program management. In any case, program management will be helpful in the research and development phase if we try to launch new products, but there are also production management systems that will help us to efficiently produce new products.

It can be seen that program management will help managing all developing projects through the stages of comparative techniques, stages of production through prototypes and pilot projects, through market testing stage and JIT manufacturing. That is why there is no conflict between project and program management and systems for production management (Reiss, Rayner, 2001).

In any case, program management will be helpful in the phase of research and the phase of development if we are trying to launch new products in a market, but there is also a system for production management that will help to efficiently produce new products.

The business of manufacturing enterprises is done in the conditions of nondeterministic state, i.e. for most events may be said to have a stochastic character. Manufacturing system is complex because it has stochastic behaviour in its structure (Van Rensburg, 2012). Some of the parameters can stay constant for the whole planned period, while in others there can be expected
or accidental changes. This does not mean that in the future events will unfold as in the past, and consequently, the behaviour of parameters will change. The longer planning horizon is, the greater the uncertainty, especially in an unstable market.

**Subjective Analysis**

In order to define product management informational system model in introducing new products it is first necessary to determine, with the help of subjective and objective analyses, the real needs arising from the demands of the perpetrator working on the project and then do other research and analysis.

In order to realize what your colleagues think about the way the projects are done you can do a research. This research should help people to better take into account the need for new methods, as indeed they may be included in this study. The proposed questions can be the following:

1. Name of the interviewee,
2. Status of the interviewee,
3. Short description of the position,
4. How many projects are you usually included in as a part of a project management team?
5. How many projects are you usually included in as a resource?
6. How do the projects go when it comes to time?
7. How do the projects go when it comes to the budget?
8. How do the projects go when it comes to meeting needs?
9. Do you think that you know the aim of each project?
10. How well do the projects meet their goals?
11. How efficient is the company when using its goals?
12. How well do you understand the priority between projects?
13. Would you be satisfied to know the current state of a project in terms of plan, budget and progress?
14. Which part of project management would you like to be improved?
15. Does any particular group have problems with the project workload?
16. Does the project workload influence non-project workload?
17. How much time do you spend looking for and negotiating resources?
18. How much time do you spend on cooperation within interdependent projects?
19. How much time was lost due to failure to determine the interdependence?

This questionnaire is part of an interview composed especially for indirect observation. This type of interview was considered to be very useful when testing several hypotheses by Stoer and Nett that wrote about that in 1968. Effective interview requests good interviewing skills and techniques and includes planning, guide preparation, selection the people to interview, scheduling, choose of location, inviting the interviewees, appearance in the interview, recording, appropriate interviewing and interview follow-up (Harrington, 1991).
This is one of the ways to get a statistical analysis of subjective ideas regarding people’s opinions long before program management system appeared. You can use this type of analysis or a part of the analysis as the support to investment in program management, but keep these data for later.

**Objective Analysis**

This analysis should be done on the basis of specific issues. The question is whether you can come to hard data. Maybe you have the access to old projects’ files so that you can get the idea of original goals (delivery dates, budgets) and real achievements. That can point to worrying trends and can provide you with a lot of hard evidence to prove that it is possible to work more efficiently and better (Reiss, 2000).

You may be able to determine the costs of the company due to the inefficiency and loss of work due to overloaded projects and too much money spent. What about delayed projects? Usually there is a secret space where stories about projects that are abandoned are stored and gather dust.

Such an analysis should be done very carefully. Maybe, it would be wise to avoid mentioning certain projects, since that might upset some powerful people, and to do an unbiased mathematical analysis of many projects.

That way, based on a mixture of subjective and objective analyses, you will come up with new data. This will:

1. Help your case for program management system;
2. Become very appropriate later.

When do you think this information will be useful? A little bit later, as soon as the system is rebooted and starts to work and most, if not all, the work is in the system and when the attitude and morale are reasonably high, you simply repeat the process. Repeat these questions, examine recent projects and make even better graphics and three-dimensional circular tables showing how things have improved.

You can show the benefits the best you can, equipped with statistics and impressions to show that the savings due to increased efficiency are greater than the cost of the system.

**Informational System Model for Program Management in New Products Introduction**

Work approach on the base of the project involves creating an integrated IS with a unique database of the company. This base should be formed in compliance with the project way of work and provide work support to all the modules for program management IS. The base should provide the basis for linking projects, activities on the level of projects and programs on the level of enterprise (Clark, 2000).

Integrated IS of project-oriented enterprises that are engaged in the production of new products should also consist of two parts:

1. IS on the level of an enterprise
2. IS of the specific program (new products).
The first part refers to the IS of project-oriented companies. IS of project-oriented enterprise should provide necessary input data and during the implementation of projects constantly provide help in the realization of the project. Within IS on the enterprise level, the data that should be on disposal of different users on a project are centralised (Hallows, 1998). The other part is information system of a specific program which is designed based on the characteristics and specific features of the project within the program.

When making IS for new products introduction managing program it is necessary to start from the specific features of the project and their interdependence.

Program management of new products is used and encompasses the following phases:

- Design and construction
- Development and testing of prototypes and pilot projects
- Pre-production modifications of the manufacturing plant
- Working on the marketing and new product distribution.

When previous activities are over, we can refer to the control tools, such as MRP and JIT. Obviously, there is no clash between program management and production management systems. In any case, program management is helpful in the phase of research and development if we try to bring new products to market, but there are also production management systems that will allow us to efficiently produce new products.

IS for new products introduction managing program should be:

- Structured in the way that the content of its modules encompasses the whole issue of program management,
- Based on the main precondition for its operation and that is an adequate production organization on the basis of projects,
- Integrated in such a way to connect program management with IS for production management (IS for production management should be with the requirements of production on a project basis).

Thus, based on the analysis and specific characteristics of the project and program, the analysis and specific characteristics of existing systems for production management, the analysis and specific characteristics of the project management systems it is necessary to define integrated IS for program management of project-oriented enterprise (Čebić, 2006).

### Informational system for new products at the enterprise level

IS for new products introduction managing program at the enterprise level should include the following modules:

- Project portfolio management,
- Recruiting and human resources management,
- Provision and management of materials,
- Market and sales analyses of completed projects,
- Financial operations
- Risk management.

**Project portfolio management.** Project portfolio in a project-oriented enterprise is considered as a set of projects that an enterprise realises in a certain period of time. This includes
research projects, development projects, products and services improvement projects, process improvement projects, cost reduction projects, projects for customers, etc. (Gariess, 2000).

This module should refer to strategic management of an enterprise through the project portfolio.

Within this module it is necessary to conduct a general harmonization of projects and programs with the strategy of the enterprise, select programs and projects to be implemented, set priorities in the implementation and terminate or suspend the programs. This module should assist in risk assessment and monitoring, events and changes, to support decision-making within the programs and projects portfolio, to analyze the results of the projects and assist in the resolution of conflicts.

One of the best financial models that can also be implemented for the proper management of the project portfolio is the method of “Expected commercial value.”

This method aims at the maximisation of the commercial project portfolio value in compliance with defined budget limitations.

ECV (Expected commercial value) method determines the commercial value of each project in an enterprise (Cooper, et al., 1998). Calculation is based on the analysis of the decision tree and contains the future course of effects of the project, the likelihood of commercial and technical success of the project, the costs of commercialisation and development costs. This approach also includes strategic importance of a project.

\[
ECV = (NCV \times Csp \times SI - CC) \times Tsp - DC
\]

ECV - Expected commercial value of a project
SI - Strategic importance of a project
Tsp – Technical success probability
Csp - Commercial success probability (for given technical success)
DC – Development costs attributable to the project
CC- Costs of commercialisation
NCV – Net current value

In order to get the prioritised list of projects it is necessary to consider limited resources. Capital resources, the number of engaged people, monthly engagement, financial means, etc. can be considered as limited resources. In order to get the final ranking of the projects it is needed to divide what is supposed to be maximized, in this case ECV, by limited resources. If the costs per project are taken as limited resources we will get a relative ratio of ECV and costs and this ratio will be used to establish the ranking list of projects. Projects with higher ratio have higher priority for realisation.

**Recruiting and human resource management.** Within this module it is necessary to make optimal allocation of critical resources so that their time can be used in the best way and be optimized. Resources are reserved on the basis of priorities that are derived from the program plan. This module should be updated and supply program and project managers with the information regarding availability of specific resources.

**Provision and management of materials.** This module contains the database of materials that is used for product realisation, data on subcontractors and suppliers with price lists, purchasing conditions and delivery possibilities, outturn for specific jobs, customs regulations, production standards and regulations. This module should provide the optimality of management by providing materials and their distribution according to the project plan.
Market and sales analyses of completed projects. Within this module it is needed to summarize historical data on realised sales. The module of sales analysis should summarize all the enquiries and to compare them with the realisation of signed contracts. An enquiry is a document which shows the interest of a buyer for a product and which contains the requirements of the buyer. An offer is a document which contains basic elements with the response of the sales service to the request.

Based on the above, it is necessary to conduct follow-up of enquiries and offers and based on that get the statistical data on the interest of customers in a certain product groups, as well as the statistics of the contracts by offers.

When making offers, beside database made on the basis of market research, other bases with the data concerning realised projects are used, as well as other available databases for easier, faster, more accurate and wider realisation of possibilities and reserves for obtaining specific offers (Čebić, 2005).

As for new products introduction, within this analysis, in very competitive markets with more demanding customers, it is particularly important to satisfy consumers’ needs. It is necessary for a producer to realise on the basis of which if a buyer make the purchase decision.

In the earliest stages of new product development many options are open and the degree of freedom is high. With each decision and after every phase, the degree of freedom is reduced and product characteristics are more detailed. Due to this it is very important to consider consumers’ needs and expectations since the earliest phase. Market research has that task – to provide an insight into a market, as well as into consumers’ wishes and needs.

Market research in the earliest stages of product development process appears in two forms (Figure 1): 1) Determining consumer preferences by product characteristics, as well as the product as a whole, but also measuring the sensitivity of these characteristics; 2) Simulation of market conditions to predict potential market share and define such a product that will achieve competitive advantage.

![Market research, chronologically, by program management phases in the process of new product introduction](image)

**Source:** Authors
Financial operations. This module’s task is to monitor program income and expenses of individual projects and the enterprise as a whole in an organized way. This module is supposed to include all financial and accounting operations of an enterprise.

Risk management. The module should provide help and support to project manager in managing all unplanned events that occur in the course of the project. The module should enable the project manager and project team to identify unplanned event in an easier way, to define it, quantify it, formulate the plan of reaction to it and set priorities. When it comes to risk, the module should provide assistance in managing risk through the following sub-processes (Jovanović, 2004):

- Risk identification and determining the main cause of risk
- Analysis and risk assessment (probability of occurrence and determining the risk owner)
- Risk response plan
- Monitoring the risk response.

The informational system enterprise within the integral IS, should provide assistance for faster and more efficient project work. Its assistance in project realisation is in form of providing input.

The IS of an enterprise should provide the acceptance of data arising from the IS program and project and establish fast communication with all the participants in the projects. The data needed by experts-participants are available in a certain way, i.e. a certain system of assess to data is made in accordance with the roles of external participants in project realisation.

IS of new product programs and projects

The IS of programs and projects should correspond to the company IS. Defining project IS should be done in the phase of preparation of the project and project manager is responsible for its realisation. Project informational system is defined and formed according to the analysis and specific characteristics of the project, based on the perceived capabilities of existing software for project management, as well as on specific characteristics of the company IS. Forming starts by defining the conditions and needs for project IS.

Project IS should cover the following areas:

- Defining and producing technical documentation of the project
- Planning monitoring and project control
- Program management system
- Warehousing
- Staff record
- Project financial operations.

Defining and producing technical documentation of the project. This module should provide efficient and quality defining and production of complete technical documentation. The module should provide assistance in the preparation of structural, technical, managerial, accounting and other documentation. This part of IS uses the bases of materials, standard and special tools, equipment, spare parts, etc. The module takes the data from the company IS (Runić, 1987).
**Planning monitoring and project control.** This module’s task is to produce appropriate plans of individual projects. The plan should include time, resource and cost plans. Within this module monitoring the realization of the project is done through the recording and entering progress of implementation of all three categories of the plan. Based on input, control of project realization is done by comparing planned and actual parameters. Project control should point out the discrepancies that may jeopardize the planned project so that corrective actions are taken on time (Kerzner, 2003).

Within this module report matrix and report distribution matrix are defined. According to these, the reports of the time, resource and cost monitoring of the projects, as well as the frequency of reporting are specified.

Project plan is defined according to program plan as an activity or as a number of activities defined by certain wholes. Project plans should be in compliance with the program aim and with four elements that define the project.

This module should enable project manager and other participants in the project to realise their plans in compliance with program plan in more efficient way.

**Program management system.** This module, comparing to the 4 elements that define the program, reconciles individual projects in relation to the objectives of the program. The reconciliation is done in relation to the scope, time of implementation, budget, and program quality (CCTA, 1994).

This module’s task is:

— To transfer plans of individual projects to a central point
— To consolidate individual plans. Consolidation is a process of combining individual project plans into a program plan. The planning program process through the consolidation model is realised according to the process flow diagram (Figure 1)
— To discover conflicts and problems between projects, especially when it comes to resources
— To initiate and modify individual project plans based on priorities and to transmit it to the module for planning, monitoring and project control (Turner, et al., 1994).

On the basis of previously implemented activities, this module has a further role to perform summarization of the progress of the program. Based on taking updated data from individual IS projects, the module controls the realization in terms of time, resource and financial parameters, comparing them with the planned figures. In this way, a global view of the individual projects is made, as well as the total overview of all the projects against defined criteria.

The results of processed data are obtained through a series of pre-defined reports for specific functions in an enterprise.
Planning process is realised (Figure 2) through three paths. The middle path shows the process of preparation numerous individual project plans and transfer of these plans towards the central part where these individual plans are consolidated in a program plan.

Consolidated plans now create a program plan. Usually, this phase is followed by the evaluation and experimentation process. During this phase, alternative solutions for program plan are considered and discussed.

When decisions are made and good program is prepared, the plan is forwarded to the managers of individual projects.

It is likely that this plan will include the plans of individual projects and their workload. That is the reason why the chosen plan is forwarded to those who are responsible for work and maintaining plans of individual projects. Individual project plans are modernized in order to be adjusted to a program plan.

Giving instructions to those who are responsible for work is allowed in individual plans. That leads to real success.

Measuring success is achieved through means which allow the response to individual project plans or consolidated program plan.

Beside individual project plans and measuring success, other factors can affect the consolidation process change, so that they have to be taken into consideration. The change of project workload – new terminated or cancelled projects – affect the importance of individual project plans. The change of environment can change individual project priority. These factors are taken into consideration before the phase of experimenting and decision-making.
**Warehousing.** This module should enable successful implementation of warehouse operations in accordance with the released work orders and on the basis of reserved materials, tools, equipment, etc. The module should enable efficient recording, preparation, storing and releasing materials, tools, etc. It should also enable spotting procurement errors or those related to stored material, standard tools, etc. (Slack et al., 1995).

**Staff record.** Within this module it is necessary to carry out activities regarding employees that are included in the project. All necessary information is recorded and updated, such as personal data, information about the skills and abilities, the results achieved, etc. Staff record is kept at the enterprise level and at the level of subcontractors.

**Project Financial operations.** This module’s task is to encompass the records of all the claims and payments between participants in the project. Within the module, the following are processed: monthly situations, salaries, cash management, etc. The module is closely connected with financial operations of an enterprise and forwards accounting data related to the project with the calculations of project income and expenditure.

### Software Implementation

No software, including program management software, will have expected results without the adequate system of its implementation. Many people think that they will improve their project management by purchasing software and decide to buy one. By purchasing the software, they ignore the necessity of designing the program management system in the enterprise.

Unknowing the concept of project management prevents the implementation of these software packages and they are often discredited as useless elements. Purchasing software is a part of the procedure of program management concept introduction and improvement in a company. If there is no previously defined system of project management in an enterprise or there is no study of business development or improvement in it, we do not know the possible role of software or whether it is compatible with the way of work and operation of the enterprise and the system of project management (Reiss, 2000).

According to Reiss (2000), in order to use appropriate software in distributive network of computers and terminals (integrated multy-project system – multy-user licence), the implementation of software should be done in six phases.

**First phase:** authority. A person or team responsible for software introduction must have the authority to make this system work. Mainly working group that includes people who will actually use the software investigates the matter and if they have the authority make a decision on the introduction of the software.

**Second phase:** approach. The first task of a working group should be the assessment of possible approaches. Here, the question is not about resources, but about the approach and strategy. It is necessary to think about the approaches, strategies and the way the system can and is allowed to work. It is a priority to choose the best system for your organistaion. Then, in the end, choose software as the system support.

**Third phase:** software purchase. When purchasing software, current organizations increasingly formalize this process. Software should have necessary functionality. It has to define a number of tasks that should be performed in a number of projects, a number of resources, users, calendars and other lists of specific characteristics. The reliability of
software house is an important factor when dealing with this system. Through the tender process you will receive offers - prices and control the software. And after all, you will make a choice - a system or a combination of systems. It is normal that some time before the selection you decide which support team you will employ to take care of this system. By creating an internal team whose members are the only ones that will manage the operation supporter – user it is possible to reduce costs substantially.

**Fourth phase:** software installing. This phase will be completed by the supplier since you included the installing phase into the offer except that you have (or you are a part) of a group of people that is familiar with it. You will get professional help in system installing in your network or mini-computer system. This phase requests time and money, but you can expect the feedback on the system once it is installed. The support team can benefit from monitoring the process and learning about the way the system works.

**Fifth phase:** taking-up workload. In this phase, it is expected that idleness will stop and that all the new projects will be included in new system allowing ongoing projects to be completed under the old regime before they become obsolete. That is very delicate, since new system workload gradually increases while new projects take place. New projects follow corporative direction and methodology and they are usable in the new system. Nobody overloads new system. In the beginning, there will be not many benefits. That is a test time for everyone. Problems with software may occur, or even worse, the problems with hardware and there is a danger that many will give up and let go of the whole thing just when the gains are about to appear. It is necessary to possess certain qualities in order to pass this phase.

**Sixth phase:** gains. Once the system is installed and starts working how you expect that there will be fewer problems, panic and the job will be much easier to develop. When new process starts to run and the work is done in much easier way, none will remember issues that occurred before. That is why it is better to review the enterprise before you install program - management system.

According McCarty (2013) the implementation program management software can be improved through effective employee and end-user training. By increasing stakeholder awareness surrounding this IS, organizations can observe increased use of the toolset, increased adoption of more features provided by the tool, speed-up of implementation and decreased resistance. The benefits of mastering implementation can ensure both tangible and intangible value to organizations.
Conclusion

In recent times, the upcoming changes of the new forms of business have been increasingly analysed. Changes in enterprises are gradual and it can be said that they present a continual process. Defining works on the basis of projects and their connecting on the basis of mutual project aim brings important improvements relating functional work flows.

In order to realize such defined and connected projects, one of the pre-conditions is the implementation of program management informational system.

Introduction of this work defines conditions and informational system structure for managing new product introduction program.

Part 2 defines subjective analysis which determines the progress of the projects. These examinations should help people to better take into account the need for new methods (what the software should contain).

Part 3 defines objective analysis based on specific issues that should be implemented to demonstrate the benefits of the new information system.

Part 4 defines IS model for program management in new product introduction. This IS of the project-oriented enterprise that deals with new product introduction should include two parts: (1) IS at the enterprise level, (2) IS of the specific program (new products).

IS for new products at the enterprise level should contain the following modules:
- Market and sales analyses of completed projects,
- Project portfolio management,
- Recruiting and human resources management,
- Provision and management of materials,
- Change and risk management
- Financial operations.

IS of programs and projects should cover the following areas:
- Defining and producing technical documentation of the project
- Planning monitoring and project control
- Program management system
- Warehousing
- Staff record
- Project financial operations.

Part 5 defines the procedure of implementation, as well as the implementation of new IS that is done in six phases.

On the basis of the research and recommendations from this work we can conclude that the concept of integrated IS enterprise that wants to function on the basis of projects and which deals with implementation and new product production to follow the structure of the organization and is derived from the requirements of the organisation is defined.
References


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Innovative ICT Tools and Team Work in the Elder People Wealth

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Abstract

The qualitative research presented in this paper would like to support social care activities of old generation with ICT-enabled solutions. The objective of this research is to study the satisfaction of team learning of older people using ICT technologies as innovative method and tools in an individual development for cognitive capabilities efficacy. The target group of this research was 90 aged people older than 65, having been chosen for individual development of capabilities efficacy training at Stari Grad Municipality’s Social Protection Department, Belgrade, Serbia in 2014. The data was collected by using the questionnaire asking about the personal information, learning satisfaction on the group activities, and group team leader, and the learning outcomes of the training concerning their cognitive skills improvement, and used innovative communication and information technology. The main tool for improving their communication and cognitive skills was touching screen and ICT technologies hardware and software instruments. The data analysis was done by using a statistical program consisted of percentage, mean, standard deviation, Pearson’s Product Moment Correlation Coefficient and Multiple Regression Analysis. The finding showed that the older populations’ satisfaction towards the innovative team method and ICT technology tools was in the highest level. There were the positive relationships between the learning method and tools satisfaction and the learning outcomes. The main contribution of the research realized and presented in the paper is very high satisfaction of the older population with innovative tools of ICT technologies and communication introduces and used in the training, as well as wishes to continue the communication with computer, usage of various software and means in their future life.

