

# ЕКОНОМИКА

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МЕЂУНАРОДНИ ЧАСОПИС  
ЗА ЕКОНОМСКУ ТЕОРИЈУ И ПРАКСУ И ДРУШТВЕНА ПИТАЊА



# ЕКОНОМИКА

Часопис излази четири пута годишње

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1. Часопис “Економика” покренут је јула 1954. године и под називом “ Нишки привредни гласник” излазио је до јуна 1957. године, а као “Привредни гласник” до краја 1969. године. Назив “Наука и пракса” носио је закључно са бројем 1/1973. год. када добија назив “Економика” који и данас има.

2. Часопис су покренули Друштво економиста Ниша и Друштво инжењера и техничара Ниша (остало као издавач до краја 1964. године). Удружење књиговођа постаје издавач почев од броја 6-7/1958. године. Економски факултет у Нишу на основу своје одлуке броја 04-2021 од 26.12.1991. године постао је суиздавач “Економике”. Такође и Економски факултет у Приштини постао је суиздавач од 1992. године. Почев од 1992. године суиздавач “Економике” је и Друштво за маркетинг региона Ниш. Као суиздавач “Економике” фигурирали су у току 1990-1996. године и Фонд за научни рад општине Ниш, Завод за просторно и урбанистичко планирање Ниш и Корпорација Винер Брокер Ниш.

3. Републички секретариат за информације СР Србије својим Решењем бр. 651-126/73-02 од 27. новембра 1974. године усвојио је захтев “Економике” за упис у Регистар новина. Скупштина Друштва економиста Ниша на седници од 24. априла 1990. године статутарном одлуком потврдила је да “Економика” има статус правног лица. На седници Скупштине Друштва економиста Ниш од 11. новембра 1999. године донета је одлука да “Економика” отвори посебан жиро-рачун.

4. Према Мишљењу Републичког секретариата за културу СР Србије бр. 413-516/73-02 од 10. јула 1973. године и Министарства за науку и технологију Републике Србије бр. 541-03-363/94-02 од 30. јуна 1994. године “Економика” има статус научног и ранг националног часописа “Економика” је поћев од 1995. добила статус међународног економског часописа.

5. УРЕДНИЦИ: др Јован Петровић (1954-1958), Миодраг Филиповић (1958-1962), Благоје Матић (1962-1964), др Драгољуб Стојиљковић (1964-1967), др Миодраг Николић (1967-1973), др Драгољуб Симоновић (1973-1984), др Миодраг Јовановић (1984-3-4/1988) и др Драгољуб Симоновић (1990-до данас).

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1. The journal EKONOMIKA was initiated in July 1954. It was published as "Nis Economic Messenger" till June, 1957 and as "The Economic Messenger" till the end of 1969. The title "Science and Practice" it had till the issue 1/1973 when it changed its name into EKONOMIKA as it entitled today.

2. The Journal was initiated by the Society of Economists of Nis and the Society of Engineers and Technicians of Nis (the latter remained as the publisher till the end of 1964). The Society of Accountants became its publisher starting from the issue no. 6-7/1958. The Faculty of Economics, Nis, on the basis of its Resolution No. 04-2021 from December 26, 1991, became the co-publisher of EKONOMIKA. Likewise, the Faculty of Economics of Pristina became the co-publisher since in 1992. Starting from 1992, the co-publisher of EKONOMIKA has been the Society for Marketing of the Region of Nis. Other co-publishers of EKONOMIKA included, in the period 1990-1996, the Foundation for Scientific Work of the Municipality of Nis, the Institute for Spatial and Urban Planning of Nis and the Corporation Winner Broker, Nis.

3. The Republic Secretariat for Information of the Socialist Republic of Serbia, by its Resolution No. 651-126/73-02 from November, 27, 1974, approved of EKONOMIKA's requirement to be introduced into the Press Register. The Assembly of the Society of Economists of Nis, at its session on April 24, 1990, by its statutory resolution, confirmed the legal status of EKONOMIKA. At the session of the Assembly of the Society of Economists, Nis, on November 11, 1999, the resolution was adopted the EKONOMIKA was to open its own bank account.

4. According to the Opinion of the Republic Secretariat for Culture of the Socialist Republic of Serbia No. 413-516/73-02 from July 10, 1973 and the Ministry for Science and Technology of the Republic of Serbia No. 541-03-363/94-02 from June 30, 1994, EKONOMIKA has the status of a scientific and national journal. Starting from 1995, EKONOMIKA has been having the status of international economic journal.

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## ASSESSMENT OF INVESTMENTS BY THE USE OF SOFTWARE APPLICATION FOR DEVELOPMENT OF THE BUSINESS PLAN IN AGRICULTURE<sup>2</sup>

### Abstract

*In order to meet the requirements of more and more finicky customers, both on the domestic and foreign markets, the strengthening of the domestic economy competitiveness, imposes, besides all, the need for programs that will improve agricultural and rural development. Accordingly, it was done the software application for development of business plan in any field of agricultural production and rural economy. In this research, focus was turned on the economic efficiency of investments made in crop production. Specifically, the effects of the investment in agricultural land and mechanization for crop production were assessed. It was done by static and dynamic methods, as well as methods for investments assessment under uncertainty. In all three cases, the assessment of the project effects (including or excluding the time factor) indicates the justified investments.*

**Key words:** *economic effectiveness, investments, business plan, agriculture*

**JEL classification:** D13, G11

## ОЦЕНА ИНВЕСТИЦИЈА ПРИМЕНОМ СОФТВЕРСКЕ АПЛИКАЦИЈЕ ЗА ИЗРАДУ БИЗНИС ПЛАНА У ПОЉОПРИВРЕДИ

### Апстракт

*Да би се испунили захтеви све више пробирљивих купаца, како на домаћем, тако и иностраном тржишту, јачање конкурентности домаће економије, намеће, поред осталог, потребу за програмима који ће унапредити пољопривредни и рурални развој. Сходно томе, израђена је софтверска апликација за израду бизнис плана у свакој области пољопривредне производње и руралне економије. У овом истраживању, акценат је стављен на економску ефективност инвестиција у области биљне производње. Конкретно, ефекти пројекта куповине пољопривредног земљишта и набавке механизације за ратарску производњу су оцењени помоћу статичких и*

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<sup>2</sup> Paper is a part of research on the projects: III 46006 - Sustainable agriculture and rural development in function of the Republic of Serbia strategic goals achievement within the Danube region, financed by the Ministry of Education, Science and Technological Development of the Republic of Serbia, as well as Improvement of financial knowledge and recording on agricultural holdings, financed by the Ministry of Agriculture and Environmental protection of the Republic of Serbia.

*динамичких метода, као и методе за оцену инвестиција у условима неизвесности. У сва три случаја, оцена ефеката пројекта (са или без употребе фактора време) указује на оправдано инвестиционо улагање.*

**Кључне речи:** *економска ефикасност, инвестиције, бизнис план, пољопривреда*

## Introduction

In conditions imposed by the postulate of business oriented to market, investments should be realized in a form that will ensure the investment object's maximum effectiveness of exploitation, or the highest possible level of achieved effects per unit of invested financial assets.

Investment decisions in agricultural practice, regardless of the economic conditions, should be always based on rigorous quantitative and qualitative regulations, which will provide precise allocation of financial expenditures, or investing in the best (most effective) project variants (Rajnović, Subić, Zakić, 2016).

Observing the sector of agriculture, the entity that invests financial assets in order to obtain the necessary production resources which will be exploited during the longer period is called investor (entity could be a family agricultural holding, enterprise or entrepreneur).

In the interest of safety that financial assets are properly invested, so they will achieve the best possible results, both to direct investor and entire society, investor has to use appropriate methods, techniques and models for assessment of investments economic efficiency (Subić, Umihanić, Hamović, 2008).

Methods for assessment of investments are important not only at the farm level, but also in general assessment of sustainable development (social, economic and environmental) at the micro level.

Main goal of this research is to highlight the significance of the investment's economic efficiency for the sustainable development in the sector of agriculture, as well as the importance of the program for development of financial knowledge and recording at the agricultural holdings. Consequently, special attention is given to the software application for the assessment of a business plans at the agricultural holdings in the Republic of Serbia, which is based on the methods for assessing the economic efficiency of investments at the micro level (Cicea, Subić, Cvijanović, 2008), such are:

- static methods for assessment of investment projects;
- dynamic methods for assessment of investment projects;
- methods for assessment of investment projects under uncertainty.

Specifically, in this research was used an Excel software application for the business plan development in any sector of agricultural (crop and livestock) production.

## Data sources and methodology

The main goal of investments at the agricultural holdings has to be much higher achieved effects per unit of invested financial assets.

The level of achieved effects depends on the quantity and quality of both, realized expenditures and gained incomes. The economic effectiveness of the investment could be calculated as the ratio of obtained effects and realized investment, or as a ratio of realized investment and obtained effects. Accordingly, for the calculation of the investment's economic efficiency it could be used the following formulas (Romanu, Vasilescu, 1993):

$$e = \frac{E}{\varepsilon} \rightarrow \text{maximum} \quad \text{or} \quad e' = \frac{\varepsilon}{E} \rightarrow \text{minimum}$$

Where:

$e$  and  $e'$  - economic effectiveness;

$E$  - gained effects (achieved results);

$\varepsilon$  - realized investments (spent resources).

In the first case, the mathematical formula indicates the economic effect that is achieved per unit of realized investment, which should be *maximized*.

In the second case, by the mathematical formula are shown the investments made per unit of measure of gained economic effects, which should be *minimal*.

Observing the sector of agriculture, *business plan* represents a detailed report (document) containing all elements of certain business idea that should be realized by certain agricultural holding (physical person or legal entity) and which enables to potential investors much faster consideration of presented idea and easier and more efficient decision-making about possible financing or participating in implementation of observed business idea (Čejvanović et al., 2010).

Business idea, what should be achieved in a specific business and how will be provided required resources for the realization of previously set goals, agricultural holding (physical person or legal entity) is presenting by the business plan.

According to concept of sustainable development, business plan at agricultural holdings, besides basic data about investor, market aspects, description of investment idea, projections of incomes and expenditures, also is giving a feasibility of the business idea throughout the static, dynamic and assessment under uncertainty (Subić, 2010).

The business plan should also enable the agricultural holdings to predict their business operations in close future with the possibly lowest risk, as well as to mark their position within the economic environment in which their business activities are done (Kuzman, 2006).

In paper was done the assessment of investment made in purchase of agricultural land and mechanization required in crop production. By the use of Excel software application developed for the creation of business plans in any sector of agricultural production, author's intention was to consolidate methodologies used in developed European countries as to adjust them to domestic agricultural holdings (physical persons and legal entities).

Mentioned software application could significantly facilitate the activities in business planning, as in defining of strategic priorities and making investment decisions at agricultural holdings in the Republic of Serbia. By application launching it could be done detailed insight into the form and content of a business plan. After the opening of Project theme menu, by

the click on the box application for development of business plan in any sector of agricultural production main menu has to be selected and then in the menu for the selection of modules it should be started with data entering (Module 1. to Module 7.). Data importation is done in all fields marked in green, while in other fields previously imported values have converted automatically. After data importation, data could be recorded in the proper folder (Module 7.). Menu for module selection has following appearance:

*Module 1.: General data*

- Title of business plan
- Basic data about investor
- Basic data about investment
- Market aspects

*Module 2.: Investing*

- New fixed assets
- Total investment

*Module 3.: Financing*

- Source of financing
- Financial plan
- Credit calculator

*Module 4.: Assessment of projects effects*

- Assessment of projects effects
- Final remark

*Module 5.: Summary of business plan*

- Summary of business plan

*Module 6.: Verification of business plan*

- Verification of business plan

*Module 7.: Data export*

- Data recording

In paper were used the data collected on the family agricultural holding located at the territory of middle Danube region.

In order to improve production (plant and animal) on the family agricultural holding, as well as to better use the current capacities, holding plans to purchase agricultural land (6 ha) and adequate mechanization for crop production. On the mentioned area, which is the subject of purchase, will be produced corn (2 ha), wheat (2 ha) and sunflower (2 ha).

Planned investment would not lead to any negative impacts on the environment, while engaged labor (members of family agricultural holding, as well as external employees) will comply all safety rules.

## **Research results and discussion**

Considering the research goal, the use of Excel software application for the development of business plan in any sector of agricultural production is primarily focused on the assessment of

investment's economic effectiveness. In the specific case, the assessment implies the investment in agricultural land and mechanization for crop production.

## Module 4: Assessment of the project's effects

### Cash flow

Projection of cash (financial) flow within the planned period implies summing of all values from pro forma invoice linked to the investment, as well as financing construction and income statement, excluding depreciation and interest of taken credit (Subić, 2016).

Table 1: Cash flow

/RSD/

No.	Element	Initial moment	Year					
			I	II	III	IV	V	
<b>I</b>	<b>Total income (1+2+3)</b>	<b>6.798.439,11</b>	<b>1.745.000,00</b>	<b>1.745.000,00</b>	<b>1.745.000,00</b>	<b>1.745.000,00</b>	<b>1.745.000,00</b>	<b>3.235.392,91</b>
1.	Total revenues	0,00	1.745.000,00	1.745.000,00	1.745.000,00	1.745.000,00	1.745.000,00	1.745.000,00
2.	<i>Source of financing</i>	6.798.439,11						
	2.1. Own capital	2.362.745,91						
	2.2. External capital	4.435.693,20						
3.	<i>Remaining project value</i>	0,00	0,00	0,00	0,00	0,00	0,00	1.490.392,91
	3.1. Fixed assets	0,00						872.353,00
	3.2. PWC	0,00						618.039,92
<b>II</b>	<b>Total expenditures (4+5+6+7)</b>	<b>6.798.439,11</b>	<b>388.411,62</b>	<b>1.719.314,42</b>	<b>1.719.314,42</b>	<b>1.719.314,42</b>	<b>1.719.314,42</b>	<b>1.719.314,42</b>
4.	<i>Value of investment</i>	6.798.439,11						
	4.1. In fixed assets	6.180.399,19						
	4.2. In PWC	618.039,92						
5.	Costs without depreciation and interest	0,00	388.411,62	388.411,62	388.411,62	388.411,62	388.411,62	388.411,62
6.	Income tax	0,00	0,00	0,00	0,00	0,00	0,00	0,00
7.	Annuities	0,00	0,00	1.330.902,80	1.330.902,80	1.330.902,80	1.330.902,80	1.330.902,80
<b>III</b>	<b>Net income (I-II)</b>	<b>0,00</b>	<b>1.356.588,38</b>	<b>25.685,58</b>	<b>25.685,58</b>	<b>25.685,58</b>	<b>25.685,58</b>	<b>1.516.078,49</b>

Source: Subić Jonel (2016). Softverska aplikacija za izradu biznis plana u svakoj oblasti poljoprivredne proizvodnje – kupovina poljoprivrednog zemljišta i nabavka mehanizacije za ratarsku proizvodnju. Studija slučaja. Institut za ekonomiku poljoprivrede, Beograd

## Economic flow

Unlike cash flow, in economic flow from income are excluded funding sources and remaining value of the project, as well as liabilities to sources of financing from expenditures (Subić, 2016).