**KEY WORDS:** Demographics, Older population, Innovative Team Mental Training, ICT tools

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Introduction

Demographic changes are more and more focused on senior citizens. The ageing population in Serbia, and around the Europe rises and brings serious concerns about resources, demands on health provision and pensions (Blaschke et al., 2009). Stereotypes about old age are evident (Evans et al., 2003), like - dependent population, with neglected competencies and the image of being immobile, inflexible, weak and hardly loadable demanding expense factor (Findsen, 2007). According to the Commission of the European Communities (2007), effective and equal access to lifelong learning, social and healthcare services varies across the EU, with a significant share of the EU population experiencing poverty and social exclusion and facing severe difficulties in achieving a decent living EURAG (2005), Charter for the Elderly, declaration of the rights and responsibilities of older persons, Ljubljana. European Centre for Social Welfare Policy and Research, Vienna in its study finds a number of senior citizens are affected by the risk of poverty (European Centre, 2006). Social exclusion is more connected with old-age dependency, decreasing cognitive functions than to be a matter of income and property, as according the study, more than 28% of the population over 70 currently lives alone.

According to the Green Book of the EU-Commission, a lack of solidarity with the „old elderly“ (Brussels, 2005) is trying to be overcome by maximizing the „productivity of old age“ by integrating their skills into more qualitative personal life and in society is the magic formula for a productive managing of these demographic changes (Obijiofor et al., 2007).

The reaction of some country to the ongoing demographic changes puts the focus on the active citizenship of senior citizens and developed useful instruments for their active participation in the personal and public life.

These are at the same time the challenges of and Information and Communication Technologies (ICTs) impact. ICT as innovative technologies and digital-age tools can be proposed as possible resources to improve outcomes, quality of life, extend length of community residence, improve physical and mental health status of elder population, and reduce family and care-giver burden (Radovic et al., 2014).

The usage of innovative ICT technologies for ageing well in the information society is in its nascent phase. ICT tools as touch screen and other do not jet fully ensure the availability and take-up of the necessary ICT-enabled solutions. Also, innovative methods of Human resource management in education as team work and learning are, are not often in the practice in aged communication and cognitive functions improvement.

The goal of this paper is because of above mentioned trends and issues to separate the evidence base for these claims from simple optimism about the ultimate value of technology-based tools. This is accomplished through an extensive examination of the empirical research literature in the field of ICTs relating to ageing populations. In this paper, is described how these technologies and team work are being utilized by older adults and effectiveness and limitations of the technologies. This paper will thus consider the implications of current research knowledge for social work practice, education and research (Jevtic et al., 2014).
Qualitative Research

**Scope and Methodology**

This is a Survey Research aiming to incite the relationship between the learning satisfaction and the learning outcomes, as well as to study the predictive power of the learning satisfaction of team work which affects the learning outcomes. This research was conducted using the below methodologies.

**The population and sampling group** in this research are 90 elder people, 90 participants as part of the ongoing project I DO NO FALL, in the participating City Municipality Stari Grad, Belgrade from 65 to over 80 years old. who enrolled in Individual Development for training.

Thai Qualifications Framework for IT training of elder people, groups the kinds of learning expected of participants into two domains: Interpersonal Skills and Responsibility: the ability to work effectively in a group and exercise leadership while also accepts personal and social responsibility, as well as the ability to plan and take responsibility of their own learning; Communication and Information Technology Skills: the ability to use information and communications technology effectively.

**Research Objectives** were to: to study the satisfaction of learning and the learning outcomes of the training named Individual Development for Work quality of life by team and IT tools; to study the relationship between the learning satisfaction and the learning outcomes and to examine the prediction of learning satisfaction in each aspect which affects the learning outcomes.

**The research tool** used was a questionnaire, designed by the researchers (authors of the paper). The questionnaire is the check list that asks, in the Section 1: for general information including gender, year, and income status. This section collects basic information that will help to understand the research conducted better but will not be used in the analysis with other variables; Section 2: this part of the questionnaire asks the sampling group to evaluate satisfaction in studying in each aspect of the course ranging from 5 scales: very much, much, normal, less, and minimal. This section consists of questions: about group evaluation, about the team leader; communication and information technology tools used. Section 3: this part queries on learning outcomes from the Individual Development for live efficacy training.

The questionnaire designed for this research is tested by using the method of Item - Total Correlation. The analysis determine the relationship between the score of each item and the total score of the questionnaire using the Pearson's Product Moment Correlation Coefficient by selecting items with discrimination from 0.3 to be used to analyze the Reliability of the each aspect of the questionnaire in order to find the Cronbach's Alpha Coefficient. This research data was analyzed using Frequency, Percentage, Mean, Standard Deviation, Pearson's Product Moment Correlation Coefficient, and Multiple Regression Analysis.
Key Findings

General information about the sampling group

In this section we describe the basic quantitative indicators of the structure of the observed sample. All indicators can be interpreted as the realizations of six attributive variables: Sex, Financial status, Age, Education, Knowledge of English, and Health status. These variables indicate the personal characteristics of the respondents that enrolled in the Individual Development Efficacy by using IT-course and team work, and it could be seen from the Table 1.

Table 1: Demographic structure of the personal characteristics of the respondents

<table>
<thead>
<tr>
<th>Items</th>
<th>Number</th>
<th>Percentage</th>
<th>$X^2$-statistics (p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>6</td>
<td>6.67</td>
<td>67.60$^{**}$</td>
</tr>
<tr>
<td>Female</td>
<td>84</td>
<td>83.33</td>
<td>(2.00E-16)</td>
</tr>
<tr>
<td>Income status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pensioner</td>
<td>60</td>
<td>66.67</td>
<td>10.00$^{**}$</td>
</tr>
<tr>
<td>Dependent</td>
<td>30</td>
<td>33.33</td>
<td>(1.56E-3)</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>65-70</td>
<td>24</td>
<td>26.67</td>
<td></td>
</tr>
<tr>
<td>71-75</td>
<td>24</td>
<td>26.67</td>
<td>7.60</td>
</tr>
<tr>
<td>76-80</td>
<td>30</td>
<td>33.33</td>
<td>(0.0550)</td>
</tr>
<tr>
<td>80+</td>
<td>12</td>
<td>13.33</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary School</td>
<td>24</td>
<td>26.67</td>
<td></td>
</tr>
<tr>
<td>Secondary School</td>
<td>24</td>
<td>26.67</td>
<td>20.40$^{**}$</td>
</tr>
<tr>
<td>Vocational</td>
<td>6</td>
<td>6.67</td>
<td>(1.40E-4)</td>
</tr>
<tr>
<td>Faculty</td>
<td>36</td>
<td>40.00</td>
<td></td>
</tr>
<tr>
<td>Knowledge of English</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>42</td>
<td>46.67</td>
<td>0.40</td>
</tr>
<tr>
<td>Now</td>
<td>48</td>
<td>53.33</td>
<td>(0.9402)</td>
</tr>
<tr>
<td>Health status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diseases</td>
<td>48</td>
<td>53.33</td>
<td>27.78$^{**}$</td>
</tr>
<tr>
<td>Disability</td>
<td>12</td>
<td>13.33</td>
<td>(4.047E-6)</td>
</tr>
<tr>
<td>Both of them</td>
<td>30</td>
<td>33.33</td>
<td></td>
</tr>
</tbody>
</table>

$p < 0.05$, $^{**}p < 0.01$

Source: Authors

The first column in the Table 1 shows the attributive modalities for each variable. Then, in the following two columns it could be seen the appropriate values of the absolute and relative (percentage) frequencies. Finally, the last column of Table 1 contains the appropriate values of Pearson's Chi-Square statistics, along with the corresponding p-values. These values indicate the significance of differences between the values of the modalities of the same attributive variable.
According to obtained values, the majority of the surveyed respondents are females. The total of them is 84, which equals 83.33% of the sample. The male group consists only of 6 persons, which equals 6.67% of the sample.

In the sense of the financial/income status of respondents, the pensioners represent exactly two thirds of the sample, while the others, one thirds of the sample, are dependents. The variable who indicates the age of the respondents contains 4 different levels. In this case, frequencies of respondents show the relative uniformity, which was confirmed by the relative low value of the chi-squared statistics ($\chi^2=7.60$).
The following variable describes the level of education of the respondents. Them the most, a total of 36, have a college education, while only six have vocational education. Therefore, unlike the previous variable, the levels of the education degree do not have the high uniformity. The highest degree of uniformity exists in the case of knowledge of English, where the Pearson’s chi-squared statistics has the lowest value ($\chi^2=0.40$). Precisely, 42 respondents, i.e. 46.67% of the sample, said that they know English, in contrast to 48 of them (53.33% of the sample) who do not know.

Finally, the last variable in this group, with the three attributive levels indicates the health status of respondents.
Training satisfaction, and training outcomes

In this part of our analysis, we calculated the basic statistics parameters (mean and standard deviation) for all the satisfaction levels in the IT-learning course for elder people, as well as the learning outcomes. In the first case, satisfaction levels of the IT-learning course can be classified into the three basic categories:

1. Satisfaction of the training content;
2. Satisfaction with the training group;
3. Satisfaction with the group’s team leader

![Figure 5: Satisfaction with the group and team work development](source)

*Source: Authors*

![Figure 6: Satisfaction with the group’s team leader](source)

*Source: Authors*
The levels related to the satisfaction of respondents with the training group have two categories: satisfaction with the group activities and satisfaction with the group development (questions Q14-Q15). Finally, the last category describes the satisfaction of the respondent with the group’s team leader. It contains three satisfaction levels: communication with the team leader, knowledge and commitment of the team leader (questions Q16-Q18). Table 2 indicates the mean values, standard deviation, as the appropriate descriptive assessments of each of the satisfaction levels (“much” or “very much”). The values that relate to the aggregate categories 1)-3) are underlined. As can be seen from the Table 2, the respondents were very much satisfied with the overall training: with the training content (average 4.55), with the group (average 4.80), and with the team leader’s work (average 4.73). When considered the score of each aspect of the training, it is found that the respondents are most satisfied with the group’s activities, followed by the commitment of the team leader. These two scores are equals 5.00 and 4.93, respectively. Respondents are “only” much satisfied with two categories of the training content at 4.41 and 4.27, respectively.

Table 2: The mean and standard deviation of the satisfaction levels in IT-learning

<table>
<thead>
<tr>
<th>Items</th>
<th>Mean</th>
<th>Stand. deviation</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfaction of the training content</td>
<td>4.55</td>
<td>0.5307</td>
<td>very much</td>
</tr>
<tr>
<td>Satisfaction with the group and team work</td>
<td>4.80</td>
<td>0.2536</td>
<td>very much</td>
</tr>
<tr>
<td>Group activities</td>
<td>5.00</td>
<td>0.0000</td>
<td>very much</td>
</tr>
<tr>
<td>Group development</td>
<td>4.60</td>
<td>0.5071</td>
<td>very much</td>
</tr>
<tr>
<td>Satisfaction with group’s team leader</td>
<td>4.73</td>
<td>0.4108</td>
<td>very much</td>
</tr>
<tr>
<td>Communication with team leader</td>
<td>4.53</td>
<td>0.5164</td>
<td>very much</td>
</tr>
<tr>
<td>Knowledge of team leader</td>
<td>4.73</td>
<td>0.4577</td>
<td>very much</td>
</tr>
<tr>
<td>Commitment of team leader</td>
<td>4.93</td>
<td>0.2582</td>
<td>very much</td>
</tr>
</tbody>
</table>

As for the training outcomes, the results are shown in Table 3.

Source: Authors

We found that the respondents’ learning outcomes are very much satisfactory with the average of 4.72. When considering each aspect of the learning outcomes, the satisfaction levels are classified into 7 categories of which for this paper are selected: communications and interpersonal skills, numerical and analytical skills, as the computer and IT skills (questions Q19-Q25). It is found that the respondents’ outcomes are very much satisfactory in every aspect. The highest level of satisfaction of the respondents were expressed at communication and interpersonal skills (average 4.87).
The relationship between training satisfaction, and training outcomes

Here, we analyze the relationship between the training satisfaction levels related to the satisfaction levels of the training outcomes. Table 4 illustrates that the overall, in the most cases, training satisfaction levels are positively related to training outcomes, with the statistical significance of .001. When considering the satisfaction of each aspect of the course, it is found that the satisfaction of the training content are positively related to the all training outcomes Pearson's product moment correlation coefficients for these relationships are: $r = 0.927$, $r = 0.618$, $r = 0.853$ and $r = 0.829$, respectively. Then, followed by the correlation between the logical reasoning with the computer and IT skills ($r = 0.702$).
Table 4: Correlation coefficients between satisfaction in IT-training and training outcomes

<table>
<thead>
<tr>
<th>Items/Satisfaction levels</th>
<th>Communication &amp; interpersonal skills</th>
<th>Numerical &amp; analytical skills</th>
<th>Computer &amp; IT skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfaction with the group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group activities</td>
<td>0.423</td>
<td>0.207</td>
<td>-0.018</td>
</tr>
<tr>
<td>Group development</td>
<td>0.480</td>
<td>-0.492</td>
<td>-0.417</td>
</tr>
<tr>
<td>Satisfaction with group’s team leader</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication with team leader</td>
<td>0.026</td>
<td>0.645</td>
<td>0.236</td>
</tr>
<tr>
<td>Knowledge of team leader</td>
<td>0.207</td>
<td>0.318</td>
<td>0.182</td>
</tr>
<tr>
<td>Commitment with team leader</td>
<td>0.103</td>
<td>0.170</td>
<td>-0.170</td>
</tr>
</tbody>
</table>

Source: Authors

Similar conclusion can be drawn in the case of satisfaction levels with the group. Satisfaction with the group activities are low correlated with all the training outcomes, also. The group development level is high correlated (only) with the responsibilities outcome, where the Pearson’s coefficient is $r = 0.722$.

At least, satisfaction with the group team leader is mainly positively related to the learning outcomes in all aspects, at the statistical significance of .001. The level of satisfaction with team leader are correlated with numerical and analytical skills the most ($r = 0.645$). Then, the following correlation between the level of satisfaction by the team leader’s knowledge, related to the cognitive skills ($r = 0.533$), etc. Finally, an interesting fact is that the last satisfaction level, commitment with team leader, does not significantly correlated with all the training outcomes (the highest value of Pearson’s correlation coefficients is $r = 0.224$).

The relationships between the satisfaction levels of the IT-training and the appropriate outcomes levels, we use the model of Multiple Regression Analysis. Most precisely, we interpreted three aggregate categories of satisfaction levels (satisfaction of the training content, group and team leader) as the realizations of three multidimensional input variables. Similarly, all outcomes satisfaction levels can be interpreted as the components of some multidimensional output variable. However, it is common that the calculated average values of outcomes levels, resulting in a single output variable. In this way, can be formed the appropriate Multiple Regression Model (MRM) which is best fitted to the observed data.

For the regression coefficients calculation, which are estimated according to the data, in this paper we used the original program code written in the statistical-oriented programming language “R”. Implementation of these software procedures allows so called glm-function in-Stats package. According to the estimated values of the regression coefficients, we are able to determine and quantify the quality of the obtained regression relationships, i.e. degree of agreement the obtained regression function with the empirical, observed data. For this purpose, we use the following three in practice the most commonly used quantitative indicators of the level of quality of the theoretical model:
1. **Standard estimation error (SEE)** is the average of the squares of the empirical data with respect to the rated ("fitted") values were obtained based on the regression. Clearly, the smaller the value of this ratio indicates a higher and better quality which theoretical model describes the empirical data set.

2. **Coefficient of determination ($R^2$)** is a relative measure of fitting the regression line with the empirical data, as the level of the explained variance in the corresponding regression model.

3. **Aikike’s information criteria (AIC)** is a quantitative indicator of a general agreement of the theoretical, fitting model in relation to the given set of empirical data. First introduced by Aikike (1974), this criterion is now very widely used in practical applications (Burnham, Anderson, 2002; Fang, 2011), as a measure of quality that empirical data are interpreted and compared with the corresponding statistical and theoretical model. Within a given class of theoretical models, the most convenient will be the one for which is realized the minimum values of the AIC. This means that the theoretical model that is chosen, the more competitive if the value of the AIC is lower.

In the following, we consider the prediction of the IT-training outcomes in depending on the levels of satisfaction with the group. As this category has (only) two levels: satisfaction of the group activities and group development, the appropriate multiple regression model depends (only) on these two predictive variables. From the Table 6 it can be seen that their estimated regression coefficients are relatively low, equal 0.2881 and 0.0567, respectively. The highest estimate corresponds to the intercept, equals 3.0223, at significantly level 0.01. This means that obtained regression model is less adequate since the previous, i.e. the IT-training outcomes do not depend significantly on the levels of satisfaction with group. This is, also, confirmed by the relatively low value of R-squared coefficients (contribution towards the prediction of the training outcomes is “only” 27.96%). The predictor equation in raw score is as followed:

$$Y_2 = 3.0223 + 0.2881 \text{ Group activities} + 0.0567 \text{ Group development}.$$

*Table 5: Multiple regression analysis of the satisfaction levels with the group*

| Items                  | Estimate | Std. error | t-value | Pr(>|t|) |
|------------------------|----------|------------|---------|----------|
| Intercept              | 3.0223   | 0.7976     | 3.789   | 2.58E-3* |
| Group activities       | 0.2881   | 0.1421     | 3.310   | 0.0162*  |
| Group development      | 0.0567   | 0.086      | 0.576   | 0.5754   |
| Residual standard error: SEE = 0.1865 on 12 degrees of freedom |          |            |         | *p < 0.05; **p < 0.01 |

| Multiple R-squared: $R^2 = 0.2796$, Adjusted R-squared: $R^2_{adj} = 0.1595$ |          |            |         |            |
| AIC = -3.158 |

**Source: Authors**

In the third part of the multiple regression analysis, we study the dependence of the training outcomes in relation to the satisfaction levels with the group’s team leader. This category has three levels, shown in the Table 6, along with the corresponding estimates of regression coefficients, equal 0.2046, 0.0933 and 0.2333, respectively. Also, in this case the intercept has the highest estimated value, equals 3.0223, at significantly level 0.01. However, unlike the previous regression model, here R-squared coefficient is much higher
(68.51%), as the Aikike’s coefficient is much lower (AIC = - 13.574). Therefore, we suppose that obtained model sufficiently well describes the observed dependency. The predictor equation in raw score is as followed:

\[ Y_3 = 2.165 + 0.2046 \text{ Communication with team leader} + 0.0933 \text{ Knowledge of team leader} + 0.2333 \text{ Commitment of team leader} \]

Table 6: Multiple regression analysis of the satisfaction levels with the group’s team leader

| Items                                | Estimate | Std. error | t-value | Pr(>|t|) |
|--------------------------------------|----------|------------|---------|----------|
| Intercept                            | 2.1650   | 0.6692     | 3.235   | 7.94E-3**|
| Communication with team leader       | 0.2046   | 0.0872     | 2.347   | 0.0387   |
| Knowledge of team leader             | 0.0933   | 0.1052     | 0.888   | 0.3937   |
| Commitment of team leader            | 0.2333   | 0.1487     | 1.569   | 0.1449   |

Residual standard error: SEE = 0.1288 on 11 degrees of freedom  

*p < 0 .05; **p < 0 .01

Multiple R-squared: \( R^2 = 0.6851 \), Adjusted R-squared: \( R^2 \text{ adj}= 0.5993 \)

Finally, we explore the dependence of the IT-training outcomes in relation of the mean scores of the all of three aggregate categories of satisfaction levels: satisfaction of the training content, satisfaction with the group, and satisfaction with the group’s team leader. The results of multiple regression analysis are shown in the Table 7. As we can see, the highest estimated value corresponds to the regression coefficient of third variable, equals 0.4248, at significantly level 0.01. Then it followed by the satisfaction of the training content, equals 0.3649, at significantly level 0.05. The lowest value corresponds to the second variable, satisfaction with the group, equals 0.2368.

Table 7: Multiple regression analysis of the aggregate categories of satisfaction levels

| Items                                | Estimate | Std. error | t-value | Pr(>|t|) |
|--------------------------------------|----------|------------|---------|----------|
| Intercept                            | -0.1082  | 0.9058     | -0.119  | 0.9070   |
| Satisfaction of the training content | 0.3649   | 0.1610     | 2.267   | 0.0445   |
| Satisfaction with the group          | 0.2368   | 0.0839     | 2.822   | 0.0166   |
| Satisfaction with the team leader    | 0.4248   | 0.0777     | 5.470   | 1.95E-4**|

Residual standard error: SEE = 0.0949 on 11 degrees of freedom  

*p < 0 .05; **p < 0 .01

Multiple R-squared: \( R^2 = 0.8290 \), Adjusted R-squared: \( R^2 \text{ adj}= 0.7824 \)

AIC = - 22.735

Source: Authors

Note that this “aggregate” regression model is of higher quality compared to the previous three models. This is evidenced by the relatively low value of the standard error (SEE = 0.949), as well as the Aikike’s coefficient (AIC = -22.375). At last, the R-squared
coefficient is relatively high (contribution towards the prediction of the training outcomes is even 82.9%). The predictor equation in raw score can be written as followed:

\[ Y = Y_1 + Y_2 + Y_3 = -0.1082 + 0.3649 \text{ Satisfaction of the training content} + 0.2368 \text{ Satisfaction with the group} + 0.4248 \text{ Satisfaction with team leader} \]

**Discussion and Conclusions**

By studying the learning outcomes predictor equation, the research found that satisfaction in course content, class activities, evaluation and the team leader can be used to explain the learning outcomes. This means that if the older people trained are satisfied with course content, class activities, evaluation and the team leader, their learning outcomes will also be higher. On the other hand, if they are less satisfied with these elements, the learning outcomes will be reduced as well. The factor that affects the learning outcomes the most is satisfaction of course content, followed by evaluation, class activities and team leader respectively. According to the finding from the conducted research, older people trained who are satisfied in learning will have higher learning outcomes.
References


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Economic growth and employment in the Republic of Serbia - Critical review

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Abstract

Economic policy is the main driver of growth and development of the national economy. Lack of public capital investments, overvalued exchange rate of the domestic currency, high interest rates, accepting the neoliberal concept in the Republic of Serbia have a devastating effect on economic growth, employment and standard of living. These issues are studied in this paper through empirical investigation and proving the facts stated.