Table 2: Economic flow

/RSD/

No.	Element	Initial moment	Year				
			I	II	III	IV	V
<b>I</b>	<b>Total income (1+2)</b>	<b>0,00</b>	<b>1.745.000,00</b>	<b>1.745.000,00</b>	<b>1.745.000,00</b>	<b>1.745.000,00</b>	<b>3.235.392,91</b>
1.	Total revenues	0,00	1.745.000,00	1.745.000,00	1.745.000,00	1.745.000,00	1.745.000,00
	Remaining project value	0,00	0,00	0,00	0,00	0,00	1.490.392,91
2.	2.1. Fixed assets	0,00					872.353,00
	2.2. PWC	0,00					618.039,92
<b>II</b>	<b>Total expenditures (3+4)</b>	<b>6.798.439,11</b>	<b>388.411,62</b>	<b>388.411,62</b>	<b>388.411,62</b>	<b>388.411,62</b>	<b>388.411,62</b>
	Value of investment	6.798.439,11					
3.	3.1. In fixed assets	6.180.399,19					
	3.2. In PWC	618.039,92					
4.	Costs without depreciation and interest	0,00	388.411,62	388.411,62	388.411,62	388.411,62	388.411,62
5.	Income tax	0,00	0,00	0,00	0,00	0,00	0,00
<b>III</b>	<b>Net income (I-II)</b>	<b>-6.798.439,11</b>	<b>1.356.588,38</b>	<b>1.356.588,38</b>	<b>1.356.588,38</b>	<b>1.356.588,38</b>	<b>2.846.981,29</b>

Source: Subić Jonel (2016). Softverska aplikacija za izradu biznis plana u svakoj oblasti poljoprivredne proizvodnje – kupovina poljoprivrednog zemljišta i nabavka mehanizacije za ratarsku proizvodnju. Studija slučaja. Institut za ekonomiku poljoprivrede, Beograd.

## Static assessment of the project

In this case, the static assessment of the project relates to the calculation that for representative year uses fifth project year (i.e., the year of full capacity).

## Efficiency of production

Production efficiency is usually presented by the coefficient of efficiency of production, which is calculated as the ratio between the overall revenue and overall costs (Subić, Kuzman, 2016).



Table 3: Coefficient of efficiency of production

/RSD/

Year of project	Total revenues – from sales	Total costs	Coefficient of efficiency of production
0	1	2	3 = 1/2
I	1.081.000,00	562.882,22	1,92
II	1.081.000,00	821.157,61	1,32
III	1.081.000,00	755.337,38	1,43
IV	1.081.000,00	685.478,19	1,58
V*	1.081.000,00	611.332,19	1,77

Note: \* Representative year (full capacity)

Source: Subić Jonel (2016). *Softverska aplikacija za izradu biznis plana u svakoj oblasti poljoprivredne proizvodnje – kupovina poljoprivrednog zemljišta i nabavka mehanizacije za ratarsku proizvodnju. Studija slučaja. Institut za ekonomiku poljoprivrede, Beograd.*

The investment is economical (i.e., investment is profitable) if the total income is higher than total costs, in other words if the coefficient is greater than one.

### Accumulation (profitability) of production

Accumulation or profitability of production is usually presented by the rate of accumulation that could be calculated as the ratio between the profit (net effects) and total revenues (Subić, Kuzman, 2016).

Table 4: Rate of accumulation

/RSD/

Years of project	Profit	Total revenues – from sales	Rate of accumulation
0	1	2	3 = (1/2)*100
I	1.182.117,78	1.081.000,00	109,35
II	923.842,39	1.081.000,00	85,46
III	989.662,62	1.081.000,00	91,55
IV	1.059.521,81	1.081.000,00	98,01
V*	1.133.667,81	1.081.000,00	104,87

Note: \* Representative year (full capacity)

Source: Subić Jonel (2016). *Softverska aplikacija za izradu biznis plana u svakoj oblasti poljoprivredne proizvodnje – kupovina poljoprivrednog zemljišta i nabavka mehanizacije za ratarsku proizvodnju. Studija slučaja. Institut za ekonomiku poljoprivrede, Beograd*

The investment project is economically profitable (i.e. accumulative) if the rate of accumulation is higher than the supposed weighted cost of capital (i.e., interest rate). In other words, profitability of production is achieved if during the exploitation of the investment object price of financing sources could be covered and beyond that certain sum of “profit” could be achieved.

## Rentability of investment (estimated value of investment)

Rentability of investment project is usually presented by the rate of rentability that could be calculated as the ratio of profit (net effects) and estimated value of investment (value given by the pro forma invoice). By calculation of rate of rentability is expressed the compounding of investment (Rajnović, Subić, Zakić, 2016).

Table 5: Rate of rentability

/RSD/

Years of project	Profit	Estimated value of investment	Rate of rentability
0	1	2	3=(1/2)*100
I	1.182.117,78	6.798.439,11	17,39
II	923.842,39	6.798.439,11	13,59
III	989.662,62	6.798.439,11	14,56
IV	1.059.521,81	6.798.439,11	15,58
V*	1.133.667,81	6.798.439,11	16,68

Note: \* Representative year (full capacity)

Source: Subić Jonel (2016). *Softverska aplikacija za izradu biznis plana u svakoj oblasti poljoprivredne proizvodnje – kupovina poljoprivrednog zemljišta i nabavka mehanizacije za ratarsku proizvodnju. Studija slučaja. Institut za ekonomiku poljoprivrede, Beograd.*

The investment project is profitable when its rate of rentability is higher than the assumed weighted cost of capital (i.e. interest rate).

## Payback period of investment

Payback period of investment represents the difference between total value of investment and net incomes from the economic flow (the sum of the net incomes has to be higher than the overall value of investment, otherwise the investment will not be disbursed during the lifetime of project). The investment project is profitable if the payback period of investment is shorter than the period of loan repayment (Kuzman, 2006).

Table 6: Payback period of investment

/RSD/

Year of project	Net income from economic flow	Cumulative net incomes
0	-6.798.439,11	-6.798.439,11
I	1.356.588,38	-5.441.850,73
II	1.356.588,38	-4.085.262,35
III	1.356.588,38	-2.728.673,97
IV	1.356.588,38	-1.372.085,59
V	2.846.981,29	1.474.895,71

Source: Subić Jonel (2016). *Softverska aplikacija za izradu biznis plana u svakoj oblasti poljoprivredne proizvodnje – kupovina poljoprivrednog zemljišta i nabavka mehanizacije za ratarsku proizvodnju. Studija slučaja. Institut za ekonomiku poljoprivrede, Beograd.*

It's very important for investor that the period for which the net inflow (i.e. effect) created within the period of investment exploitation will repay the invested assets would be as short as possible (Subić, 2010).