\textbf{KEY WORDS:} economic growth, employment, economic policy, transition.

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\textbf{330.341(497.11)}

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Introduction

The transition process in the Republic of Serbia is characterized by the growth of economic activity, low employment, the decline in purchasing power and cheap labor force, implying a vicious circle of insolvency of companies and population ultimately leading to a drop in economic growth (GDP).

The fiscal and monetary and exchange rate policy, as well as the acceptance of the concept of neo-liberal policy strike down the competitiveness of domestic production in the domestic and international markets, thus killing domestic production, resulting in employment decline, low standard of living and increase of poverty.

Given the importance of the aforementioned issues, the paper is based on the analysis of economic activity expressed through GDP growth and its impact on employment.

Research methodology

Statistical method as a scientific method will be used for describing, learning, research, comparison and analysis between macroeconomic indicators: employment and economic growth expressed through the gross domestic product of the Republic of Serbia, which is the subject of research. The statistical evaluation are based on data from a sample of the twelve-year period so that based on them generalizations made on the case study would be made, estimated or predicted. In this regard correlation method through the use of Pearson’s correlation coefficient\(^{15}\) will be used, i.e. the relationship between variables within the proposed hypotheses based on the relations:

\[
r = \frac{n \sum xy - \sum x \sum y}{\left[ n \sum x^2 - (\sum x)^2 \right]^{1/2} \left[ n \sum y^2 - (\sum y)^2 \right]^{1/2}}
\]  

(1)

and the implementation of bidirectional \(t\)-test with a critical value of the test for \(\alpha/2\), \(t_{\alpha/2}\), \(v = n-2\), the level of significance of the test \(\alpha = 0.01\) with the following decision rules:

- \(H_0\) is acceptable if |\(t\)| < \(t_{\alpha/2}\)
- \(H_1\) is not accepted if |\(t\)| ≥ \(t_{\alpha/2}\).

The test statistics is:

\[
t = \frac{r}{s_t}
\]

(2)

\[
s_t = \left[ \left(1 - r^2 \right) / (n - 2) \right]^{1/2}
\]

(3)

as well as the descriptive method describing the scientific knowledge of the research subject into the symbolic language of science.

The sample to be tested in the study was made on the basis of official (secondary) and relevant data that are officially published including the number of employed and gross

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\(^{15}\) The interpretation correlation is interpreted in the following way for the obtained values of the coefficient \(r\): to 0.70- Negligible linear relationship, from 0.70-0.80- Significant linear correlation, from 0.81-0.90- a highly significant correlation linear relationship, from 0.91-0.99- very high linear correlations, 1- perfect linear correlation (According to: Vera Djordjevic (2004) Statistics in Economics, Faculty of Economics, Niš., p. 283)
domestic product in the period of 2000-2012 in the Republic of Serbia in order to obtain an impartial assessment of the tested parameters. When determining the number of years that will form the sample it was taken into account that the number is suitable and sufficient for statistical processing of data and that the time period is within a range based on which it a proper judgment can be made on the laws of motion of the parameters analyzed. Given that most of the paper is about testing based on numerical data the elements comprising the sample are appropriate for their indicators to be viewed individually and as summarized, and customized to the methods of hypotheses testing.

**The gross domestic product of the Republic of Serbia**

Gross domestic product is a macroeconomic indicator of the development of the national economy. Hereinafter the movement of gross domestic product in the Republic of Serbia in the period 2000-2012 (Table 1) is analyzed.

<table>
<thead>
<tr>
<th>Year</th>
<th>In 000. RSD* -current prices-</th>
<th>Price growth index (inflation)</th>
<th>GDP in 000. RSD -constant prices/ (2000=100)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Chain**</td>
<td>Cumulative</td>
</tr>
<tr>
<td>2000</td>
<td>384.224,8</td>
<td>100,00</td>
<td>384.224,8</td>
</tr>
<tr>
<td>2001</td>
<td>762.178,4</td>
<td>191,8</td>
<td>397.381,9</td>
</tr>
<tr>
<td>2002</td>
<td>972.579,7</td>
<td>119,5</td>
<td>424.336,7</td>
</tr>
<tr>
<td>2003</td>
<td>1.125.839,6</td>
<td>111,7</td>
<td>439.781,1</td>
</tr>
<tr>
<td>2004</td>
<td>1.380.711,6</td>
<td>110,1</td>
<td>489.787,7</td>
</tr>
<tr>
<td>2005</td>
<td>1.683.483,3</td>
<td>116,5</td>
<td>512.631,9</td>
</tr>
<tr>
<td>2006</td>
<td>1.962.072,9</td>
<td>112,7</td>
<td>530.146,7</td>
</tr>
<tr>
<td>2007</td>
<td>2.276.886,2</td>
<td>106,8</td>
<td>575.989,4</td>
</tr>
<tr>
<td>2008</td>
<td>2.661.368,7</td>
<td>110,9</td>
<td>607.202,5</td>
</tr>
<tr>
<td>2009</td>
<td>2.720.083,5</td>
<td>110,1</td>
<td>563.631,1</td>
</tr>
<tr>
<td>2010</td>
<td>2.881.891,0</td>
<td>108,6</td>
<td>549.874,3</td>
</tr>
<tr>
<td>2011</td>
<td>3.208.620,2</td>
<td>111,0</td>
<td>551.498,8</td>
</tr>
<tr>
<td>2012</td>
<td>3.348.689,2</td>
<td>107,8</td>
<td>533.910,9</td>
</tr>
</tbody>
</table>

*Source: *Statistical Bulletin, National Bank of Serbia, January 2014. (08.03.2015.); **Statistical yearbook of the Republic of Serbia 2014, Belgrade; Author’s calculations.

Table 1 shows GDP at current prices. To realistically consider the GDP growth movement it was adjusted for price growth in the period analyzed, whereby the base year is 2000. The realistic movement of GDP growth is shown in Table 2.
Table 2: Indices of growth GDP (base year = 2000)

| Year | GDP--current prices-- | | BDP--constant price-- |
|------|-----------------------|------------------------|
|      | Chain indices | Cumulative | Chain indices | Cumulative |
| 2000 | 100,00 | - | 100,00 | - |
| 2001 | 198,37 | 198,37 | 103,42 | 103,42 |
| 2002 | 127,61 | 253,14 | 106,78 | 110,43 |
| 2003 | 115,76 | 293,03 | 103,53 | 114,33 |
| 2004 | 122,64 | 359,38 | 111,37 | 127,33 |
| 2005 | 121,93 | 438,19 | 104,66 | 133,26 |
| 2006 | 116,55 | 510,71 | 103,42 | 137,82 |
| 2007 | 116,04 | 592,63 | 108,47 | 149,49 |
| 2008 | 116,98 | 692,72 | 105,56 | 157,81 |
| 2009 | 102,21 | 708,03 | 92,82 | 146,48 |
| 2010 | 105,95 | 750,16 | 97,56 | 142,90 |
| 2011 | 111,43 | 835,23 | 100,30 | 143,33 |
| 2012 | 104,37 | 871,73 | 96,81 | 138,76 |

Source: Author’s calculations.

GDP growth in the analyzed period, expressed in current prices amounted to 771.73%. However, the real growth of GDP expressed in constant prices is 38.76%. GDP growth by the year 2008 ended with a positive growth rate. Since 2009, GDP growth has a negative growth rate (except in 2011, when the GDP recorded a negligible positive growth rate of 0.30%). The positive GDP growth rate in the period 2001-2008 was realized when there was mass privatization (sale) of domestic companies. Revenues from the sale were not engaged in capital investment but in filling the budget and were used for public consumption. Such an aspect of spending the revenue generated from the privatization of domestic companies did not create the conditions for economic development and growth of the domestic economy. Since 2009, when there were no more potentially profitable enterprises for privatization, despite an increase in tax and excise rates and other fiscal levies, the budget deficit and public debt are becoming larger.

The main characteristic of the fiscal system in Serbia is the focus on the depletion of the fiscal capacity of the economy and directing thus concentrated financial resources to the rehabilitation of the consequences of the economic and social policy of public authorities (Adzic, Popovic, 2005). For a large number of taxpayers the tax system is unfair, making it difficult and limiting factor in terms of unfolding economic and social life (Isailović, 2009). Due to insufficient progressive system of income taxation and expressed regressive nature of indirect taxes, the tax system in Serbia is designed in such a way that the largest part of the tax burden falls onto the population layers with lower economic power (Djurovic-Todorovic, Djordjevic, 2010), which determines the adoption of economic decisions and
affects the inadequate redistribution of income. Each tax form\(^{16}\) represents a burden both
for businesses but also for residents and is manifested by the decrease in disposable income
and every reduction in disposable income results in a reduction in demand.

**Employment in the Republic of Serbia**

Discussed in the previous section is the movement of gross domestic product growth. In the Republic of Serbia a low value of GDP is achieved. Further in the paper the trends in employment in the period of 2000-2012 (Table 3) are analyzed.

<table>
<thead>
<tr>
<th>Year</th>
<th>In mill. RSD</th>
<th>Growth indices</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Chain indices</td>
</tr>
<tr>
<td>2000</td>
<td>1.908</td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td>2.102</td>
<td>110,17</td>
</tr>
<tr>
<td>2002</td>
<td>2.067</td>
<td>98,33</td>
</tr>
<tr>
<td>2003</td>
<td>2.041</td>
<td>98,74</td>
</tr>
<tr>
<td>2004</td>
<td>2.051</td>
<td>100,49</td>
</tr>
<tr>
<td>2005</td>
<td>2.069</td>
<td>100,87</td>
</tr>
<tr>
<td>2006</td>
<td>2.026</td>
<td>97,92</td>
</tr>
<tr>
<td>2007</td>
<td>2.002</td>
<td>98,82</td>
</tr>
<tr>
<td>2008</td>
<td>1.999</td>
<td>99,85</td>
</tr>
<tr>
<td>2009</td>
<td>1.889</td>
<td>94,50</td>
</tr>
<tr>
<td>2010</td>
<td>1.796</td>
<td>95,08</td>
</tr>
<tr>
<td>2011</td>
<td>1.746</td>
<td>97,22</td>
</tr>
<tr>
<td>2012</td>
<td>1.727</td>
<td>98,91</td>
</tr>
</tbody>
</table>

*Source: Basic macroeconomic indicators, Ministry of Finance, Republic of Serbia (03.08.2015); Municipalities in Serbia 2001, Institute of Informatics and Statistics, Republic of Serbia (08.03.2015); Author’s calculations.*

In the observed period the employment decreased in 2012 compared to 2000, by 9.49%. The employment growth was recorded only in 2001 (10.17%), 2004 (0.49%) and 2005 (0.87%). In all other years the employment growth has had a negative growth rate. Pronounced decline in employment has started from 2009 onwards.

\(^{16}\) It is considered that in Serbia there are over 250 fiscal levies of which 56 are obligatory levies to economic entities. Further, according to a study on para-fiscal levies on economy, made by USAID, 179 para-fiscal levies were identified burdening businesses, of which the financial burden arising from 77 non-tax levies amounted to 570 euros per year per employee in the economy during 2011.
Low employment and negative growth rate in employment resulted from the economic downturn. Fiscal and monetary and exchange policy stimulated the import of foreign products, making unable domestic products to be competitive in both domestic and foreign markets. The constant appreciation of dinar against the world's major currencies contributed most to it. Stimulating the import of foreign products suppressed domestic production, leading to a low level of utilization of domestic capacity, bankruptcy of enterprises and the fall in employment.

Stimulating imports forced consumption of foreign consumer goods, which with cheap euro exercised significantly greater competitiveness than the real one, which led to a decrease in demand for domestic products and declining level of capacity utilization of domestic producers (Stamenkovic et al., 2011). Overvalued domestic currency and high interest rates are a recipe for disaster (Stiglitz, 2001). It is true that the exchange rate is determined by the market, but that market is heavily manipulated and deformed by the burden of servicing the public debt denominated in foreign currency being moved far into the future, so the market is distorted was thus found under the influence of strong foreign capital inflows from privatization and on other grounds where the resulting appreciation of the dinar also limited in time and is separated from the fundamental factors determining the structure and functioning of the economy and as such it represents a devastating blow for the economy (Madžar, 2005). The growing importance of these issues is the fact that the drastic drop of purchasing power of the population due to the synergistic effects of the inflation rate and the rate of decline in employment causes less demand, which further entails a further decline in employment due to layoffs and on that basis the reduction in purchasing power (Stamenkovic, Pavlovic, 2011).

In addition, one should bear in mind that the employment policy was highly unsatisfactory given that numerous studies and analyzes indicate that Serbia does not have adequate management that is able to quickly and effectively respond to the key challenges posed by environment (Pavlovic et al., 2012). According to the Labour Force Survey in 2010 (Labour Force Survey, 2010) from a total of 2,396,244 persons employed 124,813 (5.2%) of them were legislators, officials and managers by profession. "Dominating on the leadership and responsible positions are the employees with secondary education (49%), which represents a very high percentage especially if it is taken into account that this number accounts for half of employees in managerial and responsible positions, and that it is higher than the number of employees with higher education. The situation is even more dramatic if one considers the number of employees in these positions who have completed primary school or have not completed elementary school. Cumulatively, the total number of employees in managerial and responsible positions without higher education makes 65.78%, which is extremely high percentage. Although the percentage of employees with primary education and incomplete primary school is low, it is simply unacceptable that in modern and complex business environment, requiring a series of multidisciplinary knowledge that people with inadequate levels of education perform a range of leadership and responsible functions (Pavlović et al., 2012)."
The research results

Based on the descriptive and visual analysis on the presented tables it is evident that there is no divergence in the movement of the analyzed variables. However, in order to determine the visual indicators it is necessary to test the aforementioned statement so that we could conclude that the statement has been translated into the facts. Therefore, we start from setting the hypotheses:

Setting the null and the working hypothesis:

\[ H_0: \text{If employment is increased, there will not come to the increase in gross domestic product in the Republic of Serbia.} \]

\[ H_1: \text{If increase employment is increased, there will be an increase in gross domestic product in the Republic of Serbia.} \]

On the basis of the relation (Adzic, Popovic, 2005) and (Dašić, 2012), we obtain the correlation coefficient:

\[ r = 0.998777437 \]

By implementing bidirectional t-test at a significance level \( \alpha = 0.01 \) we get the test statistics based on the relation (Labour Force Survey, 2010) and (Djordjevic, 2004):

\[ t = \frac{r}{s_t} \]

\[ t = 63.77995 \]

As table value is \( t_{v, \alpha/2} = t_{10,0.005} = 3.2498 \), the value of the test statistic \( |t| \) is in the rejection area of \( H_0 \) as \( |t| = 3.2498 < 63.77995 \) and thus alternative (work) hypothesis is adopted If employment is increased there will come to an increase in gross domestic product in the Republic of Serbia with the risk of error of 1%.
Conclusion

On the basis of the research it can be concluded that there is a direct positive correlation relationship between employment and economic growth. In this regard, it is necessary to establish adequate economic and environmental conditions through economic policy measures that will be aimed at increasing employment.

This statement is particularly significant given that the decline in economic activity with an unfinished process of transition in the Republic of Serbia unites mass unemployment and the high level of inflation, which is very detrimental to the development of the domestic economy.

It should be noted that numerous economists believe that high unemployment or high level of employment reduction is a greater evil than inflation, and thus imposed as the imperative is the regulation of employment and wage levels through legal imperative norms, and the establishment of fair employment policies.
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Entrepreneurial Values Research in Serbia

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Abstract

Research on entrepreneurship has grown dramatically over the past decade, with the recognition of new ventures as major contributors to creation and economic growth. This paper is based on empirical survey of students of business economy like prospective entrepreneurs toward more contextual and process oriented research, trying to explain behavior, predict performance and motivation for entrepreneurial values verification, ideas, innovation and culture. The purpose of this research is to explore the entrepreneurship profile of Serbian students and to make an evaluation for their entrepreneurship orientation. The survey was conducted by direct interviewing during 2013, on a sample of 143 respondents of both genders (61 male and 82 female), aged 20 to 55 years. Respondents were students of economic profile in an random sample. The research methods used are: ANOVA (one and two factor analysis of variance), multivariate analysis of variance (MANOVA), Tukey's "post hoc" test and factor analysis (with Likert type items). Seeking to clarify the construct of individual entrepreneurial intent, there is found positive attitude of Serbian students towards entrepreneurship, with different level of self ‘efficacy, competence factors to initiate entrepreneurial initiative. According to the empirical findings, becoming an entrepreneur and acting as an entrepreneur are both aspects of the entrepreneur’s learning process, which in turn has an effect on the personality characteristics of the entrepreneur. Entrepreneurial characteristics amongst university students would further impact some insights for entrepreneurship education and training in Serbia.

KEY WORDS: Entrepreneurship, Personality, Change, Intention
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Introduction

Entrepreneurship is getting very powerful economic philosophy in every aspect of business thinking and planning. In the base of this paradigm are- creativity, risk taking, innovation, and passion which led the way to economic development more than other forces, especially in crisis times. Companies like with high entrepreneurial impact have produced technological breakthrough (LinkedIn, Google, Amazon, and Facebook etc., ) New challenges to be encounter with, as green technologies, social entrepreneurship, sustainability, technological change, find more often solutions to these challengers in entrepreneurial drive, culture, values and motivation. Global Consortium of Entrepreneurship Centers founded in the 21st Century have been every day followed by Entrepreneurship Research Fellows, top scholars and journals. The commercialisation process of creative ideas into businesses continues to be a major force in new job creation and economy development. Students ad scholars need courses and programs that set a framework for better understanding the process, values and the culture of entrepreneurship (Kuratko, 2014; Michael et al., 2012) . Motivational theories of behavior suggest (Ajzen, 1991) the exploitation of inadvertently discovered opportunities through starting a firm with purposeful intention that precipitates action.

This paper explores the contents of the entrepreneurial intent through testing factors concerning the attitudes towards entrepreneurial activity of the students of business economy in Serbia, and their self 'efficacy. Beside literature background and theories concern this issue, are given methodology and sampling, as well as key findings on testing given hypothesis. At the end are given discussion and conclusions and references used to elaborate the results of the research.

Literature Background

Definitions

Individual entrepreneurial intent can be defined as an independent awareness of the person or a team willing to start a business opportunity to realize it in future, although it might be never turned into that business. Personal, internal capabilities, motivation, knowledge and might have not enough of internal factors for the realisation of the entrepreneurial idea, also might be external framework and business environment not supportive enough, financial, fiscal, local. The term entrepreneurial intent covers different concepts, such as the desire to own a business, vocational aspiration, career orientation, nascent entrepreneurs, outlook on self-employment, what are related but not the same contents. There are a lot of efforts in identifying the individual cognitions, personality traits, personal circumstances, and micro- and macro-environmental conditions associated with entrepreneurship in research activities as well as from the policy decision maker on employment and new venture creation favorable ambient.

Individual entrepreneurial intent has been the issue studied in many scientific works, among which are: used as a dependent or independent variable in numerous studies Autio et al., (1997); Brandstatter, (1997);Chen et al., (1998); Davidsson, (1995); Francis, Banning, (2001); Frank,Lüthje, 2004; Hmieleski, Corbett, 2006; Kenedi et al., 2003) have
been used that intent as a dependent or independent variable in their studies. The authors, Palich, Bagby, (1995) concerned it as an important construct in research relating to enterprising individuals, their cognitions of business opportunities, and their decisions of whether or not to risk exploiting the intent by creating new ventures.

**Entrepreneurship theory and other scientific fields**

Entrepreneurship includes a wide range of fields like: decision sciences, economics, management, sociology, and psychology. Since 1967, early theories based on the psychological characteristic of entrepreneurship have been developing, (Brochhaus and Horowitz, 1985; Shaver and Scott, 1991). The authors consider that a comprehensive psychological portrait of new venture creation will need to consider general orienting dispositions, motivation and personal motives, which traits can be part experience, or part of training and education, or a product of the entrepreneurial inner factors, (Low, MacMillan, 1988; Sexton, Bowman, 1985). Need for achievement as second important personal characteristic of further successful entrepreneur, was characterised mostly by McClelland (1967) (Begley, Boyd, 1986; Johnson, 1990).

Entrepreneurs correct the waste of resources by recognizing what other people have overlooked in a state of imperfect information and other market imperfections, what makes the value of entrepreneurship at all. In theory of entrepreneurship the distinction made between risk and uncertainty is also important. Some authors like Knight does, (1921) included financial economy, behavioural decision sciences adapting alternative constructs of attitudes and behavioural towards risk, Shoemaker, (1982) and Machine, (1987) worked on different permutation of the expected utility model. From that aspects, entrepreneurs are characterized either by low levels of uncertainty aversion, rather than risk or as having different perceptions about the uncertainty and assumes the uninsurable uncertainties.

Today, innovation considers being the most important factor of entrepreneurial values, because innovation lies at the core of the entrepreneurial activity. Because of that, an undetermined amount of new tangible and intangible capital with uncertain return could be created. In this context main sources of the potential entrepreneur consider: technical uncertainty, time needed to develop the innovation, demand uncertainty – number of customers may demand the innovation (Picot et al., 1990), and the pace at which imitation and competing innovation will erode the profit that may be inherent in the innovation. According to Baumol (1990) and other authors, beside personal inner characteristics of the potential entrepreneur, the environment determines the characteristics of population of organizations and dictates the ultimate effects on the allocation of entrepreneurial resources.
Research

Design/methodology/approach

The aim of the field research is perceived social values of entrepreneurship and personal skills affect entrepreneurial intentions of students.

The survey was conducted by direct interviewing during 2013, on a sample of 143 respondents of both genders (61 male and 82 female), aged 20 to 55 years. Respondents were students of economic profile.

Basic research instrument was a questionnaire that students- participants completed in following towns in Serbia: Belgrade, Loznica, Ruma, Subotica, Vrbas and Senta. In short, a questionnaire is administered to students, with questions related to demographic variables, entrepreneurial inclination, and entrepreneurial inner characteristics (with Likert type items).

There were used further research methods: ANOVA (one-factor analysis), two-factor analysis of variance), multivariate analysis of variance (MANOVA), Tukey's "post hoc" test and factor analysis. Analysis of variance (ANOVA) was used as an analytical model for testing the significance of differences of variability, as well as analysis of their mutual influence, making it impossible to estimate otherwise. To determine intergroup differences both a multivariate analysis of variance (MANOVA), Tukey's "post hoc" test are used to determine the comparison the absolute value of the difference between the mean values. The bigger difference between two mean values than the critical difference means that the difference between two average values is significant. Factor analysis as "a set of mathematical and statistical methods are also used to allow a greater number of variables, among which there is, a connection which establishes a small number of fundamental variables factors that explain this interconnectedness. The purpose of usage these methods are:

- identification and understanding of common characteristics of several variables, and
- reducing the number of variables that can "overlap" as they have a similar meaning and behavior.

The questions in the questionnaire are treated as variable possibilities and limitations. Factors that may influence the variables are- gender, place of residence, age (age) and the current year of study. In Table 1 are listed the names of influential factors with the following meanings: city means a place in which the survey was conducted, gender stands for the population of female and male, age means age of respondents, year of study indicates the current year of study of those students who filled out the survey. The number in each of the factors is the codename that was used in SPSS program.

<table>
<thead>
<tr>
<th>Between-Subjects Factors</th>
<th>Factors deter.</th>
<th>No of questionaries'</th>
<th>Factors deter.</th>
<th>No of questionaries'</th>
<th>Factors deter.</th>
<th>No of questionaries'</th>
<th>Factors deter.</th>
<th>No of questionaries'</th>
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</thead>
<tbody>
<tr>
<td>Town</td>
<td>No.</td>
<td>Gender</td>
<td>No.</td>
<td>Age</td>
<td>No.</td>
<td>Year of study</td>
<td>No.</td>
<td></td>
</tr>
<tr>
<td>Belgrade (11)</td>
<td>24</td>
<td>female (1)</td>
<td>82</td>
<td>20 - 25 (1)</td>
<td>60</td>
<td>(2)</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>Loznica (22)</td>
<td>39</td>
<td>men (2)</td>
<td>61</td>
<td>28 - 30 (2)</td>
<td>21</td>
<td>(3)</td>
<td>66</td>
<td></td>
</tr>
<tr>
<td>Ruma (33)</td>
<td>15</td>
<td>Total</td>
<td>143</td>
<td>31 - 35 (3)</td>
<td>23</td>
<td>(4)</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>Kanjiza (44)</td>
<td>32</td>
<td></td>
<td></td>
<td>36 - 40 (4)</td>
<td>23</td>
<td>(5)</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Vrbas (55)</td>
<td>21</td>
<td></td>
<td></td>
<td>41 - 45 (5)</td>
<td>9</td>
<td>Total</td>
<td>143</td>
<td></td>
</tr>
<tr>
<td>Senta (66)</td>
<td>12</td>
<td></td>
<td></td>
<td>46 - 50 (6)</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>143</td>
<td></td>
<td></td>
<td>51 - 55 (7)</td>
<td>1</td>
<td>Total</td>
<td>143</td>
<td></td>
</tr>
</tbody>
</table>
The questionnaire had 17 questions which in the opinion of the authors are basic variables for evaluating of entrepreneurial resources, knowledge and skills of young people in Serbia. For evaluation of the variables in the questionnaire was used Likert scale with five levels of gradation:

- "I do not agree in any case", (Not a single element of a favourable assessment in any segment)
- "Few disagree", (A very small number of elements questions can obtain a positive assessment sufficient)
- "Middle agree ", (up to 50% of the elements issues can be Rating enough or good)
- "Mostly agree", (Over 70% of the elements can positively assess very good grade)
- "Completely agree", (All questions can be positive elements to evaluate high grade).

**Key findings**

There were two groups of Hypothesis tested in the research concerning entrepreneurial intent and inner capabilities of the students: H1 - Young people in Serbia have a positive attitude towards entrepreneurship.

Questions for elaboration of this attitude was:

- PS1 - I am the leader and I have a strong need for independence and self-employment.
- PS2 - I am a dynamic person with a clear vision and I'm ready to go in its implementation, together with my potential team
- PS3 - I am a person goals -oriented and I'll do the best to achieve long-term success.
- PS4 - I can be a long concentrated to do the work to which I have dedicated.
- PS5 - I take full responsibility for finishing tasks, as soon as I receive them.
- PS6 - I constantly analyze opportunities and businesses ideas that have potential commercial value.
- PS7 - I keep regular contact with other people that could identify a new opportunity for business.
- PS8 - I like to check my ideas with other people and get their opinion.
- PG9 - My main motive and incentive to start a business is the money that I earn and provide funds for the family.
- PS 10 - I want to be my own boss and to have freedom.
- PS11 - I want to prove that it can work successfully.
- PS12 - I want to redeem/liquidate the knowledge, skills, experience.
- PS13 - I believe in achieving a good balance between my business and family life.
- PS14 - I have the resources and I'm ready to invest own money (I have the will to invest and at the risk of losing), my life savings for a good business idea.

**Table 2: Reliability Statistics za H1**

<table>
<thead>
<tr>
<th>Cronbach's Alpha</th>
<th>Cronbach's Alpha Based on Standardized Items</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>.825</td>
<td>.830</td>
<td>14</td>
</tr>
</tbody>
</table>
For the processing the data obtained by interviewing was used SPSS software. The first was determined the value of Cronbach alpha coefficient in order to determine the level of internal consistency of the data. The result shows that the reliability of the research instruments was satisfactory according the high value of Cronbach alpha coefficient =0.825 (T2)

Table 3: Results of descriptive statistics for variables hypothesis (H1 - Young people in Serbia have a positive attitude towards entrepreneurship)

<table>
<thead>
<tr>
<th>Item</th>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>Std. Deviation</td>
</tr>
<tr>
<td>PS1</td>
<td>3.72</td>
</tr>
<tr>
<td>PS2</td>
<td>3.93</td>
</tr>
<tr>
<td>PS3</td>
<td>4.22</td>
</tr>
<tr>
<td>PS4</td>
<td>4.29</td>
</tr>
<tr>
<td>PS5</td>
<td>4.17</td>
</tr>
<tr>
<td>PS6</td>
<td>3.67</td>
</tr>
<tr>
<td>PS7</td>
<td>3.59</td>
</tr>
<tr>
<td>PS8</td>
<td>3.83</td>
</tr>
<tr>
<td>PS9</td>
<td>3.97</td>
</tr>
<tr>
<td>PS10</td>
<td>4.01</td>
</tr>
<tr>
<td>PS11</td>
<td>4.07</td>
</tr>
<tr>
<td>PS12</td>
<td>3.86</td>
</tr>
<tr>
<td>PS13</td>
<td>3.74</td>
</tr>
<tr>
<td>PS14</td>
<td>2.65</td>
</tr>
</tbody>
</table>

Results present the answers of the questions concerning the hypothesis H1 (Table 3) and show that the variable PS1 to PS13 are predominantly marked as 4 ("Mostly agree" - over 50% of the elements can positively assess a very good score) and 5 ("completely agree" - all elements of the issues can be positive to evaluate high grade). For example, the variable PS1 are quad rated 37.1%, a grade "5" had given even 35.1% of the surveyed students. This means that over 72% of respondents believe that they can be leaders in their work and have a strong need for independence and individual work. Over 80% of respondents expressed a desire to cash in knowledge, skills, experience, etc. (PS12). Answering to the question PS 14 (I have the resources and I'm ready to invest its own money that at the risk of losing my savings for a good business idea.), in over 70% of respondents indicate that they do not have sufficient capital and are not willing to risk it.

Table 4: Summary Item Statistics

<table>
<thead>
<tr>
<th>Item Means</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Range</th>
<th>Maximum / Minimum</th>
<th>Variance</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,867</td>
<td>2,654</td>
<td>4,290</td>
<td>1,636</td>
<td>1,616</td>
<td>.175</td>
<td>14</td>
</tr>
</tbody>
</table>

Summary results (Table 4) confirm that young people in Serbia have a positive attitude towards entrepreneurship. As obstacles like: the lack of capital, unfavorable loans, unfavorable economic climate, corruption, legal uncertainty, high duties, political instability, a general downturn in the world and FIG, they consider the main reasons for the lack of entrepreneurial activities in Serbia.
Self Efficacy

For self-efficacy, or for evaluation H2 - Young people in Serbia are competent to initiate entrepreneurial activity, were used students' attitudes given to the following questions:

— Q1 - I’m capable to write a business plan that the bank will accept.
— Q2 - I am able to explore all aspects of the market for my products.
— Q3 – Can I independently make a plan for the promotion of products?
— Q4 - I know to count all variable, fixed and other costs.
— K5 - I am able to minimize costs
— K6 - I can start my own business with less start-up capital.
— K7 - I know to count a cash flow.
— K8 - I know to write strategic business plan.
— K9 - I know to conduct operational business plan.
— K10 - I am able to recruit capable employees
— K11 – I can carry out the training of my employees.
— K12 – I am informed of the regulations and obligations regarding employment.
— K13 - I know the rules and procedures to start a business.
— K14 - I know the tax and other public obligations.
— K15 - I am able to lead and motivate employees.
— K16 - I am able to control and improve business processes.
— K17 - I am able to control cash flows and repayment of loans.
— K18 - I am able to find the necessary capital and to borrow money for my business.
— K19 - I have self-confidence and can deal with risks, efforts and high pressures that private business carries.

Table 5: Reliability Statistics za H₂

<table>
<thead>
<tr>
<th>Cronbach's Alpha</th>
<th>Cronbach's Alpha Based on Standardized Items</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>.932</td>
<td>.933</td>
<td>19</td>
</tr>
</tbody>
</table>

The obtained value of Cronbach alpha coefficient = 0.932, what implies that the level of internal consistency of the data is very high, and the reliability of the research instruments is very good.

Table 6: Results of descriptive statistics for variables hypothesis (H₂ - Young people in Serbia are competent to initiate entrepreneurial activity)

<table>
<thead>
<tr>
<th>Item Statistics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>Std. Deviation</td>
</tr>
<tr>
<td>K1</td>
<td>3.49</td>
</tr>
<tr>
<td>K2</td>
<td>3.72</td>
</tr>
<tr>
<td>K3</td>
<td>3.46</td>
</tr>
<tr>
<td>K4</td>
<td>3.55</td>
</tr>
<tr>
<td>K5</td>
<td>3.75</td>
</tr>
<tr>
<td>K6</td>
<td>3.33</td>
</tr>
<tr>
<td>K7</td>
<td>3.31</td>
</tr>
</tbody>
</table>
The surveyed students believe that are predominantly competent and have the necessary knowledge and skills to run the business of a future enterprise and successfully. The mean score values generally are above 3.5, except for the variable K18 (I am able to find the necessary capital and to borrow money for my business), which is certainly connected with the above conclusion that the loans are unfavorable.

Table 7: Summary Item Statistics

<table>
<thead>
<tr>
<th>Item Means</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Range</th>
<th>Maximum / Minimum</th>
<th>Variance</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.58</td>
<td>2,963</td>
<td>3,932</td>
<td>.969</td>
<td>1,327</td>
<td>.048</td>
<td>19</td>
</tr>
</tbody>
</table>

The results in Table 7 show that over 50% students considered having the necessary competencies and skills.

Discussion and Conclusions

Entrepreneurial intent and capabilities of young people has been studied in this research from the aspect of their wish, personalities, skills, risk taking and knowledge about the business starting up. It is based on psychosocial theory and models, these which can change behavior and model of planned behavior.

The research results show that young people in Serbia have a positive attitude towards entrepreneurship and want to start a private company. Over 70% of students, who have been in the researched sample are variable rated with 4 and 5, expressed willingness to accept entrepreneurial risks and want to start and run their businesses. Also they are feeling themselves sufficiently trained - competent to launch and successfully run potential businesses. Given that entrepreneurial activity is insufficient, certainly causes should be sought in a number of very prominent obstacles that must be solved at the level of daring authorities. In this sense, it is seen that is required further research of the conditions and ambient for starting businesses and operations, in order to define problems and give suggestions for their closure or mitigation the obstacles for entrepreneurial activity.

These results can be discussed further in comparison with some of the previous tested models connected with the research:

— (ESM) model on 300 University students in Turkey (2008) about contextual factor impact on entrepreneurial intent. In the model, entrepreneurial intention is a function of educational factors and structural support. Theory of planned behavior
to strengthen entrepreneurial intentions has been tested in 12 countries representing all ten global regional clusters, which were identified on the GLOBE project. Based on 1,748 questionnaires collected from university business students in 12 countries, it has been shown that by using the model of planned behavior can successfully be predicted entrepreneurial intention in each of the study countries, although, varying by the country;

— Further studies provided on the impact to self-employment, on a sample of 414 MBA students of entrepreneurship courses in Australia, China, India and Thailand. Entrepreneurial intention is measured by four items with the use of 7 - points Likert scale. It was found that the individual entrepreneurial intentions are positively associated with prospection desirability and feasibility of experiences, having demonstrated the negative effects of the interaction between the individual and the perceptions of the desirability of their experiencing justification for determining the power of their intentions to be self-employed;

— Example of good research practice is also tested entrepreneurial intentions of the Finnish business students to be engage in the process of entrepreneurship. Entrepreneurial education, entrepreneurial experience, proactive personality is found as factors of direct and entrepreneurial self-efficacy as of indirect impact.

— In 2010, 650 students in Asian countries, including Indonesia, Japan, South Korea, and Taiwan have been surveyed on students’ entrepreneurial intentions. Determining factors varied from country to country, where: self-efficacy, environmental factors, age and gender are showed to have a significant influence on entrepreneurial intentions. It can be concluded that results of the research could be valuable contribution for founding new educational programs for potential entrepreneurs, as well as to inspirit with an entrepreneurial spirit and culture other discipline studding at business economy. To improve the information system on available resources, obligations and framework conditions for flourishing entrepreneurial ideas of high educated prospective entrepreneur would be necessary.
References


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Unique concept of standardization, modularization and customization of products as a strategy of e-business

Krstić Milan20, Skorup Ana21, Milosavljević Bojan22

Abstract

Starting from the current economical paradigm – economics based on knowledge, this paper investigates production concept of realization of a complex product within production business system (PBS). The aim of this paper is to find an appropriate production concept which will enable PBS to suitably respond to the challenges of global environment, and in such way provide their survival, growth and development. Those are the reasons this paper analyzes relevant aspects of production concepts of product realization, that is, standardization, modularization and customization of products. Results of the analysis point to cyclic nature, that is, recursion of production concepts of product realization in time. The first production concept was the concept of customization of the products produced in manufacture. The next, more advanced, concept was the concept based on standardization of the product, which widely opened the door to mass production. The next, even more advanced, production concept was modularization of products, which enabled the development of product families in an economic way. Customization of products came back to production scene in a more advanced way, on a higher technological level, since it is now based on new information-communication technologies. Convergence of information-communication technologies enabled integration of all three concepts in a unique production concept standardization – modularization - customization. The above mentioned concept is characterized by production synergy as a result of the integration of its partial concepts.

KEY WORDS: production business system, standardization, customization, modularization, strategy, product

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Introduction

Current economic paradigm of today is represented by economics based on intensive use of knowledge (Tapscott, 1996), in which individual product customers are in a specific way directly included in the production process with their knowledge, information, suggestions and ideas, and thereby actively participate in its realization. Mass production of a large number of homogenous products is in such way replaced by mass production of products made upon request of individual customers, which reflect their requests and taste at large. This paper investigates production concept of realization of a complex product within production business system (PBS). The aim of this paper is to find an appropriate production concept which will enable PBS to suitably respond to the challenges of global environment, and in such way provide their survival, growth and development.

Research Methodology

In this paper, authors present results of conducted theoretical survey of production concepts of realization of a complex product in two different approaches, namely from the historical perspective and from the point of view of characteristics, advantages and disadvantages of production concepts. In that effect, theoretical analysis is used to identify relevant aspects of the concepts of customization, standardization and modularization in the function of realization of a product, such as definition, characteristics, advantages and limitations of the concepts, which determine when and to which extent PBS will apply some of the partial production concepts.

Theoretical Overview

Standardization of products

Generally, standardization is defined as “an activity in determining regulations for general and multiple use, with regard to real or potential problems, so as to obtain optimal arrangement level in the given context” (Galvin, 2001). It consists of formulating, issuing and application of standards on a national, regional and international level. Standards are the output from standardization activities.

Standardization of products is primarily significant for this paper. Standardization of taste, which enabled standardized product design, stands in the core of standardization of products. Standardized product design further enabled mechanized mass production, which then led to mass product distribution. In the scope of contemporary production concept of product realization, standardization is represented in all the spheres of PBS functioning, in other words, we can talk about its almost total horizontal diffusion within PBS.

In a PBS, figure 1, standardization is present at the input of a process, within the very production process, in the management of the process, and also at the output of the process.
Standardization of products strongly impels massification of production. Its advantages are reflected in the following:

1) **product convenience improvement**: easier access to new markets; shortening the time needed for a product to get to a market; presenting new technologies on the market; interoperability of one’s technologies and products with complementary ones; managing financial risk related to innovations; accepting innovations from the customers’ part; licensing patents by referring to them in the standards; technology transfer; better estimate of new technologies.

2) **preventing and removing obstacles in the trade, as well as facilitating industrial cooperation**: supporting the development and promoting innovations; ensuring the quality of a product; increasing security and protection of product customers and environment; improving the image and rating of a PBS; improving technical regulative and stimulating national as well as international competition between suppliers in the same economic branch (ISO/IEC, 2007).

Standardization of products has two main disadvantages:

1. Standardization of products tends to average customers’ needs.

2. Realization of standardized products of mass production has certain irrationalities, especially in the case of registered needs for higher product diversity, that is, development within certain product families.

As a rational concept of overcoming the second disadvantage of standardized production, **modularization of products** is introduced.

*Source: Authors*
Modularization of products

Modularity is a notion which indicates the level up to which the components of a system can be divided and combined again. Industrial design is of importance for this paper, and from that standpoint modularization can be defined as an activity in which structuring of complex products by using constitutive elements – modules takes place (Miller, Elgård, 1998). The term module (Latin modulus) identifies either length measure or standard measure for covering proportions. In context of this paper, module is a component of a product which represents an independent functional unit in relation to it and has a standardized interface, as well as interactions which enable configuration of a complex product.

According to (Florent, 2005), modularization of products is a coherent decomposition of a product in subsystems, made by integrating elements of lower level. These subsystems are named modules and they interact with each other through interface. Compared to standardized product, modularization demands a different approach in product designing (O’Grady, Liang, 1998). Configuring different product families enables introducing flexible structure of a product, that is, using mutual modules and parts across the appropriate product family (Stan, 1997). In such a way, figure 2, modularization of products leads to the development of a product family.

Realizing complex products on modular principle, has its advantages and limitations. The advantages are reflected in the fact that modularity of a product makes the complexity of a product manageable; enables parallel work, as well as the fact that it is more tolerant in respect to uncertainties (Baldwin, Clark, 2001). The disadvantages reflects in higher costs, caused by application of modular structure of products.

Industrial standardization largely enabled satisfaction of the needs of customers whose tastes are rather similar. Modularization enabled further increase in diversity of variety of choice for a customer (the development of product family). However, the question remains: what happens with those customers whose taste deviates from what is offered. Overcoming the above mentioned limitation became possible only with intensive development and convergence of ICT. New ICTs enabled the comeback of customization of products to the scene, by realizing products in the conditions of mass production, highly standardized and backed up by modularization of products.
Customization of products

Customization means that product realization is done according to specific customer demands. In contrast to traditionally standardized production, where producers impose their standard products to customers, customized production is flexible, the products are adapted to the very customer’s demands. Customized product, figure 3, can be perceived as a product modified according to customer’s needs. According to (Sievänen, 2002) “Customization generates higher product differentiation, which furtherly leads to product diversity increase, and starts with negotiations with the customer on the details of the order, which continue in the course of design, production, and sale of the product.”