### Dynamic assessment of investment project

Considering the imperfections of static methods, currently throughout the world dynamic methods for assessment of the investment economic efficiency are mostly used (Vasiljević, 2006).

Some authors mark mentioned methods as discount methods or multi-period methods. Discount technique, which is the base of dynamic methods, is a method of bringing down of all incomes and expenditures, derived from investment and formed in different time periods, at their present value, or value of a certain common moment. Discount technique could be defined as a technique that brings down future income and cost flows to their present value (Gittinger, 1972).

The use of dynamic methods is based on the application of financial mathematics, which comes from the assumption that the incomes and expenditures, or net annual incomes (effects) generated in certain years (in different moments of investment establishment and exploitation) could be mutually compared and use for further calculations. Mentioned amounts should be previously made mutually comparable, i.e. bring them to the same accounting moment chosen for their comparison. This could be done by discounting of certain amounts of incomes and expenditures (or net annual incomes) by the use of complex compound interest calculation (Andrić, 1991).

### The net present value and the internal rate of return

The method of net present value (capital value of investment) has the goal to show the justification of planned investment, or whether the investment object by itself is profitable or not. Net present value of investment presents the difference between the sum of the expected incomes realized by investment use and the sum of expenditures made for its implementation and use, brought down to the initial moment of investment exploitation (moment  $n = 0$ ). In other words, the net present value could be considered as present value of the sum of the economic results achieved during the period of investment exploitation (Subić, 2016).

Table 7: The net present value and the internal rate of return

/RSD/

No	Element	Initial moment	Year of project					Initial moment
			I	II	III	IV	V	
0	1	2	3	4	5	6	7	8
1.	Net incomes from economic flow (3 to 7)	-6.798.439,11	1.356.588,38	1.356.588,38	1.356.588,38	1.356.588,38	2.846.981,29	<b>8.273.334,81</b>

2.	Discount rate (%)	4,26	4,26	4,26	4,26	4,26	4,26	
3.	Discount factor $(1+i)^{-n}$ or $1/(1+i)^n$ , where $i$ = discount rate; $n$ = year of project	1,0000	0,9591	0,9199	0,8823	0,8462	0,8116	
4.	Present value of net incomes (3 to 7)	-6.798.439,11	1.301.130,45	1.247.939,67	1.196.923,35	1.147.992,60	2.310.725,51	<b>7.204.711,59</b>
5.	Net present value of project (2 do 7)	<b>406.272,48</b>						
6.	Relative net present value of project $[(2 \text{ do } 7) /  2 ] > i$	<b>0,06</b>						
7.	Internal rate of return (IRR > i)	<b>6,14%</b>						

*Source: Subić Jonel (2016). Softverska aplikacija za izradu biznis plana u svakoj oblasti poljoprivredne proizvodnje – kupovina poljoprivrednog zemljišta i nabavka mehanizacije za ratarsku proizvodnju. Studija slučaja. Institut za ekonomiku poljoprivrede, Beograd.*

In order to consider planned investment profitable, the net present value of the project has to be positive, i.e. above the zero.

In some foreign literature sources, internal rate of return is often defined as “the average ability for profit making of invested capital over the period of investment project” (Gittinger, 1972).

In certain domestic literature sources, internal rate of return is usually defined as the “the level of effective compounding of invested financial assets”, i.e. the level of investment profitability (Andrić, 1991).

The investment could be considered economically profitable if the internal rate of return is higher (or at least equal) than assumed calculative interest rate.

### Payback period of investment

In practice, the method for determining the dynamic payback period of investment is used for risk assessment during the implementation of some investment project (usually as additional method for assessment of economic efficiency of investments (Subić, 2016).

*Table 8: Payback period of investment*

*/RSD/*

Year of project	Present value of net incomes	Cumulative net incomes
0	-6.798.439,11	-6.798.439,11
I	1.301.130,45	-5.497.308,66
II	1.247.939,67	-4.249.368,98
III	1.196.923,35	-3.052.445,63

IV	1.147.992,60	-1.904.453,03
V	2.310.725,51	406.272,48

*Source: Subić Jonel (2016). Softverska aplikacija za izradu biznis plana u svakoj oblasti poljoprivredne proizvodnje – kupovina poljoprivrednog zemljišta i nabavka mehanizacije za ratarsku proizvodnju. Studija slučaja. Institut za ekonomiku poljoprivrede, Beograd.*

Payback period of investment = overall investment - net incomes (where the sum of the net incomes from the economic flow has to be higher than overall investment, otherwise the investment would not be profitable over the period of its use). Therefore, it must be fulfilled the condition that the payback period is shorter than the period of credit repayment.

### Project assessment under uncertainty

In conditions of uncertainty, assessment of project effects could be done by different methods and techniques. However, for the purpose of investment projects assessment at the level of family agricultural holdings, calculation of the break-even point could be considered sufficient.

### Break-even point

Breakeven point additionally is also called as profitability threshold or critical point. Actually, this is a threshold or certain level of production and sales in which investment does not realized neither profit nor loss, or in which is still achieving a positive financial result (Subić, 2016).

Table 9: Break-even point

/RSD/

No	Element	Years of the project				
		I	II	III	IV	V
1	Income (I)	1.081.000,00	1.081.000,00	1.081.000,00	1.081.000,00	1.081.000,00
2	Variable costs (VC)	377.752,00	377.752,00	377.752,00	377.752,00	377.752,00
3	Fixed costs (FC)	10.659,62	10.659,62	10.659,62	10.659,62	10.659,62
4	Marginal result (MR=I-VC)	703.248,00	703.248,00	703.248,00	703.248,00	703.248,00
5	Break-even point (BEP = (FC/MR) x 100), (in %)	1,52	1,52	1,52	1,52	1,52
6	Break-even point by value (BEP <sub>v</sub> = (I x BEP) / 100)	16.385,47	16.385,47	16.385,47	16.385,47	16.385,47
7	Margin of safety (in %) (LS = ((1 - (BEP <sub>v</sub> / I)) x 100)	98,48	98,48	98,48	98,48	98,48

*Source: Subić Jonel (2016). Softverska aplikacija za izradu biznis plana u svakoj oblasti poljoprivredne proizvodnje – kupovina poljoprivrednog zemljišta i nabavka mehanizacije za ratarsku proizvodnju. Studija slučaja. Institut za ekonomiku poljoprivrede, Beograd.*

## Variable and fixed costs

Table 10: Variable costs

/RSD/

No.	Element	Years of the project				
		I	II	III	IV	V
1.	Variable costs (VC = MC + L)	377.752,00	377.752,00	377.752,00	377.752,00	377.752,00
2.	Material costs (MC)	259.000,00	259.000,00	259.000,00	259.000,00	259.000,00
3.	Labour (L)	118.752,00	118.752,00	118.752,00	118.752,00	118.752,00

Source: Subić Jonel (2016). *Softverska aplikacija za izradu biznis plana u svakoj oblasti poljoprivredne proizvodnje – kupovina poljoprivrednog zemljišta i nabavka mehanizacije za ratarsku proizvodnju. Studija slučaja. Institut za ekonomiku poljoprivrede, Beograd.*

Table 11: Fixed costs

/RSD/

No.	Element	Years of the project				
		I	II	III	IV	V
1.	Fixed costs (FC = IMC - L)	10.659,62	10.659,62	10.659,62	10.659,62	10.659,62
2.	Immaterial costs (IMC), without depreciation and interest on credit	129.411,62	129.411,62	129.411,62	129.411,62	129.411,62
3.	Labour (L)	118.752,00	118.752,00	118.752,00	118.752,00	118.752,00

Source: Subić Jonel (2016). *Softverska aplikacija za izradu biznis plana u svakoj oblasti poljoprivredne proizvodnje – kupovina poljoprivrednog zemljišta i nabavka mehanizacije za ratarsku proizvodnju. Studija slučaja. Institut za ekonomiku poljoprivrede, Beograd*

According to methodology, it is necessary to calculate and analyze the critical and the minimal values of production volume and sales revenues below which investment is no longer profitable. Also, it should take all necessary measures that would prevent mentioned situation.