![Diagram of product customization](image)

Figure 3: Principle of product customization

Source: Authors

Customization implies that application of standard parts maximizes satisfaction of outspoken customers’ demands, and at the same time, it minimalizes technical interventions in the scope of available technical equipment. Thanks to ICT, the producer can establish direct communication with each single end customer, so as to satisfy their specific needs. Customization of products is conducted together with communication customization, as well as with price customization (Wiegran, Koth, 2000).

Customization occurs in different forms, but the one mostly applied practically is mass customization (Stan, 1997), which distinguishes both the advantages of mass production (size economy, continuity), and stability of production process, while paying attention to taste and demands of individual customers. In contrast to the products of mass production, the products realized in the scope of mass customization are put together from wholesale produced parts and modules with the aim to satisfy the needs of an individual customer.

Mass customization can be:

1. **Design customization**, if comprises involving customers in the starting of production process of making the product from the very beginning.

2. **Manufacture customization**, if comprises the possibility of manufacturing a product which we offer to a customer, design of which is defined beforehand.
(3) **Assembly customization**, if comprises the possibility of assembling the product with beforehand defined number of options, by applying standardized components of the product.

(4) **Distribution customization**, if comprises product in which a customer can customize the package, configuration and location of delivery of the product (Squire et al, 2004).

Customization of products has some advantages and disadvantages.

The *advantages* of customization are as follows:

(a) when PBSs are doing *business in classical way*:

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- It can lead to increase in sale;
- It establishes higher intimacy between PBS and a customer; and
- It represents an effective way to obtain valuable information from customers (Sievänen, 2002).

(b) when PBSs are doing *e-business*:

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- It can be used for the support of e-business, like attracting new visitors to the website, converting visitors into loyal customers, increasing the income share from loyal customers, focusing sale activities on products with high margin on loyal customers;
- It offers customized messages which PBS uses to inform the customers on special productive-sales conditions, and reminds them on their important dates (birthdays and other dates...);
- It offers additional privileges to customers for bought products;
- It provides answers to personal questions of customers;
- It gives information on the status of product order;
- It enables on-line customer interface;
- It adjusts the level of presenting to a customer;
- It offers target focused advertising for selected customer group;
- It enables dynamic prices that can be adjusted to the current situation by producer;
- It provides customized prices that producer can apply for different customers at any time (Wiegran, Koth, 2000).

The *disadvantages* of a customization of a product are reflected in the facts that:

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- Implementing customization in PBS demands additional engagement of human resources, primarily in the scope of engineering activities;
- Customization has little effect in production subsystem, but the time of manufacturing parts and modules, as well as the time for additional inspection increases;
- On PBS level, it most often leads to increase in the price, which negatively affects its competitiveness;
- Precondition for its successful realization is previously applied modular design (Sievänen, 2002).
Findings and discussion

The first production concept was the concept of customization of the products, produced in manufacture, when the customer was obliged to go directly to an appropriate craftsman to get the product they needed (by communicating directly). Then the craftsman would adapt the requested product through individual production to the demands of the customer (e.g. shoes, clothes, furniture, house, and so on).

That concept is gradually replaced by production concept of a standardized product, which differs from the previous concept in quantity (mass production), the way of manufacture, price, as well as communication. Enhancement of the quantity of products lowers prices of the products; the market expands beyond the scope of the immediate factory surroundings. Production efficiency is dramatically larger, the advantages of standardization are shown in full, the price of the products is lower, which makes them affordable to a larger number of people, there are different middlemen in the life cycle of a product (wholesalers, retailers, dealers, and so on). This makes communication between the producer and the customer indirect (ANSI, 2011).

The practice of manufacturing more complex products in the conditions of standardized products of mass production showed certain disadvantages of that concept, which are especially reflected in the case of needs for higher variety of products, as well as in the case of averaging the taste of customers.

So as to overcome the first disadvantage of the concept of a standardized product, a new production concept – modularization of products is introduced. Modular structure of a complex product as a system is made of independent, functional units - modules, with standardized interface and interactions, in accordance with product definition. In such way, the enlargement of choice varieties for an individual customer is enabled.

As to overcome the other disadvantage of the concept of a standardized product in the case of averaging the taste of customers, a new production concept based on intensive development of information–communication technologies (ICT) imposed itself as an adequate alternative. New ICTs made customization of products come back (Wiegran, Koth, 2000). In such way, Figure 4, the cycle of production concepts starting from the original customization, via standardization, then via introducing modularization of products, is again closed with the current customization of a product, but on a new basis.

Figure 4: Spiral cycle of production concepts of realization

Source: Authors
Conclusion

So as to adequately respond to the challenges of global environment, PBSs are forced to find an appropriate production concept. Certain partial production concepts dominated in different periods: standardization, modularization and customization. It was only ICT development which enabled an adequate rounding of production concept of product realization and integration of all the three concepts into a unique production concept standardization – modularization - customization.

Dominant production concept of a product realization now becomes the concept of product realization, based on synthesis of standardization, modularization and customization of products, and is characterized by production synergy as a result of the integration of its partial concepts.

In that sense, this paper identifies these relevant aspects of the concept of product realization: definition, characteristics, advantages and limitations. Given that there is no systematized unitary view on integral production concept in relevant literature, this work could represent a theoretical contribution in this field of research.

Identified concept of product realization defines when and how much PBS will apply one of the partial production concepts of customization, standardization and modularization of products. The practical contribution of this paper is reflected in the fact that it can serve as useful guide in strategic management when adopting future strategies in the field of orientation on production concept.
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Customer Satisfaction Impact on Banking Services and Relationship Management Innovation

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Abstract

As changing the culture of the organization is one of the main assessments in a global competing environment, this paper has researched the importance of the customer satisfaction and relationship management in corporate policy of a financial institution, bank from Serbia. For that purpose are presented the core values of the customer satisfaction index and theories, on which the framework of the research is based. Customer Satisfaction Survey was carried out throughout the 2014, targeting all client segments and covering geographical regions where bank operates, based on a random sample, including 700 loan clients of the bank. As the part of the survey an investigating of clients’ drop out reasons, has been realized too. Main findings supported the importance and the possible impact of the Satisfaction customer research results on design of future services, innovations in products and relationship management of the bank has adopted Client Experience Standards after the survey, as well as Corporate Social Performance policy as framework documents for further permanent improving of customers conditions, access to financial services, relationship management and social responsibility of the institution, and contribution to the society.

KEY WORDS: Customer Satisfaction, Social Performance, Bank, Loans, Relationship Management

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Introduction

At the time of the harsh global competition and increasing customer demands, there is no simple solution for changing the culture of the organization, especially banks as financial institutions. The organizations have to manage the changes by continually identifying and coordinating all the parts of organizations and functions of their companies according to the increasing new requirements of business environment that would facilitate sustainable change. At the very least, the banks need to build a strong culture of service and their products, which primarily would include: clearly definition of service standards, all employees, management and customers to be about clearly and consistently communicated, with a greater commitment of executive bodies of banks in promoting the culture that strives to provide the best services. According to the trends in customer satisfaction improvement, many banks and other financial institutions have positive experience of other industries that have adopted the so-called “Chief Service Officer” which increases the visibility of the quality of services and their delivery. The customer satisfaction improvement further requires more sophisticated approach to human resources management, to managing people risk, and improvement of critical functions and roles – the areas of the organization with the biggest impact on service delivery. No doubt, banks still face pressures to primarily achieve a high income, but at the same time are increasing the need to strike the right balance between the interests of banks and clients.

Relationship management in banks has more attention to pay on transactions to be based on creating a true partnership with clients, respecting the clients' needs and priorities over all.

Legal entities as clients of the banks, such as SMEs still complain that banks are not interested enough in better understanding their business and industry, and are not willing enough to support their needs proactively.

Financial and economic crisis caused that investment banking almost don’t exist as there is no much evidence of involvement of banks in monitoring the investment cycle of enterprises, in transition countries such as Serbia. There are a lot of not satisfied corporate customers, as well as family, rural with the communication with banks employees, their understanding the problems of certain industries and businesses. The ability and willingness of banks to design products and services that are aligned with the needs of corporate and individual clients and financial ways of solving their problems, indicates that this is a process. KPMG Survey (2014) indicate that only 29% of legal entities was very satisfied with the capabilities of their banks to comply with their needs, willing to tailor financing solutions to them.

Convenience products are assessed more as one of the most important measures of customer satisfaction. The bank interest rate is more significant with individual clients and retail above the index of satisfaction of the services. Researching the customer satisfaction with the services of financial institutions show the improving trends in satisfaction levels, which is mainly caused by quality of electronic payment and billing capabilities. As good example can be seen findings from Banking Industry Customer Satisfaction Survey 2014 provided by KPNG (KPMG Advisory Services, a Nigerian partnership, member firm of the KPMG network of independent firms affiliated with KPMG International Cooperative), covering 28 cities in 27 states across Nigeria. 20,770 retail banking customers, 3,500 SMEs and about 400 corporate/commercial organizations have been questioned. The survey reflects the perspectives of customers on their preferences, levels of satisfaction and
expectations from their banks. Findings represent the opinions of the customers of each bank, and report about the feelings and broader perceptions of customers with respect to services provided by their banks. The rankings are solely based on the customers’ feedback received from the survey. With the proliferation of digital technology—tablets, bank now encompasses everything from traditional transactions to receiving low-balance alerts to prevent overdraft. Financial technology (‘fintech’) companies have catered to those with ambition through web and mobile apps (e.g. Mint, Personal Capital and BillGuard).

The subject of the research in this paper is connected with the actual trends in corporate banking policy, so treats the qualitative measuring customer satisfaction with the services of the bank from Serbia, which should continue to refer to possible innovations in banking products, as well as in relationship management with an impact on reducing the disloyalty and improving the attractiveness for future clients. The paper is based on theoretical framework of customer satisfaction, emphasizing the performance theory as banks in Serbia particularly are at the very beginning of the corporate social performance philosophy, broader contributions to job creation and poverty reduction with their products and services.

**Literature Overview**

**Definitions**

The marketing and consumer behavior literature has traditionally suggested that customer satisfaction is a relative concept, and is always judged in relation to a standard (Olander, 1977). According to the literature, customer satisfaction is connected with clinging philosophy and as marketing term measures how products or services supplied by a company meet or surpass a customer’s expectation (Grozdanic et al., 2014). It can provide business owners with a metric that they can use to manage and improve their businesses, it is also important indicator of consumer repurchase intentions and loyalty, a point of differentiation, so measuring satisfaction an bank can see how happy its customers really are.

Banking customer satisfaction Index is an indicator connected with the philosophy of growing revenue not come from just new markets or products but rather from the ability to deliver a high quality and differentiated customer experience. The Customer Satisfaction Index (CSI) Framework is the simply a weighted score that assigns importance ratings of banking service measures to the satisfaction ratings of those measures as provided by clients on the loans of their bank. It can be illustrated by the Picture below:
Customer Satisfaction Theories

There are a number of frameworks developed to explain customer satisfaction in the literature. Early researchers, including Engel, Kollat, Blackwell (1968), Howard, Sheth (1969), Cardozo (1965), relied on the dissonance theory developed by Festinger (1957). Subsequent studies (Anderson, 1973; Olshavsky, Miller, 1972) drew on the assimilation-contrast theories proposed by Sherif, Hovland (1961). The theories mostly discussed an used explaining customer satisfaction include mainly ten further theories:

— **The Expectancy-Disconfirmation Paradigm (EDP):** Oliver (1977), drawing on the adaptation level theory (Helson, 1964), developed the Expectancy-Disconfirmation model for the study of consumer satisfaction, which received the widest acceptance among researchers, and proposed the *Expectancy-Disconfirmation Paradigm* (EDP) as the most promising theoretical framework for the assessment of customer satisfaction. The model implies that consumers purchase goods and services with pre-purchase expectations about the anticipated performance. The expectation level then becomes a standard against which the product is judged. That is, once the product or service has been used, outcomes are compared against expectations. If the outcome matches the expectation *confirmation* occurs. *Disconfirmation* occurs where there is a difference between expectations and outcomes. These frameworks generally imply conscious
comparison between a cognitive state prior to an event and a subsequent cognitive state, usually realized after the event is experienced.

— **The Value-Precept Theory**: According to this theory, satisfaction is an emotional response that is triggered by a cognitive evaluative process in which the perceptions of an offer are compared to one's values, needs, wants or desires (Westbrook, Reilly, 1983).

Last decades also saw the development of a number of additional frameworks such as the Attribution Theory, and the Equity Theory for the study of consumer satisfaction.

— **The Attribution Theory**: According to this model, consumers are regarded as rational processors of information who seek out reasons to explain why a purchase outcome, for example dissatisfaction- when the delivery of a service does not match customers’ prior expectations or other standards, customers engage in an attributional process in order to make sense of what has occurred, has occurred. More useful model for applying in ascertaining customer dissatisfaction and complaining behavior (Folkes, 1984; Weiner et al.,1971; Bitner, 1990).

— **The Equity Theory**: According to the theory, satisfaction exists when consumers perceive their output/input ratio as being fair (Swan, Oliver,1989;Oliver, DeSarbo, 1988).

— **The Comparison Level Theory**: argues that there are more than one basic determinants of comparison level for a product: consumers' prior experiences with similar products, situationally produced expectations (those created through advertising and promotional efforts), and) the experience of other consumers who serve as referent persons.

— **The Evaluation Congruity Theory**: ( Sirgy,1984; Chon,1992; and Chon et al.,1998)or the Social Cognition Model treats satisfaction as a function of evaluative congruity, which is a cognitive matching process in which a perception is compared to an evoked referent cognition in order to evaluate a stimulus or action.

— **The Person-Situation-Fit model**: This concept argues that people deliberately seek situations, which they feel match their personalities and orientations (Pearce, Moscardo, 1984; Reisinger, Turner, 1997), mostly used in tourism where individuals make a conscious choice to visit a specific tourist destination.

— **The Performance-Importance model**: This implies that customers’ satisfaction levels are related to the strength of their beliefs regarding attribute importance multiplied by how well these attributes meet their expectations (Barsky, 1992; Martilla, James, 1977; Oh, Parks, 1997).

— **The Dissonance Theory**: suggests that a person who expected a high-value product and received a low-value product would recognize the disparity and experience a cognitive dissonance (Cardozzo, 1965; Yi, 1990), and

— **The Contrast Theory.** According to this theory, when actual product performance falls short of consumer’s expectations about the product, the contrast between the expectation and outcome will cause the consumer to exaggerate the disparity. The Contrast theory maintains that a customer who receives a product less valuable than expected, will magnify the difference between the product received and the product expected (Yi, 1990; Oliver, DeSarbo, 1988). This theory predicts that product performance below expectations will be rated poorer than it is in.
Qualitative Research

Empirical Case Study from Serbia

In line with the Methodology of satisfaction index research, in case study concerning the bank from Serbia, has been used that approach to understand the conditions and needs of clients and to follow-up on highlighted issues. Client Satisfaction Survey was carried out throughout the 2014. As the part of the survey an investigating of clients’ drop out reasons, has been realized too.

Bank has adopted Client Experience Standards which mostly present further contents: Commitment: to be sacrificially committed to loving and serving the poor and marginalized; to live out bank’s core values in its client interactions; to feel that the client’s needs and wellbeing are the inspiration looking for lasting benefit to the client; to feel that staff members are serving the client in humility, having personal dignity and uniqueness; having a vision for positive change in the client’s life – economic, personal, spiritual, and social, supporting the client with training to lift the client’s sights from survival to financial success and provision for others, and ultimately to personal meaning and purpose, etc.

Sampling: The survey was targeting all client segments and covering geographical regions where bank operates, based on a random sample, including 700 loan clients of the bank.

Key findings on client satisfaction

Research on the satisfaction levels of bank clients, has been realized by using the approach to understanding the conditions and needs of clients and to follow-up on highlighted issues. For this purpose, we carried out Client Satisfaction Survey throughout the year targeting all client segments and covering all geographical regions where bank operate, based on a random sample. So far in 2014, 57 client satisfaction interviews were carried out across Serbia (45 men vs. 12 women, 41 agro vs. 16 business clients, 54% of interviewees were 45-60 years old while 35% were 30-45 years old). 100% of clients interviewed would work with bank again, while 55 of them (96%) would recommend bank to a friend or family member. Some of the most relevant answers are presented below:

— Have you reached your business goals?
— Did you improve your family’s living standard?
— What are the best features of bank?
— What are the worst features of bank?

The survey results of the clients’ answers are shown in the pie charts of the Figure 1. Analysis of the answers so far show high satisfaction level of bank loan clients with their relationships with bank staff members i.e. quality of service and information received, as well as with the speed of loan approval (Figure 1). While 81% of clients managed to achieve their business goals with BANK loans, majority (56%) do not think that they were able to improve their living standard after loan utilization, meaning that they were not able to increase their family income. Loan terms (primarily interest rate) are the one thing that bank clients would change if they could and the least liked feature of bank loans, but lack-of outlets, working hours and lack of payment facilities in bank credit offices have also been mentioned frequently.
As the part of the Customer satisfaction survey the basic reasons of clients stopping co-operating with the bank 12 months after the date of their last transaction has been researched. The internal Client Exit Survey was operated by bank based on the telephone interviews with former clients. Client Retention Rate (we named, in shortly CRR) has a growing trend during for the first six month of 2014, until something more than 74% in June. The CRR growing changes could be seen, in a clear way, in the second column of the Table 1. They are also shown in Figure 2 (left chart), together with the corresponding trend-line, i.e. the third degree polynomial that best approximates this series.

Table 1: Client Retention Rate (CRR), the numbers of client exit interviews and drop-out reasons

<table>
<thead>
<tr>
<th>Month</th>
<th>CRR (%)</th>
<th>Loan conditions</th>
<th>Business reasons</th>
<th>Personal reasons</th>
<th>Unprofessional behavior</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>67.30</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>February</td>
<td>68.30</td>
<td>31</td>
<td>90</td>
<td>21</td>
<td>2</td>
<td>150</td>
</tr>
<tr>
<td>March</td>
<td>68.95</td>
<td>51</td>
<td>78</td>
<td>42</td>
<td>3</td>
<td>174</td>
</tr>
<tr>
<td>April</td>
<td>70.02</td>
<td>61</td>
<td>108</td>
<td>88</td>
<td>1</td>
<td>258</td>
</tr>
<tr>
<td>May</td>
<td>70.60</td>
<td>31</td>
<td>43</td>
<td>32</td>
<td>0</td>
<td>106</td>
</tr>
<tr>
<td>June</td>
<td>74.38</td>
<td>40</td>
<td>56</td>
<td>29</td>
<td>1</td>
<td>126</td>
</tr>
<tr>
<td>TOTAL</td>
<td>-</td>
<td>214</td>
<td>375</td>
<td>212</td>
<td>7</td>
<td>814</td>
</tr>
</tbody>
</table>

The following four columns in the Table 1 show, in their headers, the attributive descriptions for clients’ drop-out reasons, as well as the numbers of such clients. From February 2014, when client drop-out started to be monitored until June, 814 client exit interviews were carried out. We can see from the Table above that biggest share (46%) of drop-out reasons refer to the business reasons connected with the clients’ business circumstance (mainly the fact that clients did not need loans, or due to illiquidity or periods of low business activity).
Second most represented cause for clients’ drop-out (27%) are loan conditions, which mostly comprise the interest rate, loan fee or loan amount which some clients considered to be too small. Clients’ personal reasons account for 26% of the clients’ drop out reasons, while unprofessional behavior staff was only recorded in 7 cases (or less than 1%) and in most cases, investigation showed that these complaints were unfounded. Figure 2 (right chart) shows the dynamics of the numbers of drop-out clients during time, for all four mentioned categories. It is obviously that, in contrast to the total number of former clients, these time series do not have such pronounced, growing dynamics.

![Figure 2: Growing trend of CRR (left chart) and exit interviews dynamics, break-down per drop-out reasons (right chart).](image)

In order to further statistical analysis, we carried out the distribution and the correlation structure of these series. For this suppose, we investigated the significance and the differences between the numbers of clients with a various drop-out reasons. More precisely, we analyzed the relationship between the different drop-out reasons, using so-called the Pearson’s product moment correlation coefficients (r). Table 2 illustrates the overall with the statistical significance of .001.

**Table 2: Correlation coefficients between the levels of drop-out reasons**

<table>
<thead>
<tr>
<th>Items (drop-out reasons)</th>
<th>Loan conditions</th>
<th>Business reasons</th>
<th>Personal reasons</th>
<th>Unprofessional behavior</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loan conditions</td>
<td>1.0000</td>
<td>0.7786</td>
<td>0.8740</td>
<td>0.3667</td>
<td>0.9465</td>
</tr>
<tr>
<td>Business reasons</td>
<td>1.0000</td>
<td>0.6399</td>
<td>0.4466</td>
<td>0.8954</td>
<td></td>
</tr>
<tr>
<td>Personal reasons</td>
<td>1.0000</td>
<td>-0.0974</td>
<td>0.9076</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unprofessional behavior</td>
<td>1.0000</td>
<td></td>
<td>0.2467</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
When considering the Loan conditions level, it is found that it is positively related to the all others drop-out reasons. Pearson’s product moment correlation coefficients for these five relationships are: \( r = 0.7786 \), \( r = 0.8740 \), \( r = 0.3667 \) and \( r = 0.9465 \), respectively. Therefore, the highest correlation of Loan conditions is with the Total numbers of former clients (94.65%), followed by the correlation with the Personal and Business reasons (87.4% and 77.86%, respectively). After that, follows the correlation with the Unprofessional behavior level, which is a relatively low (36.67%). Similar conclusion can be made in the case of the Business drop-out reasons. They are high positively correlated with Total numbers of former clients (89.54%), then follows correlation with the Personal reasons (approximately 64%), while the Pearson’s correlation coefficients with the Unprofessional behavior level is less than 0.5. The following, Personal reasons level is highly correlated with the Total number of drop-out clients (90.76%), while the correlation with the Unprofessional behavior is a negative, but almost insignificant (less than 1%, in the absolute values). Finally, between the Unprofessional behavior level, related to the Total numbers of drop-out clients, there is a weak correlation (less than 25%).

**Discussion and Conclusions**

In the Paper has been showed the importance and the possible impact of the Satisfaction customer research results on deign of future services, innovations in products and relationship management of the bank. In that purpose the research is based on relevant literature and theoretical considerations on customer satisfaction, measurement models developed for the purpose and implementation of that philosophy in the practice of the bank from Serbia. A survey based on the proposed model was conducted to 700 clients of bank loans in Serbia (Grozdanic, 1977).

Findings support the general applicability of a SEM depends on the reliability and validity of the modeling results. The proposed satisfaction model exhibits strong explanatory power with its satisfactory reliability and validity results.

Research limitations/implications are in the proposed model, as it was tested on half a year data. It should ideally be tested periodically for different banking sectors with more data, and the index results should be compared.

Practical implications of this study provide very important information for the managers in formulating competitive marketing strategies, as well as corporate social performance strategies. The results show the critical points where the limited resources of the bank should be allocated to improve satisfaction and loyalty. Independent and uniform measurement characteristics of the studied model provide a useful tool for tracking performance and systematic benchmarking over time. It also provides information about the weaknesses and strengths of the bank and its services/loans provided from the eyes of its customers.
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Role of Insurance Companies in Financial Market

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Abstract

The financial market in the broadest sense is an organized place where supply and demand for financial assets meet each other, where we have a price formation of those activities. Financial job market means all institutions and processes by which buyers and sellers of financial instruments connect regardless of the nature of the financial instrument. It allows the free circulation of cash and capital and their routing where these funds can best be utilized.

Modern insurance is no longer of importance only to individuals who are joining in community protected from possible adverse consequences. It is of great significance for a number of subjects, but also for the community.

Due to the fact that insurance forms huge capital which is a part of national savings for impredictable cases, the importance of insurance for the economy of each country is enormous.

The subject of this paper is a theoretical study of the influence of insurance companies on the financial market. By analyzing insurance companies, the aim is to determine how and in what way they affect business of financial market.

KEY WORDS: financial market, offer, demand, insurance, insurance companies, capital

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Introduction

Insurance represents joining of all who are exposed to danger with aim tu mutually bear the burdern if someone suffers some kind of damage. Hence the early idea that people who are threatened by some danger should organize into a community; the community made of contribution of each of them, which would provide sufficient funds to those who were hit by some kind of accident.

The importance of insurance for the insured one is that it helps him secure himself from various risks. Apart from that, he or she can provide existency to the family in case of loss (death, permanent inability to work...) or some travel expenses or similar costs. Modern insurance influences the increase of “freedom and independence of a man”. Freedom is primarily reflected in the possibility that a man is secure from the consequences of their activities if causing damage to another one.

Based on theoretical concepts through the analysis of the insurance companies this paper work will come up with an answer to the question in which way they affect the financial market and how they contribute to its development.

Research in the scientific sense is based on the already well-known theoretical views and concepts on the subject of research and, in its largest part, on focus on empirical research. The scientific objective of this research is to achieve scientific knowledge about the importance of insurance companies and their impact on financial markets.

Social justification arises from the fact that the insurance sector is faced with many problems but also challenges, which is why it is necessary to intensify research efforts that may contribute to a better perception of the current state and prospects of development of the insurance sector and, consequently, Financial Markets as well.

The paper outlines the general hypotheses that: insurance companies have a very significant impact on the financial market of each country.

As a special hypothesis we can highlight:

— capital market growth driven by by the development of insurance.
— insurance companies are one of greatest employers in the world, and thus affect the employment rate, especially in developed countries.
— Huge capital is formed via insurance which affect positively financial flows and financial market.

Market of capital

Together with the market of goods and services and labor markets, financial market is an integral part of the overall market environment. What makes this market different from all the others is that it generally does not have the direct contact between transactors. The market is characterized by high price volatility, where the value of assets determines its future sale price. The future is, by the rule, uncertain, and thus the formed price on the market is uncertain or risky. Highly standardized assets that are traded on financial market and trading system which is mainly done by computers, enable relatively easy performance of a huge number of transactions of great total value. The rapid flow of information present
nowadays on financial markets can very quickly change the image of the market, elevating it to unknown heights or turning off in a very short time.

Financial market allows those who need funds to obtain them and enables those who have excessive funds to earn more by investing. Development, wideness and stability of financial market are of great importance for successful functioning of economy and at the same time they are important indicator of national market development in regards to environment.

Basic role of financial market and, subsequently, the market of capital is performance of efficient allocation of finances through financial institutions, instruments and wide range of financial services, from those decreased to increased ones and to enable easy transaction performances (Brzaković, 2007, pp.18)

The higher the volume stated deficit and surplus, the greater the need for efficient financial markets which will channel excess funds to end users in a simple manner and at the lowest possible cost. Efficient financial markets are undoubtedly important to ensure adequate provision of capital and economic growth in the economy. One of the primary functions of the capital market is to increase the profitability and efficiency of operations, because the capital market provides clear and quick overview of realized rates of return in relation to invested assets and leads to a kind of 'cleansing' of the economic system of inefficient economic entities.

At the same time, the capital market is also a place which assesses management quality issuers. Financial markets mobilize domestic financial savings and provides guidance in the economically and financially most successful entities. The capital market allows successful companies to take over companies that perform poorly due to rehabilitation of those companies. It also provides access to financial markets to finance a wider audience (proprietary democracy) that have good projects and who are not able to finance through banks (Brzaković, 2007, pp.19).

Development of capital market stimulates competition, leads to specialization and division of labor between the stockbrokers which, then, leads to a reduction of costs of financial intermediation. Capital market ensures the solvency of the financial system, and the prerequisite for this is that there is a developed secondary market capital to ensure liquidity of investments, ie. the possibility that investors, if they wish, can turn re-investments into cash.

Development capital market allows easier entry of foreign capital (foreign investment), which is particularly important for countries that have a deficit of necessary financial resources. The capital market provides long-term ownership financing through the application of the sale of shares, thus increasing the issuers’ own permanent capital.

Financing Corporation through the capital market, regardless of the percentage share of such funding in the total volume of financing, has many advantages: it allows obtaining additional external funding for the development and financing of companies growth, the creation of optimal financial structure and achievement of optimal ratio between debt and equity sources and raising funds at favorable financial conditions; it increases the efficiency of management and improves the image of the corporation (Brzaković, 2007, pp.20)

On the other hand, "opening" of companies includes some of the negatives, such as the creation of additional costs due to the obligation of more frequent and more comprehensive presentation to the public of data (report) on business; corporate risk exposure to hostile takeover; exposure of corporations to pressure of broad number of investors.
Insurance companies

These institutions on the contractual basis collect funds at regular intervals. These financial intermediaries that are characterized by a high level of security can anticipate to pay its obligations in the coming years, so unlike depository institutions may not be affected by the current loss. They are not the main concern of achieving liquidity assets, and therefore tend to have long-term investments in corporate bonds, shares and mortgages. (Marović et al., 2009, pp.77)

The insurance industry has a very important role in the financial systems of countries around the world. The world market for insurance year after year records an increasing growth, largely thanks to the opening of the insurance market in developing countries. Insurance markets in developing countries until recently were closed to foreign companies, and therefore, due to the lack of competition and adequate knowledge management, insurance companies were inadequately developed.

The insurance industry today, despite the great importance it has in the developed parts of the world, gets the increasing influence on the markets of developing countries. In developed countries, there is almost no one who does not have one or more insurance policies: life insurance, health insurance, disability insurance, auto liability, auto insurance, fire insurance, etc.

The insurance industry applies for one of the largest employers in the world, taking into account that in developed countries the employment rate in this sector began to decline slightly, while in developing countries, due to large growth potential of their insurance markets, there is an upward trend. The reason for declining growth rates in developed countries is attributed to the development of technologies which enabled insurance companies to handle incoming claims for compensation for damages in simple way, which reduced demand for administrative workers. The process of deregulation that swept through financial markets worldwide has caused a huge competition between the deposit and non-deposit financial institutions, so that commercial banks and brokerage houses have begun to encroach on the parts of the market, which until recently were traditionally reserved for insurance companies.

Insurance companies are considered as financial intermediaries for several reasons. The first reason is that they receive funds from their clients for further investment. Many people use insurance companies as institutions in which they invest most of their savings. Another reason why these institutions can be found as financial intermediaries is that these institutions place invested assets of its clients in a series of investments that will make them some money. So, they take resources from one sector and invest them in another sector.

Insurance companies deal with the risk-taking on behalf of their clients in exchange for compensation in the form of premiums. Insurance companies generate profits by charging insurance premiums that are designed to be sufficient to pay expected claims for damages and to obtain certain profits. (Marvić et al., 2009, pp.79)
Assets of insurance companies

Insurance organizations as legal entities have their property. Assets of insurance organizations constitute the right of ownership on immovable and movable assets, cash, securities and other property rights (Vuković, 2004, pp. 40).

Insurance companies acquire funds from multiple sources. Initial funds consist of assets which founders provide while founding (initial capital), then the money come from collected premiums received for the risks in insurance as well as assets remained as profit at the end of the fiscal year.

The joint stock company sorts the means it deals with into certain funds. According to the Law on Insurance, the funds of insurance companies are (Zakon o osiguranju, 2014, pp. 49):

1. Means of technical reserves
2. Means of guarantee reserves
3. Other insurance means

Initial funds are the resources that the founders provide while establishing an insurance company. Unlike companies engaged in other jobs with the insurance companies, this means these funds must be constant. These are the so called "horizontal tools". They serve as a condition for a particular security of insured person who conclude a contract on the initial period of operations of the new company for insurance. These funds can be used only in exceptional cases and only if there are no other means. It is believed that an organization which uses these funds doesn't fulfill the conditions for business so the liquidation process of such company may begin.

Technical reserves are the assets that consist of: Reserves for unearned premiums, reserves for unexpired risks, reserves for bonuses and discounts, damages reserves, mathematical reserves for insurances where insured ones accept participation in investment risk and reserves for risk equalizations. (Zakon o osiguranju, 2014, pp. 50)

Funds of mathematical reserves are special funds that are formed in insurance companies dealing with insurance of persons. These funds have purpose and so, as a rule, they are on separate account or accounts. They can not be used for any purpose other than to pay the amount of insurance based on life insurance. Compulsory execution is not applicable to them, and they have special treatment in case of bankruptcy of the company engaged in life insurance.

The guarantee reserve are special funds and used for permanent fulfillment of obligations of insurance organizations. The insurance company shall, for permanent fulfillment of obligations and filing of business risks, form a guarantee reserve, in the manner prescribed by law. The guaranty reserve shall consist of a primary capital and supplementary capital, reduced of deductions (Zakon o osiguranju, 2014, pp. 52).
Financial Performance of Insurance Organizations

Insurance organizations in legal matters act with full responsibility. This means that they are responsible for its obligations to third parties with all its assets. It should be noted that shareholders who have established a joint stock company are not liable for obligations of the company. They can only bear the risk in the amount of funds invested in founding. Financial transactions are understood under the term organizational business (revenue and sale of assets, loss coverage and distribution and taxes).

**Income and expenses** - insurance organizations (JSC) receive income from its business operations. Income sources are different. Revenues of insurance companies are made of insurance premiums, and active reinsurance businesses, and perhaps others functional incomes, income from investment activities, financial income, income on the basis of the valuation of assets and other income (Zakon o osiguranju, 2014, p. 59).

Expenditures include costs of an insurance organization in the course of the business year. Expenses include costs for paid damages and the sum insured whether they are direct or for those received in reinsurance or co-insurance, then come the risk premiums submitted in reinsurance expenses for prevention, as well as expenditures for business of insurance organizations (material costs, salaries of employees and all those expenses that have any legal entity), as well as extraordinary expenses and capital losses. Expenses are considered expenses of determining claims incurred, expenses for recourse claims (court fees and costs), costs of expertise in contentious cases and other costs incurred in connection with the evaluation and settlement of claims (Zakon o osiguranju, 2014, pp.59).

Allocations for reserved damages are, at the same time, revenues in the coming year.

**Loss coverage** - Organization for insurance during the annual business can show a loss. Insurance Act lays down rules to cover the loss and sequence of resources that can be used for this purpose. If an insurance organization experience business loss during the year, the coverage is made out of the following sequence: from retained earnings, or surplus, out of the free reserves, the assets of the fund prevention, from the initial fund safety. If it is a mutual insurance company, the loss is covered before using funds from the initial security fund by paying additional contributions of the insured or the proportional reduction of damages to all members, insured ones or a combination of these two methods (Zakon o osiguranju, 2014, pp.61).

The Act further stipulates that the insurance organization is responsible to cover the loss in the business year, and to compensate ("return") means to the initial security fund in the amount that was used to cover the loss. In addition, insurance company obliged to inform the competent authority of finance about the occured loss. The reason for this notice is that the competent Ministry of Finance determines the official who will, at the expense of the organization controlling the implementation of measures, repair or cover the loss.

**Distribution of profit** - Joint-stock insurance company is established in order to profit. Gains of the insurance company are part of the income that remains when covering total expenditure in the accounting period (during the business year). Tax is the first thing to be paid from the profit. The rest of the profit is a part of the deployment, and according to the Law, it is allocated in the following schedule (Zakon o osiguranju, 2014, pp.60)

- to cover the loss from the previous year (if any)
- Dividends and other remuneration to shareholders in proportion to the funds they have invested
— mutual insurance company,
— for the refund of excess contributions of members (policyholders), in proportion to the amount of their contributions,
— the safety reserves, allocations to other funds (fund prevention, means of collective consumption) and in the mutual insurance company for the return of the founding roles with appropriate interest,
— to gain employment in accordance with the collective agreement.

**Business principles** - Insurance organizations and other legal entities are obliged to act in their own business or operate in accordance with certain principles. These are the principles of economy, and the implementation of the profession in the insurance business in accordance with the law and good business practices and business ethics, as well as the principle of fair competition. For insurance organizations, the principle of reciprocity and solidarity is particularly stressed as well as operations in order to ensure continued fulfillment of its obligations.

The obligation of insurance organizations to provide lasting performance of its obligations is legally regulated in the sense that the obligation of the guarantee reserve exists. In addition, insurance is required to take into account whether you can cover all the risks assumed in insurance. If that's not possible, it is obliged to provide them via reinsurance or coinsurance. If the organization is not able to cover all risks with its own funds, a part can be transferred to reinsurers abroad, but only if it is not possible to achieve it within the country.

**Supervision of operations of insurance companies**

Specifics of insurance operations require special supervision over the work of insurance organizations. In most countries, this monitoring is very emphasized through the control carried out by national authorities. National Bank of Serbia monitors every insurance business by the Law on Insurance in Serbia.

National Bank of Serbia monitors performances of insurance branch, i.e. monitors business of insurance companies and reinsurance companies (subjects of monitoring) (Zakon o osiguranju, 2014, pp. 76)

Reasons for increased control of the insurance organization are explained by the following arguments:

— It is necessary to preserve the interests of the insured ones
— It is useful for the insurers as well (competition elimination and rentability providing)
— Governmental interest.

Supervision over the operations of insurance organizations determines in the first place if the general acts, business policy and business insurance organizations are in accordance with the law and the regulations made thereunder.

The control is in the first place legality obedience, ensuring the solvency and liquidity of insurance organizations, preservation of equality of parties, the ban on gambling and betting elements, ensuring fair competition between insurance organizations and so on.

In order to achieve the objectives of the control - monitoring is present in all stages of the existence of insurance organizations and even before that (a requirement for obtaining
the license is the fulfillment of certain conditions stipulated by law). Therefore, the supervision over the operations of insurance organizations can be viewed through three stages:

1. Phase of establishment - the fulfillment of the conditions for the establishment and initial operation of insurance organizations.
2. In the course of operations - control of tariffs of insurance, signed agreements, the obligation to maintain certain funds, the obligation to report on the operations and so on.
3. During the termination of insurance organizations-rehabilitation, withdrawal of license, etc.

Measures for supervision of insurance organizations constitute the whole which consists of:

- special control over the operations of insurance organizations that are engaged in the business of automobile insurance
- mathematical counting (obligations of organizations engaged in the business of life insurance to ensure the actuary, the actuary participation in the evaluation of the annual calculation results and so on.)
- Revision (obligations of insurance organizations to conclude an agreement on the revision of accounting statements.).

Conclusion

The importance of insurance for the insured one is in preventing him/her from various risks. Huge capital is formed by insurance and it represents a part of national savings for unpredictable cases and the importance of insurance for every country's economy is enormous. Assets of insurance organizations constitute the right of ownership on immovable and movable assets, cash, securities and other property rights.

The funds that the founders provided during the establishment of the insurance company make initial stock. Safety reserves consist of assets formed from premiums in the year when the premium is greater than the damage occurred. The funds that are formed in insurance companies dealing with insurance of business men are the life assurance reserves. Guarantee reserve - these are special funds that are used for continuous performance of the obligations of insurance organizations.

Insurance organizations (JSC) gain revenue from its business operations. Income sources are different. Revenues firstly come from collected premiums received for insurance, reinsurance and coinsurance, then revenues from recourse for the paid damage from the responsible persons, and also extraordinary income and capital gains. If an insurance organization, during the year, registers an operating loss, coverage is made out of the following sequence: from retained earnings, or surplus, out of the free reserves, the assets of the fund prevention, from the initial safety fund.

Gains of the insurance company are part of the income that remains when covering total expenditure in the accounting period. Organization for insurance is required to take into account whether it can cover all the risks assumed in the insurance; if not possible, is obliged to provide them via reinsurance or coinsurance.
Supervision over the operations of insurance organizations is determined in the first place if the general acts, business policy and business insurance organizations in accordance with the law and the regulations made thereunder. Insurance companies are required to provide the National Bank of Serbia with data about legality or illegality of the business. Thus, the insurance organizations are obliged to provide the National Bank of Serbia with:

- Annual and business report
- the copy of revision report with the authority’s comment on it
- Comment of the supervisory board, amendments to the business policy.

References


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The Significance of VAT Revenue Streams for the Budget of the Republic of Serbia

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Abstract

This paper analyzes the significance of revenue streams of the value added tax for the budget of the Republic of Serbia. Some 80% to 90% of the budget revenues of the Republic of Serbia are taxes. In fact, value added taxes have been applied in Serbia since January 2005. It would become significant for the Serbian budget when, the same as in France, it makes up 45% of the total revenues. The purpose of this paper is to point out the problems existing in practice during the common tax reforms (usually applied were partial reforms), or to point out the significance of tax policies in the aim of implementing state economic policy. Constant changes in the Law on the Value Added Tax, changes in tax rates, bank account circulations, selective payments—all these have inevitably influenced the amount of the value added tax revenues in the budget of the Republic of Serbia. This paper presents value added tax revenue data until 2013, as well as showing statistical parameters from the analysis of linear trends and the evaluation of the statistic significance with revenue movements until 2025.

KEY WORDS: tax policy, economic policy, value added tax, tax system reform, tax rates

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Introduction

In analyzing the last two decades of tax policy in Serbia, we are witnessing the interchanging of three tax system reforms, with a fourth one on the way. Furthermore, theory and practice differentiate between complete and partial reforms (tax rate, tax base, etc.). However, it is an irrefutable fact that even more developed, economically stronger, institutionally more powerful and better organized countries rarely endeavor to carry out an overall tax reform. In fact, they rarely implement even a partial reform of the tax system. The reasons for this may be found in the operating mode and approach to problems, or in a detailed analysis which precedes every reform.

According to M. Arsić, ‘A tax policy presents one of the most powerful tools for an adequate managing of the macroeconomic policy in Serbia. Considering the mentioned, it is of a crucial importance to make a detailed analysis and open an academic discussion prior to the reform, and to create a quality professional basis based on which state authorities and chosen representatives of citizens could create adequate economic policy measures’ (Arsić, 2011, p. 97).

‘If a society has not completely clearly determined its policy and determined the directions of the development of certain economic and other activities, if an overall vision of the economic, social, scientific, cultural, educational, demographic and any other policy is lacking, it is unrealistic and unjustified to expect tax policy to be in the function of accomplishing such a policy. What's more, the tax policy can be successful and efficient only if other preconditions for accomplishing a wider social policy are met, and especially if the other preconditions possess the same guidelines, tasks and goals’ (Petrović, 1988, p. 20).

‘The financial effect of the tax policy has always been and will always be of an essential importance, regardless of all tax reforms, as without this effect, the functioning of a state cannot be achieved’ (Stevanović, 2012, p. 12).

Value added tax genesis and the tax rate

The value added tax (hereinafter: VAT) is a general tax on consumption which is calculated on the added value that each person paying in the production sales cycle is adding for product and services delivery (Gajić et al., 2012, p. 97).