## Conclusion

Summarizing the results obtained during the assessment of the investment project effects (project – “purchase of agricultural land and required mechanization for crop production”) following conclusions could be drawn:

- *Coefficient of efficiency of production* is higher than one, what indicates that the total revenues surpass the total expenditures. Accordingly, it can be concluded that investment project is economical, or that investment is profitable.
- *The rate of accumulation* is higher than 4.26% (assumed weighted cost of capital). Accordingly, it can be concluded that the investment project is accumulative,

meaning that price of financing sources are covered, as well as additional profit is achieved during the project exploitation.

- In line with static calculation, the investment project will be repaid for 4.48 years. So, *payback period* is 4 years and 5.78 months (0.48 x 12 months).
- Five years of investment use (project lifetime) would enable to investor overall increase of profit for 406,272.48 RSD, calculating by discount rate ( $i = 4.26\%$ ) at the initial moment of exploitation ( $n = 0$ ).
- Investment is profitable as the *internal rate of return* is higher than interest rate ( $6.14\% > 6.00\%$ ), or discount rate ( $6.14\% > 4.26\%$ ).
- According to dynamic assessment, investment project will be paid off for 4.82 years. So, *payback period* of investment is 4 years and 9.89 months (0.82 x 12 months).
- In all years of project period, production volume has not fallen below 1.52% (i.e. gained sales revenues have not been below 16,385.47 RSD).
- Also, in each year of project period it's allowed a decrease of production volume for 98.48%.

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## CONSUMERS' ATTITUDE ON LOCALLY MADE TEXTILES AND ITS IMPACT ON JOB CREATION: THE NIGERIAN EXPERIENCE

### Abstract

*This study examined consumers' attitude on Made-in-Nigeria textiles and its impact on Job creation in Osun State, Nigeria. It investigated the reaction of consumers to locally made textiles, examined how attitudes affect patronage of the product and how consumers' attitudes can either make improve or mar destroy the textiles industry. Primary data was used for this study. Consumers of textiles in Osun state constituted the study population, however, Ede town was purposively selected as the study area, due to the locally made textiles market located in the town which enjoyed patronage from within and outside Osun state. One hundred respondents were randomly selected from the sample area. Questionnaire was used to gather information, the data gathered were analysed using both descriptive and inferential statistics. Findings revealed mixed attitudes of consumers toward made-in-Nigeria textiles. It was observed that consumers' attitude played a major role in the patronage of the product as revealed by the chi-square statistic ( $\chi^2 = 30.362$ ,  $p = 0.000$ ). Likewise, findings showed a positive relationship between consumers' attitudes and the growth of textiles industry but statistically insignificant as  $\chi^2 = 14.11$  at  $p = 0.168$ , more also, the result revealed a positive relationship and influence of consumers' attitude on job creation but also not statistically significant as  $\chi^2 = 10.371$  at  $p = 0.409$ . The study concluded that patronage of goods was greatly dependent on the attitude of the consumers and this attitude can influence the economic growth and job creation in the country especially in the textile industry.*

**Key Words:** *Consumers' attitude, local goods, patronage, textiles industry, job creation,*

**Jel Classification:** E24,O10

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## СТАВОВИ ПОТРОШАЧА О ЛОКАЛНИМ ТЕКСТИЛНИМ МАРКАМА И ЊИХОВ УТИЦАЈ НА ОТВАРАЊЕ РАДНИХ МЕСТА: ИСКУСТВО НИГЕРИЈЕ

### Апстракт

Ова студија истражује ставове потрошача о текстилним маркама у Нигерији и њихов утицај на отварање нових радних места у држави Осун у Нигерији. У студији се темељно истражују реакције потрошача на локалне текстилне марке, затим се испитује како ставови потрошача утичу на финансијску подршку производа и како они могу било да побољшају било да униште текстилну индустрију. У студији су коришћени примарни подаци. Потрошачи текстилних марки у држави Осун представљају студијску популацију. Град Еде је одабран као истраживачка област, с обзиром на локалне текстилне марке који су лоциране у граду и које имају финансијску подршку у држави Осун и ван ње. Стотину испитаника је насумице одабрано из узоркованог подручја. Упитник је коришћен за прикупљање података. Прикупљени подаци су анализирани коришћењем дескриптивне и инференцијалне (дедуктивне) статистике. Резултати показују различите ставове потрошача о текстилним маркама у Нигерији. Уочено је да ставови потрошача имају кључну улогу у финансијској подршци производа, како открива хи-квадрат тест ( $\chi^2 = 30,362$ ,  $p = 0,000$ ). Такође, резултати су показали позитиван однос између ставова потрошача и раста текстилне индустрије, али статистички несигнификантан ( $\chi^2 = 14,11$ ,  $p = 0,168$ ), баш као и позитиван однос и утицај ставова потрошача на отварање нових радних места, али не и статистички значајан ( $\chi^2 = 10,371$ ,  $p = 0,409$ ). У закључци студије указује се да финансијска подршка производима у великој мери зависи од ставова потрошача и да ставови потрошача могу утицати на економски раст и отварање нових радних места у земљи, посебно у текстилној индустрији.

**Кључне речи:** ставови потрошача, локални производи, финансијска заштита, текстилна индустрија, отварање радних места

### 1. Introduction

Nigeria is a country blessed with abundance of both human and natural resources that if properly and positively utilized will bring development to the country. It is a nation occupied with different people of diverse culture, beliefs, attitudes, habits and behaviours with under development indices such as unemployment, high rate of poverty level, high rate of violence, lack of access to accurate information. However, Nigerian government over the years had put up some measures to solve most of the challenges with programmes such as; Operation Feed the Nation (OFN) in 1976, Family Economic Advancement Programme (FEAP) in 1997, Family Support Programme (FSP) in 1997, National Poverty Eradication Programme (NAPEP) in 2001, Nigeria Agricultural Development Fund (NADF) in 2002, National Economic Empowerment Development Strategy (NEEDS) in 2003, Commodity Marketing and Development Companies

(CMDC) in 2003 and the introduction of entrepreneurship education in the tertiary institutions in the nation.