VAT can be approached from multiple aspects. From the accounting aspect, it is the part or stage in production and sales. From the aspect of the merchandiser, it is the reimbursement on the paid price. VAT is an indirect tax and it is characterized by the following: transferability, as well as the possibility for taxpayers to transfer the burden onto the second person.

VAT consists of several phases, as its realization is divided into payments carried out in each stage of the production and distribution process, but it is accounted only on the net value accomplished in each stage (Karavidić et al., 2013, p. 33).

It is applied in over 120 countries all over the world. It is, however, not applied in the United States of America; actually, it is only applied in the state of Michigan from 1975 under the name ‘single business tax’. VAT started to be applied in France in 1954 due to the efforts of economist Maurice Laure, under the name ‘taxe sur la valeur ajoutee’. At the beginning, it was implemented only for large companies and later on it spread onto all business areas. VAT is significant for France as it brings about 45% of the revenue. Denmark and Brazil introduced VAT in 1967.
By extending the circle of countries which incorporate tax systems, VAT has replaced the cumulative stage taxes (e.g. in Germany, Italy, Belgium, Holland and Spain) or the one stage sales tax in production (e.g. in Great Britain, Ireland and Switzerland) and in retail (e.g. in Sweden and all the former Yugoslav republics) (Popović, 2010, p. 386).

In an effort to align the taxation policy with the European Union, the E3 model has been adopted. The basic principles of this model are the following (Stevanović, 2011, p. 124):

- The net of all stage sales tax,
- Consumable tax type,
- Credit method,
- Destination principle.

The most important directive in the EU is the sixth directive for VAT. Nevertheless, the tax rates vary from country to country. They vary from the most common 15%, to a lowered 5%, up to a maximum 25%. However, specific goods and services cannot be taxed (medical care, insurance, etc.). The standard rate in Austria is 10%, the lowered is 0% and bears the name ‘goods and services tax’; in Montenegro the standard rate is 19%, and there is no lowered rate; in Norway the standard rate is 25%, the lowered rate is 15%, 8%, 0%; in Russia the standard rate is 18%, the lowered rate is 10% and 0%, and it is called ‘налог на добавленную стоимость’; in Turkey the standard rate is 18%, the lowered rate is 8% and 1% and it is called ‘katma deger vergisi’.

VAT has been implemented in Serbia since January 2005 and so far the tax rate has been changed twice. According to the 2004 Law, the general rate amounted to 18%, and the special rate to 8%, while as per the 2014 Law, the general rate is 20% and the special rate is 10%.

A special 10% VAT rate applies to goods and services supply or import of bread and other bakery products, as well as milk and milk products, flour, sugar, edible sunflower oil, corn, rapeseed, soya been and olives, edible fats of animal and plant origin and honey; medicines, products that are surgically implemented in the human body, dialysis materials, textbooks and teaching aids; daily newspapers; firewood; maintenance of public green areas and coastal areas; public transportation in urban and suburban areas (Value Added Tax Law, Official Gazette of the Republic of Serbia, No. 84/04, 86/04 - correction, 61/05, 61/07, 108/13, 68/14 – other Laws).

Considering the fact that seven decades of VAT have transpired, economists, both homegrown and foreign, have been providing specific arguments in favor of and against VAT, i.e. both the advantages as well as the disadvantages.

According to Prof. Raičević, ‘Financial literature offers the following arguments in favor of the value added tax when compared to the retail sales tax’ (Raičević, 2004, p. 114-115):

1. VAT is larger than the retail sales tax.
2. VAT is more efficient in combating evasion and specially in combating illegal tax evasion (contraband and smuggling).
3. The mechanism of VAT provides that exporting is completely liberated from taxes paid in previous stages, which is not possible in the retail sales tax, especially regarding services which are not paid only in truncated consumption.
4. VAT secures that all supplies are freed from taxation, which is not the case with the retail sales tax, considering that reproduction material, but also numerous equipment assets, can be used both in reproduction and in final consumption.
5. Finally, the fifth implementation of VAT represents a prerequisite for joining the European Union.
Nevertheless, its basic flaw lies in the mentioned cumulative effect: as a certain good passed through an increasing number of stages, the overall tax burden increased as well, that is, because each time through the stages, the basis for calculating the sales tax must have included the tax which the supplier transferred to the buyer by way of the costs’ (Popović, 2010, p. 385).

Most economists agree that the basic shortcomings of VAT are high administrative costs, regression, inflationary potential, etc.


Considering 2013, in 2012 the revenues were lowered by 3.1%. Capital revenues recorded a decrease of 43.2%, a donation decrease by 3.3%, and the current revenues i.e. tax revenues decreased by 1.9% and non-tax revenues by 9.9%.

The following figures represent the basic parameters of VAT in 2013 when compared with 2012 (Figure 1).

<table>
<thead>
<tr>
<th>VAT based revenues are lower by 3.9%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net domestic VAT is nominally lower by 3.8%, and 10.7% in real value</td>
</tr>
<tr>
<td>Gross collection of domestic VAT is lower by 2.3%, and nominally higher by 5.3%</td>
</tr>
<tr>
<td>Import VAT records a nominal growth by 6.9%, and fall by 0.8% in real value</td>
</tr>
<tr>
<td>VAT return has achieved a nominal growth by 13.8%, and a growth by 5.6% in real value</td>
</tr>
</tbody>
</table>

*Figure 1: Value added tax 2013/2012.*

*Source: Authors, results based on the Public Finances Bulletin, No. 11, December 2013.*

*Table 1: Index of nominal and real public revenue growth in 2013/2012.*

<table>
<thead>
<tr>
<th>Public Revenues</th>
<th>Nominal growth index 2013/2012</th>
<th>Real growth index 2013/2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Current revenues</td>
<td>104.7</td>
<td>97.1</td>
</tr>
<tr>
<td>1.1 Tax revenues</td>
<td>105.8</td>
<td>98.1</td>
</tr>
<tr>
<td>Personal Income Tax</td>
<td>94.4</td>
<td>87.6</td>
</tr>
<tr>
<td>Income Tax</td>
<td>110.7</td>
<td>102.7</td>
</tr>
<tr>
<td>VAT</td>
<td>103.6</td>
<td>96.1</td>
</tr>
<tr>
<td>Excises</td>
<td>113.1</td>
<td>104.9</td>
</tr>
<tr>
<td>Customs</td>
<td>90.8</td>
<td>84.3</td>
</tr>
<tr>
<td>Other tax revenues</td>
<td>102.0</td>
<td>94.6</td>
</tr>
<tr>
<td>Contributions</td>
<td>110.4</td>
<td>102.4</td>
</tr>
<tr>
<td>1.2. Non-tax revenues</td>
<td>97.1</td>
<td>90.1</td>
</tr>
<tr>
<td>2. Capital revenues</td>
<td>61.3</td>
<td>56.8</td>
</tr>
<tr>
<td>3. Donations</td>
<td>104.2</td>
<td>96.7</td>
</tr>
<tr>
<td>TOTAL</td>
<td>104.4</td>
<td>96.9</td>
</tr>
</tbody>
</table>

*Source: Author, based on data from [www.mfin.gov.rs](http://www.mfin.gov.rs) on 2.2.2015.*
The nominal growth index 2013/2012 was in total 104.4 and the real growth index 2013/2012 was 96.9% (Table 1).

Table 2: Participation of chosen tax types in allocated public revenues for the period 2005 to 2013.

<table>
<thead>
<tr>
<th>Year</th>
<th>Taxes on goods and services (VAT, excises)</th>
<th>Social security contributions</th>
<th>Taxes on income, profit and capital gains</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>40%</td>
<td>29%</td>
<td>15%</td>
</tr>
<tr>
<td>2006</td>
<td>36%</td>
<td>31%</td>
<td>16%</td>
</tr>
<tr>
<td>2007</td>
<td>37%</td>
<td>31%</td>
<td>14%</td>
</tr>
<tr>
<td>2008</td>
<td>31%</td>
<td>27%</td>
<td>13%</td>
</tr>
<tr>
<td>2009</td>
<td>27%</td>
<td>23%</td>
<td>10%</td>
</tr>
<tr>
<td>2010</td>
<td>28%</td>
<td>24%</td>
<td>10%</td>
</tr>
<tr>
<td>2011</td>
<td>23%</td>
<td>18%</td>
<td>18%</td>
</tr>
<tr>
<td>2012</td>
<td>21%</td>
<td>17%</td>
<td>8%</td>
</tr>
<tr>
<td>2013</td>
<td>26%</td>
<td>22%</td>
<td>10%</td>
</tr>
</tbody>
</table>

Source: Author, based on data from www.mfin.gov.rs on 2.2.2015.

Taxes on goods and services (VAT, excises) considering the starting year (2005) recorded an increase in allocated public incomes by 40%, while in 2013 it amounted to 26%. A decline has been recorded within all selected types of taxes in 2013 when compared to 2005 (Table 2).


Source: Authors, based on data in www.mfin.gov.rs


Based on the revenue streams of VAT data, the import VAT and goods and services VAT in the period between 2006 – 2013 within the budget of the Republic of Serbia, and referring to the data in the Public Finances Bulletin, an analysis of the linear trend and statistical importance assessment is presented.
The dependence of the correlation of advent is 0.6433, and it is a positive growing trend. The strength is between 0 to 1, and therefore, the correlation is strong (Graph 2).

Table 3: Coefficients VAT.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Estimate</th>
<th>Standard Error</th>
<th>T-Statistic</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept(a)</td>
<td>73229500</td>
<td>9.44231E6</td>
<td>7.75547</td>
<td>0.0002</td>
</tr>
<tr>
<td>Slope (b)</td>
<td>6151370</td>
<td>1.86986E6</td>
<td>3.28976</td>
<td>0.0166</td>
</tr>
</tbody>
</table>

The table presents the statistical parameters from the linear trend analysis and the estimation of statistical importance. The intercept and the slope of linear trend are statistically important regarding the time period. Based on the previous, it can be concluded with certainty that the value of VAT will grow (Table 3).

Table 4: Revenue stream of VAT in the period 2015–2025 in thousands of RSD.

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>134,743,200</td>
</tr>
<tr>
<td>2016</td>
<td>140,894,570</td>
</tr>
<tr>
<td>2017</td>
<td>147,045,940</td>
</tr>
<tr>
<td>2018</td>
<td>153,197,310</td>
</tr>
<tr>
<td>2019</td>
<td>159,348,680</td>
</tr>
<tr>
<td>2020</td>
<td>165,500,050</td>
</tr>
<tr>
<td>2021</td>
<td>171,651,420</td>
</tr>
<tr>
<td>2022</td>
<td>177,802,790</td>
</tr>
<tr>
<td>2023</td>
<td>183,954,160</td>
</tr>
<tr>
<td>2024</td>
<td>190,105,530</td>
</tr>
<tr>
<td>2025</td>
<td>196,256,900</td>
</tr>
</tbody>
</table>

Source: Authors
Based on the presented formula and calculated data, the annual growth trend of VAT revenue streams until the observed year 2025 are presented (Table 4).

![Graph 3: Time series and line of linear trend of VAT movement related to import of the Republic of Serbia in the period 2005-2013.](image)

Source: Authors

The strength of corellation is 0.8599, and it is a positive growing trend. The strenght is between 0 to 1, and therefore, the corellation is strong (Graph 3).

**Table 5: Coefficient VAT in import**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Estimate</th>
<th>Standard Error</th>
<th>T - Statistic</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept(a)</td>
<td>140229000</td>
<td>1,25387E7</td>
<td>11,1837</td>
<td>0.0000</td>
</tr>
<tr>
<td>Slope (b)</td>
<td>15066000</td>
<td>2,48302E6</td>
<td>6,06761</td>
<td>0.0009</td>
</tr>
</tbody>
</table>

Source: Authors

The table shows the statistical parameters of the linear analysis trend and an estimation of statistical importance. The intercept and slope of the linear trend are statistically important regarding the time period. Based on the previous, it can be claimed with certainty that the parameters of VAT in importing will increase in the following period (Table 5).

**Table 6: Revenue streams of VAT in importing in the period 2015 – 2025, in thousands of RSD.**

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>290,889,000</td>
</tr>
<tr>
<td>2016</td>
<td>305,955,000</td>
</tr>
<tr>
<td>2017</td>
<td>321,021,000</td>
</tr>
<tr>
<td>2018</td>
<td>336,087,000</td>
</tr>
<tr>
<td>2019</td>
<td>351,153,000</td>
</tr>
<tr>
<td>2020</td>
<td>366,219,000</td>
</tr>
<tr>
<td>2021</td>
<td>381,285,000</td>
</tr>
<tr>
<td>2022</td>
<td>396,351,000</td>
</tr>
<tr>
<td>2023</td>
<td>411,417,000</td>
</tr>
<tr>
<td>2024</td>
<td>426,483,000</td>
</tr>
<tr>
<td>2025</td>
<td>441,549,000</td>
</tr>
</tbody>
</table>

Source: Authors
Based on the presented formula and calculated data, the annual growth trend of VAT in import revenue streams until the observed year 2025 can be seen (Table 6).

\[ y = 58239000x + 143977000 \]

\[ R^2 = 0.8931 \]

Graph 4: Time series and linear trend of VAT on goods and services in the Republic of Serbia in the period 2005 – 2013.

Source: Authors

The strength of correlation is 0.8931, and it is a positive growing trend. The strength is between 0 to 1, and therefore, the correlation is strong (Graph 4).

Table 7: Coefficients SUMA

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Estimate</th>
<th>Standard Error</th>
<th>T - Statistic</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept(a)</td>
<td>143977000</td>
<td>3.28115E7</td>
<td>4.38802</td>
<td>0.0046</td>
</tr>
<tr>
<td>Slope (b)</td>
<td>58239000</td>
<td>6.49764E6</td>
<td>8.96309</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

Source: Authors

The table shows the statistical parameters of the linear analysis trend and an estimation of statistical importance. The intercept and slope of the linear trend are statistically important regarding the time period. Based on the previous, it can be claimed with certainty that the parameters of VAT in goods and services in the following period will grow (Table 7).

Table 8: Revenues on goods and services tax in the period 2015-2025, in thousands of RSD

<table>
<thead>
<tr>
<th>Years</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>726,367,000</td>
</tr>
<tr>
<td>2016</td>
<td>784,606,000</td>
</tr>
<tr>
<td>2017</td>
<td>842,845,000</td>
</tr>
<tr>
<td>2018</td>
<td>901,084,000</td>
</tr>
<tr>
<td>2019</td>
<td>959,323,000</td>
</tr>
<tr>
<td>2020</td>
<td>1,017,562,000</td>
</tr>
<tr>
<td>2021</td>
<td>1,075,801,000</td>
</tr>
<tr>
<td>2022</td>
<td>1,134,040,000</td>
</tr>
<tr>
<td>2023</td>
<td>1,192,279,000</td>
</tr>
<tr>
<td>2024</td>
<td>1,250,518,000</td>
</tr>
<tr>
<td>2025</td>
<td>1,308,757,000</td>
</tr>
</tbody>
</table>

Source: Authors
Based on the presented formula and calculated data, the annual growth trend of revenues in goods and services taxes streams until the observed year 2025 can be seen (Table 8).

**Value added tax collection**

For over two decades, Serbia has had selective tax collection. ‘Those who pay will continue to pay, while those who do not pay will also continue to do so.’ This means that the Tax Administration grosses only from those who are recognized as payers. The same practice is also valid for VAT. Also, there is the problem of establishing phantom firms and money launderers. Namely, they leave behind debts in millions of unpaid VAT.

One feature of fraud is that during a certain period of time the firm has an immense turnover, after which it declares insolvency, i.e. a termination of business activities. The most common type of such an enterprise is personified by firms which for a certain period of time show signs of concluding a business cycle - activities are reduced, the enterprise is for the moment frozen, after which, most commonly by changing the founders or authorized person during a short period of time, high amounts of previous taxes are claimed and based on that, demands of VAT return, thereby directly seizing money from public budget funds (Stevanović, 2012, p. 144).

Thereby, it is necessary to reform tax administration, to pass a new law on tax procedure and tax administration, as well as increase the number of employees, all of which means building an efficient tax administration. At the same time, effort needs to be invested in raising awareness, the culture and discipline of the tax payers on one hand, but also of the public in general, when it comes to spending taxpayer money by state organs.

**Conclusion**

It is a necessity to clearly define the measures of the economic policy with the participation of all the interested parties (state, academic community, taxpayers, etc.). A detailed analysis of the previous economic and tax policies must be carried out, as well as the results they have produced in practice. A tax system reform must be implemented (revoking some tax types, changing tax rates, etc.), whose ultimate function is to stabilize public finances, i.e. greater tax revenue streams. In other words: to increase the share of value added taxes in budget revenues, to implement a VAT collection, to produce measures whose ultimate goal is to disable the founding of phantom firms, as well as the occurrence of the so-called money launderers.

Strong state institutions, decades-long existing legislation which must be implemented equally (not selectively) for all participants and the economic life of the state, a stable tax administration, as well as an efficient tax administration - all these are preconditions of stability and safety of business operations, which ultimately result in efficient tax collection, attracting foreign direct investments, creating a favorable business and financial environment, creating new companies and business activities, etc.
References


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Assessment of the Socio-economic Impact of the Chemicals Environmental Contamination

Brnjaš Zvonko\textsuperscript{32}, Ćurčić Marijana\textsuperscript{33}, Stošić Ivan\textsuperscript{34}

Abstract

Socio-economic impact analysis is one of the key components of the complex management process in which risks from environmental contamination by chemicals are identifying and assessing. Paradigm of risk assessment covers four main phases: hazard identification; examination of the relationship between chemical concentration in environment and its adverse effects; exposure assessment and finally, risk characterization. The socio-economic analysis represents the analytical base, funded on the wide body of the scientific and professional knowledge, for initiating the risk management and mitigating adverse processes in environmental contamination situations. The aim of this analysis is to develop strategy and to propose measures to overcome potential risks of environmental contamination. In the article, the specific emphasis is put on the role of the socio economic analysis in the risk management of environmental contamination by hazardous chemicals. The process of socio-economic analysis of hazardous chemicals includes identification of anthropogenic activities in which these chemicals are present, and based on that, the assessment of the environmental changes (pollution) caused by these activities and their adverse impacts on human health, on the environment and on economic development of impacted communities. Number of specific methods and indicators for measuring those effects are developed: they are mainly focused on their quantification and sometimes also on monetization, i.e. expressing them in financial terms.

KEY WORDS: environmental contamination, risk management, hazardous chemicals, ecological accidents, socio-economic impact

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Environmental contamination by chemicals: hazards and risks

Socio-economic impact analysis is one of the key components of the complex management process in which risks from environmental contamination by chemicals are identified and assessed. The aim of this process is to evaluate and to develop set of measures for improvement of the socio-economic situation in smaller and larger communities. This process should include all stakeholders affected by environmental contamination, since only comprehensive approach in risk management would provide sustainable development of the communities. The role of socio-economic analysis in this process is very important – it does represent the analytical base, funded on the body of the scientific and professional knowledge, for initiating the risk management process in assessing the environmental contamination.

Socio-economic analysis is strategically oriented to the development of the society and economy, enabling insight in the current state, identifying the specific issue of interest, and restricting the adverse impact of environmental contamination. The aim of this analysis is to develop strategy and to propose measures for overcoming potential environmental contamination risks.

Ecology, specifically ecotoxicology, is dealing with the adverse effects of chemicals on the environment. In the last few decades there were number of frightful experiences with the global ecological disasters, which unavoidably led to misbalance in eco systems and had as a consequence very negative impact on the human health.

One of the first cases which brought environmental pollution to the public attention was the pollution of Love Canal, on Lake Erie in New York, in the 1970s. From 1942 to 1953, several chemical companies dumped 20,000 metric tons of chemical waste at this site. As a consequence, eighty different chemicals, including dioxins and polychlorinated biphenyls (PCBs), started to leach through the soil, and residents have experienced many unexplainable health problems. Today federal laws stipulate that generators of hazardous waste are responsible for the proper storage and disposal chemicals from the "cradle to the grave." In the following decades environmental accidents continues to happen, among which on the global level the highest level of attention was attracted by the chemical disaster in Bhopal (1984), Chernobyl nuclear disaster (1986), as well as, Mexico gulf oil rig disaster (2010). Even though any of smaller accident should not be neglected having in mind its long lasting consequences to the human health agriculture, economy as a whole, biodiversity and other environmental areas. Moreover, ecological disasters or accidents are not necessary outcome of anthropogenic activities; natural disasters (like volcanic activity, fires, flood etc.) could be also the cause. Floods in Serbia during the 2014 were an example of natural disaster negative influence to living organisms, health of humans and all other relevant factors.

Those, as well as many other, disasters also pointed out the importance of the strategic planning for risk management as a factor in minimizing damage from the accidents and that the socio economic analysis is one of the major components of these plans, in prevention but also in recuperation from their consequences.

The toxic chemicals are of special concerns regarding their effects on environment. They can enter environment, similar like in the case of other accidents, as a consequence of anthropogenic activities or as an unintentional additional effects of various activities.
However, when toxic chemicals enter the environment, they pose potential risk which need to be managed in order to minimize the probability of expression their adverse effects. Data on effects of chemicals on animals, plants and other living organisms are obtaining from standardized ecotoxicological studies and results of those studies actually create a base for risk assessment as first step in the process of environmental contamination management.