However with all the above stated policies, it should be noted that for any developing country seeking to achieve economic growth, such country should endeavour to reduce importation to the barest minimum and utilize locally resources, even if not having the required production capacity for export purposes. In Nigeria for instance, those products that are manufactured locally are referred to as “Made-in-Nigeria goods” (Oladele & Arogundade, 2011). Though, Nigerian consumers has access to several products from around the world, the abundance of foreign brands of many kinds of products in Nigerian markets make it easy for consumers to satisfy their yearnings for these imported items (Asen, Eke & Kalejaye, 2011). These imported goods in particular textiles have jeopardize the economic growth in the country, thereby leading to unemployment and other social vices. Ekerete, (1996) and Okefor, (1996) opined that there has been a wide outcry from economy watchers and analysts about a perceived ugly trend observed on the attitude of indigenous consumers on locally-made Nigeria products. The complaint is that Nigerian consuming public shy away from purchasing made-in-Nigeria goods and prefer foreign-made ones instead. Some commentaries have attributed this trend to the way these consumers perceive the locally made products especially when they compare them with their foreign alternatives. Their perception of locally-made textiles, for instance, as inferior, or of poor quality, improperly designed, and less ‘satisfying’, is said to be the reason for their poor patronage of these products. As a result, indigenous companies and infant industries that produce and market textiles locally easily crumble in the face of competition from those that deal in foreign textiles Moreso, increasing globalization of world trade and Nigerian’s continuous trade liberalization has encouraged dumping of foreign goods in the country thereby making marketing of home-made goods not only difficult, but in some cases almost impossible. Over the last decade, Nigerian manufacturers have been enmeshed in a dilemma, borne out of ensuring long-term survival in an atmosphere of ever increasing product cost, and ever-decreasing consumer purchasing power (Akomoledé & Oladele, 2008).

Industries in Nigeria have long been crying of unfair competition from foreign products that find their way into the country through unauthorized means (Gado & Nmadu, 2011). Many industries have been closed down as they were unable to compete favourably with their counterpart companies in the foreign countries due to the attitude displayed by the Nigerian consumers in patronizing the foreign goods at the expense of the locally-made goods. Due to this, the Nigerian manufacturing sector has witnessed declining capacity utilization resulting in reduced labour force (Obadan, 1998). The textile industry, a major player in manufacturing, appears to be on the fore front of this decline with reports of textile companies closing down on a yearly basis (Obadan, 1998; Jibrin, 2002; Gado & Nmadu, 2011).

Therefore, for Nigeria to develop entrepreneurially, reduce unemployment and create job for the masses, emphasis should be placed on consumers’ attitudes towards the made-in-Nigeria goods in particular textiles.

## 2. Statement of the Problem

So many factors have been identified and attributed to have been the reasons for slow rate in entrepreneurship development in the country. Several scholars have talked about many factors hindering job creation, Arowomole and Oyedokun (2012) identified factors such as lack of variable concept, lack of market familiarity, lack of technical skills, lack of seed capital, lack of business know-how. Other authors such as Obasan (2005) had seen unavailability of required labour, raw material inputs, degree of inflation, lack of technological development, political climate, market and capital, poor-infrastructural facilities, lack of access to accurate information, religion and cultural unrest.

Aremu (2005) in Gadoand Nmadu (2011) opines that massive importation coupled with high cost of production resulted in the closing down of 65 local textile mills, rendering about 150,000 workers jobless is one of the factors that have affected the textiles industry in Nigeria. He almost concluded that the sector had collapsed with unpalatable implications to the nation by way of unemployment, poverty and social vices. Moreso, Ayodele (1998) in Gado and Nmadu (2011) described the public electricity in Nigeria as “Energy crises” and stated that power supply, particularly electricity and petroleum, are crucial to the operation of the textiles companies. Gadoand Nmadu (2011) stated that Ati (1985) and Ubani (1983) identified some performance limiting factors in the Nigerian business environment amongst which are: problems of raw materials and equipment importation, inter-organizational relations, Governmental and parent – organization regulation and interference, indiscriminate importation and smuggling, and inadequate capital and skilled labour. According to them researches had further shown that poor infrastructures have hampered the progress of textile companies in Nigeria, making companies to provide their own power, a situation (Obadan, 1998) refers to as BOYI meaning “Build Your Own Infrastructure” and that this decline in electricity supply has resulted in the decline on the performance of Textiles Industry.

Eneji, Onyinye, Kennedy and Rong (2012) identified technological gaps in the industry, stating that the modernization of spinning capacity is generally lagging behind technological improvements in the weaving mills; low capacity unitization on the part of labour productivity in spinning operations and inadequate provision for on-the-job training as factors affecting Nigeria Textiles Industry. They further stressed that the dependence of Nigeria textile businessmen on liberal import from China and other countries does not necessarily lead to growth in the Nigeria Textile Industry.

However, the preceding empirical evidences had shown that job creation in the textile industry in Nigeria had been attributed to several factors. These factors include lack of technological development, inflation, underdeveloped market, lack of capital, poor infrastructural facilities and lack of access to accurate information. However, there is no conclusive study on the perspective of consumers’ attitude. The need to examine this attitude perspective is necessitated by its capacity to serve either as incentive or otherwise to job creation in the Nigeria’s textile industry.

### 3. Research Objectives

The broad objective of this study was to investigate consumers' attitude on locally made- textiles and its impacts on job creation in Osun State, Nigeria.

The specific objectives were to:

- i. examine the perception of consumers to locally made textiles;
- ii. examine how attitude affects patronage of locally made products;
- iii. determine how consumers' attitude influences the growth of textiles industry;
- iv. examine how consumers' attitude towards locally made textiles affects job creation in the textiles industry.

### 4. Literature Review

Consumers are individuals with likes and dislikes. When the preponderance of people in a particular group feel one way or another about a product, service, entity, person, place or thing, it is said to be a generalized consumer attitude that could affect the marketing of that person, product or entity in positive or negative ways.

Consumers' attitude is consumers' overall, enduring evaluation of a concept or object, such as a person, a brand, a service. An attitude is not fleeting; it is an orientation that lasts over time. An attitude is general in that it summarizes consumers' evaluations over a wide range of situation. Attitudes are important because they reflect what consumers think and feel. They also can be used to explain what the consumers intend to do. The thinking portion of the attitude is called a *cognition* while the feeling or hedonic portion relates to emotion.

#### 4.1 Components of Consumers' Attitude

Consumer attitudes are a composite of a consumer's (1) beliefs about, (2) feeling about, and (3) behavioural intentions toward some object-within the context of marketing, usually a brand or retail store. These components are viewed together since they are highly interdependent and together represent forces that influence how the consumer will react to the object.

**Beliefs:** The first component is belief. A consumer may hold both positive beliefs toward an object as well as negative beliefs. In addition, some beliefs may be neutral and some may be differing in valance depending on the person or the situation. The beliefs that consumers hold need not be accurate, and some belief may, upon closer examination, be contradictory.

**Feelings / Affect:** Consumers also hold certain feelings toward brands or other objects. Sometimes these feelings are based on the beliefs, but there may also be feelings which are relatively independent of beliefs.

**Behavioural Intention:** The behavioural intention is what the consumer plans to do with respect to the object (e.g., buy or not buy the brand). As with affect, this is sometimes a logical consequence of beliefs (or affect), but may sometimes reflect other circumstances (Wikipedia, 14<sup>th</sup> Dec., 2012).

## 4.2 The Status of Textile Industry in Nigeria

Nigeria is the largest country in black Africa with a population forecast of 150 million people broken into 36 states with Abuja as the Federal Capital. With this population and clothing being a basic need of life, it is evidently clear that Nigeria constitutes a very large market for textile materials (Njoku, 2004).

The textile industry of Nigeria is said to be the third largest in Africa after Egypt and South Africa. The industry is mainly controlled by large private-sector and it is the largest employer of labour in the manufacturing sector, it accounts for about 25 percent of total manufacturing employment (Wikipedia, 14<sup>th</sup> Dec., 2012).

The Gross National Product or Gross Domestic Product of Nigeria and the per capita income can question sustain a vibrant textile industry to satisfy the domestic market and export if possible, ironically this is not the case.

According to Njoku (2004), he states that in 1990, there were 175 textiles factories operating in Nigeria but as of today it has reduced to 42 epileptic operators and it is only 12 of these that can boast of operating at 30% capacity. He further stated that the investment and savings policies of 1960s induced steady growth which gave rise to an average of 12.5% growth rate in the 1970s. The recession of the early to mid (1980) dealt with the industry and took its toll. The cumulative Textile Production indeed (1972 – 2000) declined from 4271 to 171.1 in 1984 and 112.8 in 2003. The industry recovered in the late 1980s achieving an annual growth rate of about 67% between 1985 and 1991.

The industry was the largest employer of labour in the manufacturing sector within these periods. Capacity utilization integration programme embarked upon by many firms in the industry in compliance with the government policy issued in the mid-1980s was positive contributing factor. Thus, the level of domestic sourcing of raw materials witnessed a steady improvement from 52% in 1987, 57% in 1988 to 64% in 1991. However, this improved performance was not universal among the firms in the industry. The few producers of lace textiles who were producing less than 20% of the total textiles output in 1980 dropped to 12% in 1994 and less than 8% in 2003. This decline could be traced to the quality and quantity of the type of cotton used. For other types of textiles production, the level of local raw materials usage increased because they could be obtained locally while that of the lace material can only be imported (Wikipedia, 14<sup>th</sup> Dec., 2012).

The Nigeria Textile Industry represents, a strategy non-oil industry for Nigeria, though under developed but a potential investment and industrialization in sub-Sahara / African, size and population; the third largest textile industry in Africa after Egypt and South-Africa; the world largest but singular consumer of lace products of annual demand of about 32.8% of the global output; on replacement basis, the present installed textile manufacturing capacity in Nigeria represents £3 billion investment. Although operating at about 25% capacity in 2003, the current production is approximately \$281.25 million. (Wikipedia, 14<sup>th</sup> Dec. 2012).

In the year 2000, Nigeria Textile Industry produced about 500 million metres of all types of fabrics. In 2002 they produced 72% of the West Africa production with the embroidered lace contributing only 12% (World Trade Organization Annual Bulletin, 2003) in Njoku (2004). He further stressed that, despite the fact that Nigeria has favourable trade agreements, its export declined whilst its imports increased dramatically leading



to a situation that the Nigeria Textile Industry has a market share of about 34% in the home market.

### 4.3 Factors Contributing to Nigeria’s Crisis Ridden Clothing and Textile Industry

Wikipedia (December 2012) posted out some factors which were seen to have contributed to the decline of textiles industry in Nigeria:

**Trade Policies:** Prior to the mid – 50s, Nigeria had a successful agricultural industry, exporting cash crops like cotton, cocoa and groundnut. The success of the agricultural industry paralleled with that of textiles. Textiles and agriculture went hand in hand as agriculture provided the raw material i.e. cotton in the first step of the textile supply chain. By the mid – 50s, however, the agricultural boom came to an end. Post 1960, attaining its independence and embracing nationalism, Nigeria adopted an import substitution strategy. This translated to control on cotton prices and high tariffs, among many tactics used, on imported textiles. From 1967 – 70 (the Biafra War) and later 1977, there was an outright ban on imported textiles. These bans were meant to provide leverage for Nigeria in its dealings with its trading partners. In fact, the 1977 ban, for example, was the result of what the government deemed a self-sufficient clothing and textile industry. The government, arguably, got it right.

As of 1980, Nigeria was ranked the third largest textile industry in Africa after Egypt and South Africa. However, amidst the oil boom of the 70s to 80s, Nigeria became over reliant on oil, to the detriment of its agricultural sector. Cotton production, for example, was in the 1980s, fifty percent below its production capacity. There was nothing in place to actively stop its rapid decline. Nigeria engaged in a culture of high consumption but produced less. By 1974, Nigeria was importing simple basics like food. By 1985 things got worse and a year later, Structural Adjustment Program (SAP) was introduced. SAP ran from 1986 to 1988 and was defined as a period of massive devaluation of the Naira.

**Raw Materials:** from 1903 to 1974, the British Cotton Growers Association was in place to help regulate and advocate for Cotton Growers. By 1974, it was replaced with the Nigerian Cotton Marketing Board who retained the same functionalities including added functions of marketing its cotton. By 1986, however, the year SAP was implemented, the board was abolished. What would follow, especially with no oversight, was a further deterioration within the cotton industry in terms of production capacity. This meant the textile industry had insufficient and at times no raw materials to work with. As a result, fabric manufacturers relied heavily on imported raw materials and other textile inputs to even begin fabric production.

**Outdated Equipment:** The massive devaluation of the Naira, however, made it impossible for manufacturers to even afford imported textile and textile inputs. Further, even fabric designers that could afford raw materials had to contend with outdated and run down equipment. The use of outdated equipment was, needless to say, crippling as it forced fabric designers to operate well below capacity. For instance, in 1986, the industry was performing at 37% below capacity utilization. By 1998, it had diminished to 28%.

**Infrastructural Issues and Unemployment:** Exacerbating the problems above were infrastructural issues, particularly power supply. The constant power failure, also caused by a Nigeria Electric Power Authority (NEPA) now Power Holding Company

of Nigeria (PHCN) operating well below its 6,000 MW capacity, made it extremely difficult for textile businesses to see a return on investments much less break even. The corresponding result was heavy retrenchments, huge turnover rates with the adverse effect of erosion of skilled workers, factory closures, riots and chaos.

Further, although Nigeria, especially during the import substitution era of the 70s had tried to make most of its textile plants Nigerian owned, the fact remained that foreigners had the major market share. In 1986, for instance, according to extensive research conducted by Swedish researchers on the union power in Nigeria's textile industry, Nigeria's Textile Manufacturer Association reported 75 members. Of these 75, 30 were Indian owned firms with the rest being Chinese and Lebanese. Only 4 of the 75 were reported as indigenous Nigerian owned firms. Amidst all the instability, huge operational cost, riots and corruption, these foreigners returned to their countries of origin. Sometimes, they left just as quickly as they had appeared leaving no retrenchment benefits.

**Corruption:** Adding fuel to the already burning fire of the textile industry was the government's corruption practices. Despite the billions made from oil revenues, the Nigerian government had nothing to show. Oil monies had been used to sustain Nigeria's addiction on imported products, engage in excesses and embezzlements. For instance, in the 80s, the government built a \$2.4 billion smelter. The cost was 60 – 100% higher than what it would have cost to build the smelter in a developed country.

**“Bend Down Select” and Chinese Imports:** The above factors along with trade liberalization policies adopted in the 90s, opened the floodgates for Second Hand Clothing a.k.a. “bend down select” from the West and later Chinese goods. Specific to the “bend down select” market, affordability reigned supreme as Nigeria could no longer afford to cloth its own citizens. Specific to Chinese imports, neither Nigeria nor the world anticipated the threat China would pose for textile companies in the West and developing countries.