**Socio-economic analysis as a part of the risk assessment and mitigation of chemicals adverse effects on the environment**

Paradigm of ecotoxicological risk assessment includes four key steps: first one is hazard identification, second is examination of the adverse effects of the specific concentration of toxic substance on environment; the third one is exposure evaluation and the fourth one is risk characterization. After performing those successive steps in risk assessment and stipulating the risk characterization it could be concluded whether the risks are acceptable for certain targeted living organisms or not. If the results of analysis show that risk is not acceptable it is necessary to take measures for managing the risks of environmental contamination. Socio economic analysis is important and necessary part of this process and it is of great importance to perform it in right time having in minds all relevant factors.

Risk of chemicals contamination could be considered as unacceptable when concentrations of chemicals in certain environmental areas (Predicted Environmental Concentration – PEC) overcome the values for which is confirmed that adverse effect would not appear (Predicted No Effect Concentration - PNEC). Feature of chemicals like persistency reflects their life in the environment, i.e. time necessary to reduce their concentration on the half of the initial concentration. Bioaccumulation and bioconcentration imply potential of chemicals to enter living organisms, for examples concentration in fish could be hundred times higher than in water. Finally, biomagnifications show possibility of chemicals to magnify its presence through the food chain and therefore poses the risk to human health.

Among chemicals, of special concerns are persistent organic chemicals (Organic Persistent Pollutant – POPs) because they have all three mentioned features toxicity, persistency and bioaccumulation. Management of these chemicals is regulated at the international level by adoption and ratifications of Stockholm convention in 2001. Until 2014, convention has been adopted by 179 countries, where Serbia belongs too.

**The content of socio-economic analysis and impact assessment of hazardous chemicals**

The process of socio-economic analysis of hazardous chemicals includes identification of anthropogenic activities in which these chemicals are present, and based on that, the assessment of the environmental changes (pollution) caused by these activities and their adverse impacts on human health, the environment and economic development of impacted communities.
In the context of risk management of these chemicals, the social and economic impacts, among other, may include the following:

— *Deterioration of the health of people:* hazardous chemicals inflict a series of adverse effects on the health of people out of which many have been already confirmed by research, laboratory tests and long years of experience in various parts of the world;

— *Loss or increase of means of living:* hazardous chemicals may deteriorate people health and thus reduces their ability productively to work and provide means for their living; also, they may also significantly damage natural resources and so reduce the sources of livelihood for individuals and their communities; at the same time, we should bear in mind, that some activities involving the use of chemicals may represent a significant source of specific benefits for certain social groups;

— *Changes in costs of living:* the above said impacts may sometimes, due to their nature, generate extremely high costs, such as costs of medical treatments, loss of working days due to sick leaves, costs of treatment of the polluted water and air, etc.

— *The level of child labour:* activities related to hazardous chemicals often involve child labour, this is particularly true for underdeveloped and developing countries;

— *Changes in the degree of balanced distribution of social wealth:* many activities (particularly in the domain of agriculture) are the sources of income of poorer classes of society, and any threat to them may also additionally worsen their situation;

— *Opportunities for development of companies (including small and medium-sized enterprises):* in addition to number of adverse impacts on economy, activities
which result in the presence of POPs may be an opportunity for SME, e.g. the area of recycling and remediation of negative effects of POPs;

- **Changes in demand for public services, such as health care and education and infrastructure:** hazardous chemicals, directly or indirectly, may affect the health care sector (specific capacity for remediating of damages caused by these chemicals need to be provided), the education (the skills and knowledge required to treat chemicals need to be developed), as well as building specific technical capacities to treat them adequately;

- **Impact on vulnerable segments of society:** given the diversity and scope of impact of POPs, we may talk about their impact on vulnerability of individuals and society as a whole, that is, impact in terms of disruption of stability and sustainability of social systems and their subsystems;

- and others.

All these aspects have been the focus of specific research efforts, but the strongest emphasis is put on the assessment of chemicals impact on the health of people, particularly their impact in the workplace. There are numerous researching activities which have been focused on the effects which chemicals have on the eco-system and somewhat lower number of researching activities which have dealt with their economic development impact.

Numerous methods and specific indicators for measuring the effects of hazardous chemicals on society can be found in reference books and publications. They are mainly focused on quantifying of those effects by applying specific measurement units and sometimes they are also used for monetizing them, i.e. presenting them in terms of financial units.

**Conclusion**

In conclusion, it should be said that socio economic analysis is important and necessary part of the chemical risk management in ecotoxicology. It is important to predict all necessary preventive measures and perform them on time in order to manage the risk. Showing the whole aspects of socio economic analysis, and pointing out the extent in which it can contribute to the decision making in risk management, we expect that we have sufficiently emphasized necessity for use of this approach in all further accidents, especially in preparing strategic plans for accidents management, where beside economic and financial benefits, reduction of environmental contamination could bring invaluable society benefits.

Generating of the environmental pollution in the modern societies is unavoidable and industrial nations will always produce a certain level of pollutants. Some of the pollutants, even potentially very harmful to the environment are at the same time very beneficial for individuals and communities. The good examples are the pesticides, which besides their potential harmful effects, at the same time, have greatly contributed to the increase of overall food production in the world; the pharmaceuticals, which require potentially dangerous organic chemicals for their manufacture, at the same time considerably have extended human lives; plastics, one of the main environmental pollutants all over the world, are used in all aspects of medical and domestic life, etc. What modern societies need to do is to find an optimal balance between the attempts to minimize the costs and to increase profits in manufacturing numerous consumer and industrial goods and requesting industries and individuals to reduce pollution in their operations.
References


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Analysis of bioenergy production from Miscanthus grown on degraded area of landfill of Prelići, Čačak

Dimić Goran35, Varadanin Vladimir 36, Todorović Aleksandar37

Abstract

As befits the subject matter, this paper analyse the results of biomass Miscanthus’s production on degraded area of Prelići landfill Čačak and also experimental parcels near the town. Main goal of this paper is to establish the possibility of using energetical plants like these ones on degraded areas or lower quality lands. Analysis of the results shows us that it is possible to use biomasses as an alternative source of energy. By doing that, fertile grounds can be saved for production of food. First part presents the way of forming plants. Analysis of achieved results in 2012 is showed in second part, and in a third one is analysis from year 2013.

KEY WORDS: biomass, Miscanthus, energetical plants

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620.952(497.11)

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Introduction

RS Energy Development Strategy by 2015 ('Official Gazette' 35/05) promotes and encourages projects in the field of renewable energy sources (RES) so as to reduce energy dependence and promote rational use of fossil fuels. Local municipalities and their activities are very important for the application of this strategy. Having recognised the importance of reducing energy dependence, the town of Čačak has given the support to some energy efficiency projects. The Strategy of Sustainable Development of the town of Čačak is another document that helps to reduce energy dependence and is in agreement with the Biomass Action Plan. PUC 'Komunalac' Čačak, founded by the town of Čačak, have elaborated the project 'Establishment of biomass on degraded area of Prelići landfill' and the town of Čačak and Ministry of Environment have supported this project.

The idea of biomass production on degraded soils is based on the fact that the energy from these energy resources is pure energy. Providing pure energy by new technologies is realized through a zero carbon emission along with much lower sulphur dioxide and nitrogen oxide emissions.

As it is generally known, biomass is renewed faster than fossil fuels and its growth is easily controlled, though its quantities are limited. Active use of biomass residues, primarily forest resources, can damage the environment and induce landslides, soil erosion, etc. The potential for the use of biomass in our country has not been sufficiently explored, therefore it is necessary to establish biomass plantings but not to the detriment of food production acreages.

PUC ‘Komunalac’ Čačak has been allotted by the town of Čačak to manage the landfill of Prelići. The landfill (280,000 m²) was initiated in 1973. The formation of the Regional Landfill ‘Duboko’ has provided conditions for closing down the Prelići landfill and has initiated re-cultivation of the entire surface for other purposes. The principal idea of the management board of PUC ‘Komunalac’ Čačak was to establish biomass production on the landfill, reduce the dependence on suppliers of fuels currently used for heating and, finally, cut down energy costs. Fuel prices are on the rise daily, the delivery is uncertain often depending on movements on the European and global markets. On the other hand, there is the consensus about the importance of active participation in environmental protection.

Material and methods

Energy plantings have a positive effect on environment and ecology in general as they serve as a means of rebuilding the degraded areas, re-cultivation of landfill Prelići in this particular case. Heat value of energy crops is high, ranging 15–20 MJ/kg dry weight, while heat value of lignite-coal is about 10.5 MJ/kg.

The economy of energy plantings targets to a 20-year exploitation period. The technology of establishment of these plantings is cheaper than the one used to exploit other forms of renewable energy such as waterpower plants, solar panels or wind generators. Globally, there are a number of energy crops cultivated.
Table 1: Major characteristics of biomass products originating from energy crops

(TENBIORE project 2011)

<table>
<thead>
<tr>
<th>Agricultural by-products</th>
<th>Annual average yield (t d.m./ha)</th>
<th>Water content at the harvesting time (%)</th>
<th>Theoretical energy output (GJ/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemp</td>
<td>5-15</td>
<td>50-60</td>
<td>128-270</td>
</tr>
<tr>
<td>Giant reed</td>
<td>15-35</td>
<td>50-55</td>
<td>240-600</td>
</tr>
<tr>
<td>Miscanthus</td>
<td>15-25</td>
<td>15-20</td>
<td>260-440</td>
</tr>
<tr>
<td>Switchgrass</td>
<td>10-25</td>
<td>15-20</td>
<td>174-435</td>
</tr>
<tr>
<td>Poplar</td>
<td>8-20</td>
<td>50-60</td>
<td>144-360</td>
</tr>
<tr>
<td>Willow</td>
<td>10-15</td>
<td>50-60</td>
<td>178-276</td>
</tr>
<tr>
<td>Robinia (Black locust)</td>
<td>10-13</td>
<td>50-60</td>
<td>128-270</td>
</tr>
</tbody>
</table>

Characteristics of some biomass products from energy crops are given in Table 1. The criteria for the selection of an energy plant for planting establishment include as follows:

— Annual biomass yield;
— Moisture content at harvest time;
— Economic component of establishing and maintaining crops;
— Ecology and environmental protection.

The comparison of the given energy plants parameters and best growing practices recommend Miscanthus x giganteus as a favourable energy plant.

Planting establishment of Miscanthus x giganteus

Miscanthus x giganteus plant is a perennial, fast-growing hybrid grass that is native to Asia. It originated from the crossing of Miscanthus x Sacchariflours (diploid) and Miscanthus sinensis x (tetraploid).

In its appearance, Miscanthus X giganteus resembles Johnson grass and Italian cane. However, Miscanthus reaches even up to 4 metres in height, developing vigorous foliage as well as parenchyma inside the tree which gives it strength. Plants develop from rhizomes or underground rhizomes which do not spread uncontrollably into adjacent areas. It is recommended that planting establishment be at soil temperatures lower than 10°C, i.e. April or early May, in Serbia (Bellamy et al., 2009)

Figure 1: Biomass fuel and Miscanthus Pellets (8 mm)
If planting establishment is too early there is a risk of late frost damage, if planted too late, it may result in plants die back. Given low temperatures during dormancy, it is recommended that plants are planted deeper or covered with a protective layer of straw (Clifton-Brown, 1997). Growing period is from early April, while harvesting is in mid-February or early March the following year, as humidity is lowest over that period.

The following aspects of Miscanthus X giganteus render it an environment-friendly crop (Clifton-Brown et al., 2001; Clifton-Brown et al., 2000; Christian et al., 2008)

- Increases soil fertility and through the root system provides uptake of water and harmful substances from the deeper areas of the soil;
- Improves morphological and microbiological soil properties;
- Being a perennial plant it allows the accumulation of plant layer;
- Its vigorous foliage provides habitat for birds and mammals not being a competitive food crop;
- has zero CO₂ emission.

It was observed that rhizomes-propagated Miscanthus X giganteus is less prone to frost damage compared to micropropagated Miscanthus x giganteus. Optimum planting density is 1 to 2 plants per m². Crop growth is initially slow due to low resistance to cold. Fully grown crop grows up to a 3–4 m height by the end of growing period, whereas the annual dry matter yield ranges from 10–30 t/ha, varying by agro-environmental conditions. Growing period is between the latest spring and the earliest autumn frosts (DEFRA, 2007; El Bassam, 2001; Eppel-Hotz, 1998).

As plants grow, the aboveground biomass is growing faster in all aspects from the third growing period onwards. Full potential of Miscanthus is achieved from second to fifth leaf, depending on climatic conditions. Typically, maximum yield is reached in the second year in the southern EU countries, and the fifth in northern ones.

Quality and quantity of biomass of Miscanthus x giganteus is closely associated with harvesting time. Late September and early November is the period of maximum biological production. Over this period, the crop has high moisture content (about 60%) therefore is not suitable for storage and use (burning bales, briquette production, etc). Additional artificial drying of biomass raises final production costs. Delayed harvesting lowers the content of moisture and unfavourable components, improves quality of biomass burning, consequently leading to aging of leaves, shedding of plant tops and yield decrease.

The European Miscanthus Productivity Network reported on yields ranging from 7.7 to 26.3 t/ha in three-year old crops (Semere, Slater, 2007).

*Figure 2: Current state at the planting site of Prelići landfill*
With regard to storage of harvested plant material, moisture content is a very important factor. High moisture content can promote development of mildew and mould leading to spontaneous burning in storage. Analyses show that Miscanthus can be safely stored after drying down to 15% moisture in open field or in a ventilated warehouse. If complete drying in the field is not available, additional drying is needed immediately after harvesting (if moisture content exceeds 25%), or during storage (if moisture content is up to 25%), if there is ventilation. At moisture contents in excess of 25% without ventilation the risk of spontaneous self-burning of stored plant material is possible (Semere, Slater, 2007).

Energy crops and biomass plantations have been established on several locations with different soil characteristics and altitudes for the research and promotion (Table 2).

<table>
<thead>
<tr>
<th>No</th>
<th>Planting site</th>
<th>Surface (acre)</th>
<th>Number of Rhizomes</th>
<th>Altitude (m)</th>
<th>Planting orientation</th>
<th>Germination percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Prelići landfill</td>
<td>200</td>
<td>26.130</td>
<td>260</td>
<td>W-E</td>
<td>80-90*</td>
</tr>
<tr>
<td>2.</td>
<td>Zablaće</td>
<td>2</td>
<td>250</td>
<td>230</td>
<td>S</td>
<td>80</td>
</tr>
<tr>
<td>3.</td>
<td>Gornja Gorevnica</td>
<td>1</td>
<td>120</td>
<td>317</td>
<td>S-E</td>
<td>80-90</td>
</tr>
<tr>
<td>4.</td>
<td>Rošci 1</td>
<td>3</td>
<td>380</td>
<td>593</td>
<td>S-W</td>
<td>80</td>
</tr>
<tr>
<td>5.</td>
<td>Rošci 2</td>
<td>2</td>
<td>250</td>
<td>762</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>6.</td>
<td>Sime Šarage</td>
<td>1</td>
<td>120</td>
<td>242</td>
<td>W-E</td>
<td>90</td>
</tr>
<tr>
<td>7.</td>
<td>Slatina</td>
<td>2</td>
<td>250</td>
<td>263</td>
<td>W</td>
<td>60-70</td>
</tr>
<tr>
<td>8.</td>
<td>Trbušani</td>
<td>2</td>
<td>250</td>
<td>257</td>
<td>S-W</td>
<td>80</td>
</tr>
</tbody>
</table>

* die back of individual plants at a plot part

With regard to the facts above, the location of the Prelići landfill is of particular importance for the project. Analysis of the other locations revealed that Miscanthus should not be grown at altitudes exceeding 593 meters, e.g. at Rošci 2 site no rhizomes were successfully grown. The locations above also differ in soil characteristics therefore soil analysis on these locations was done and compared with that of Prelići landfill. The comparison of the results showed that additional fertilization to increase yields is not required on the latter. Additionally, soil analyses and theoretical data infer that Miscanthus is tolerant of a wide range of pH values, but also suggest that optimal pH ranges between 5.5 and 7.5 (Pude et al., 1997).
**Analysis of achieved results in 2012**

It is important to mention that year 2012 was extremely dry which is negative affected the crops, so in the analysis we can this year count as zero. By controlling the parcel in November 2012, it was found that the rhizomes are not dried up and that they are alive.

*Table 3: Analysis of the parameters of height and trunk diameter, length and width of the list obtained by measuring in period 14-22.06.2012.*

<table>
<thead>
<tr>
<th>Planting site</th>
<th>Height parameter tree (cm)</th>
<th>Parameter Diameter tree (cm)</th>
<th>Parameter length list (cm)</th>
<th>Width parameter list (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prelići landfill</td>
<td>12.11</td>
<td>0.52</td>
<td>30.6</td>
<td>1.08</td>
</tr>
<tr>
<td>Zablaće</td>
<td>16.98</td>
<td>0.59</td>
<td>43.4</td>
<td>1.15</td>
</tr>
<tr>
<td>G. Gorevnica</td>
<td>18.06</td>
<td>0.45</td>
<td>41.5</td>
<td>1.24</td>
</tr>
<tr>
<td>Rošči 1</td>
<td>7.62</td>
<td>0.37</td>
<td>29</td>
<td>1.07</td>
</tr>
<tr>
<td>Rošči 2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Slatina</td>
<td>17.12</td>
<td>0.46</td>
<td>44</td>
<td>1.17</td>
</tr>
<tr>
<td>Sime Sarage</td>
<td>21.15</td>
<td>0.59</td>
<td>47.7</td>
<td>1.22</td>
</tr>
<tr>
<td>Trbušani</td>
<td>8.15</td>
<td>0.37</td>
<td>29.5</td>
<td>0.978</td>
</tr>
</tbody>
</table>

Table 3. shows us the development of the plants, which we obtained by measuring of height and trunk diameter, length and the width of list two months after planting

**Analysis of achieved results in 2013**

According to the soil analysis from 2012, it was decided that the parcels not perform further fertilization in order to increase yields in 2013. year.

After a relatively mild winters, controlling the planted locations, it was found that rhizomes are not freeze.

A large amount precipitations is suitably influenced on the crops, and it was determined that each of the rhizomes planted in 2013, has developed from 6 two 11 Miscanthus outcrops, figure 4.

The experimentally, in April 2013., we performed the planting of rhizomes (produced on the land Sime Sarage) older one year in land fill site Prelići.

*Figure 4: Miscanthus filmed 26.06. 2013. in the landfill site of Prelići*
In the time from 21 to 26.06.2013. was performed monitoring the state of plantings at all sites. For all plots showed the increased presence of weeds, but could not access treatment with herbicides. Also, it was determined that Myscantsus struggling with the same and develops faster and better from weeds.

Based on the been stated previously table 4 shows the condition of the plants, one year after planting at all sites. Parameters were obtained by measuring of height and trunk diameter, length and width of the sheet.

Table 4: Analysis of the of parameters of height and stem diameter, leaf length and width obtained by measuring a period of 21 to 26.06.2013

<table>
<thead>
<tr>
<th>Planting site</th>
<th>Height parameter tree (cm)</th>
<th>Parameter Diameter tree (cm)</th>
<th>Parameter length list (cm)</th>
<th>Width parameter list (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prelići landfill</td>
<td>50</td>
<td>0.6</td>
<td>60,60</td>
<td>2,00</td>
</tr>
<tr>
<td>Zablaje</td>
<td>159</td>
<td>1,40</td>
<td>85,9</td>
<td>2,26</td>
</tr>
<tr>
<td>G. Gorevnica</td>
<td>137</td>
<td>1,2</td>
<td>80,00</td>
<td>2,39</td>
</tr>
<tr>
<td>Rošci 1</td>
<td>57,5</td>
<td>1,0</td>
<td>61,10</td>
<td>2,20</td>
</tr>
<tr>
<td>Rošci 2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Slatina</td>
<td>130</td>
<td>1,20</td>
<td>84,1</td>
<td>2,30</td>
</tr>
<tr>
<td>Sime Sarage</td>
<td>162</td>
<td>1,50</td>
<td>88</td>
<td>2,36</td>
</tr>
<tr>
<td>Trbušani</td>
<td>129</td>
<td>1,30</td>
<td>79,50</td>
<td>2,30</td>
</tr>
</tbody>
</table>

Conclusion

Based on achieved results we have presented in this paper, we verify the possibility of the production of energy plantings in the landfill but also at other locations. Also, we may conclude that in location Rošci 2, which is 593 meters above sea level, could not in time being establish miscanthus.

Relatively mild winter and spring 2013th with plenty precipitations helped plant Myscantsus-a (rhizomes) that not freez and that again developed very well during the growing seasons. Therefore, favorable climatic conditions plenty of the precipitation are positively influenced on the crops which can be conclude by comparing of the results obtained in 2012th and 2013th

Finally, we can conclude that is confirmed the possibility of establishing energy plantings on degraded areas. The study found that there are certain problems in the establishment of energy crops plantings in the territory of the landfill – substantial die back of plants was observed, which is the indicative of existing activities within the landfill. Similarly, severe drought during growing period does not favour plant growth. A heavy dependence on water supply was also evidenced because the landfill soil is composed of various animal, communal and industrial wastes which make it quite porous. These facts call to attention when estimating yields, as no precise conclusions can be made at this point.

More accurate results on yields and the possibility of using this biomass for heating will be determined at the end of 2014.year when will be done with the analysis on heavy metals. Also, we should mention the fact that 900 000 ha of land in the Republic of Serbia not been processed, out of which about 300 000 ha of degraded or low-quality.
References


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