Prior to 1974, the USA along with other European countries made up members of GATT, had signed trade agreements that restricted trade in cotton production with its exporting countries. Further restrictions came in 1974 with the establishment of the Multi Fiber Arrangement (MFA), a system of quotas which restricted all importation of textile goods from developing countries, with the exception of silk. MFA was set to expire in December of 2004. What appeared unanticipated was that China would join the World Trade Organization (WTO). China joined the WTO in 2001 and by 2003, it had 17% of the world's textile market share. Meanwhile, in 1995, the WTO enacted the Agreement on Textiles and Clothing (ATC). The purpose of the ATC, a multilateral instrument, was to eliminate textile quotas for all WTO members by January 1<sup>st</sup>, 2005. 2006, China was the largest producer of apparel / textile products in the world.

With China's strong emergence on the apparel / textiles world map, it flooded other countries' domestic markets, across the globe, with its cheap imports. Meanwhile, African countries like Nigeria who finally saw restrictions on trade lifted and were waiting to take a big bite out of the Western apple, where now having to contend with China.

Nigeria matched against China was simply not a threat. For Nigeria's textile industry, the lack of diversity and innovation in textile designs plus the aforementioned factors, made it extremely vulnerable. Chinese textile mills outpaced Nigeria in

production capacity, labour / skilled workers, regulatory compliance in exporting to Western countries and innovative equipment. Worse, the Chinese did not spare Nigeria in its domestic market. The Chinese mastered and produced Nigeria designs like “ankara” and “asooke”, stamped “made in Nigeria” on them and sold them in Nigeria as local products.

The affordability saw consumers shunning the more expensive and genuine Nigeria textiles for China’s cheap import, Nigeria’s already stressed out textile industry saw even more factory closures, retrenchments, and lesser production capacity.

While the government attempted to put a bandage on the wound inflicted by the Chinese, the mind set of Nigerians and corruption practices made it very hard to enforce. As such, there has been ongoing and overwhelming smuggling of Chinese goods into the country undermining government efforts (Wikipedia, 14<sup>th</sup> Dec. 2012).

#### **4.4 The Need for Job Creation**

According to the Nigerian Bureau of Statistics (NBS), the country’s unemployment rate has increased to 9.9 percent in the third quarter of 2015, representing a fourth consecutive rise in the unemployment rate since the third quarter of 2014. The Bureau revealed that a total of 1,454,620 Nigerians are unemployed in this quarter compared to 529,923 in the second quarter and this has led to an increase from 8.2 percent in second quarter 2015 to 9.9 percent in third quarter 2015. Therefore, there is an urgent need to create jobs so as to accommodate the unemployed and to reduce the level of unemployment to the barest minimal.

### **5. Methodology**

Descriptive research design was adopted so as to unravel the essential elements and characteristics of the concepts under investigation and also to analyse the relationships that exist between the variables of interest.

The study covered OsunState; the state is one of the states under southwestern zone in Nigeria. The state is made up of thirty local governments. However, Ede-North local government was purposively selected for the study, this was due to the relevance of the town to the study at hand. Ede is majorly known as an area that is specialized in local textiles making in the state, and also because of the local textiles market situated in the town that enjoys the patronage of people both locally and internationally.

The study employed primary source of data, 100 respondents were randomly selected for the study. A structured questionnaire was administered on the qualified respondents of the study. However, from the 100 respondents whom the questionnaire was administered on, only 94 respondents returned the answered questionnaire.

The research objectives for this study were achieved with the use of descriptive and inferential statistics. Descriptive statistics like percentages, tabulation, graphs, and frequency distribution were used to analyse the data. Inferential statistics techniques were used in testing the relationship between the dependent and the independent variables, while chi-square analysis technique was adopted to measure the effect of the independent

variable (consumers' attitudes on made-in-Nigeria textiles) on the dependent variable (job creation).

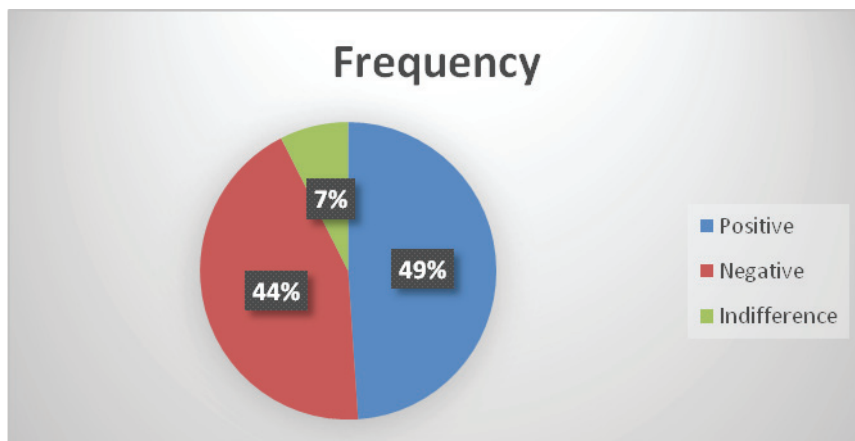
## 6. Findings and Discussion

Consumers expressed their diverse perception on the locally made products as shown in Table 1. The table depicted that respondents with negative attitude towards made-in-Nigeria textiles were approximately 44%, while 49% respondents were positive and 7% respondents were indifferent. This reveals mixed attitudes towards made-in-Nigeria textiles. However, larger percentage are of positive attitude towards made-in-Nigeria textiles.

Table 1: Consumers' Attitudes Towards Made-in-Nigeria Textiles

Variables		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	POSITIVE	46	48.9	48.9	48.9
	NEGATIVE	41	43.6	43.6	92.6
	INDIFFERENCE	7	7.4	7.4	100.0
	Total	94	100.0	100.0	

Source: Survey, 2016



Source: Survey, 2016

Table 2 revealed that 29.8% respondents strongly disagreed that patronage is not being determined by consumers' attitude, 27.7% disagreed, while 17% and 10.6% agreed and strongly agreed respectively. Therefore, from the analysis by the level of agreement of respondents, it can easily be inferred that patronage of product is determined by consumers' attitude on that product.

Table 2: Patronage is not Determined by Consumer's Attitude on the Product

	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid NO RESPONSE	4	4.3	4.3	4.3
STRONGLY DISAGREE	28	29.8	29.8	34.0
DISAGREE	26	27.7	27.7	61.7
NEUTRAL	10	10.6	10.6	72.3
AGREE	16	17.0	17.0	89.4
STRONGLY AGREE	10	10.6	10.6	100.0
Total	94	100.0	100.0	

Source: Survey, 2016

The chi square statistic as shown in table 3 revealed that patronage depends on consumers' attitude since the  $\chi^2 = 30.362$  and P-value 0.000. Therefore, with the P-value being less than 0.05 significance level, this indicates that consumers' attitude is statistically significant to patronage.

Table 3: Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	30.362 <sup>a</sup>	6	.000
Likelihood Ratio	36.191	6	.000
Linear-by-Linear Association	4.735	1	.030
N of Valid Cases	94		

Table 4 below revealed that 33% respondents strongly agreed and 42.6% agreed that consumers' attitude on made in Nigeria textiles could either mar or make the industry while 3.2% strongly disagreed, 8.5% disagreed, 8.5% neutral and 4.3% gave no response. Therefore, with the level of respondents' agreement to the statement, it can be deduced that consumers' attitude has impact on the textiles industry,

*Table 4: Consumers' Attitude on Made in Nigeria Textiles Could Either Mar or Make the Industry*

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	NO RESPONSE	4	4.3	4.3	4.3
	STRONGLY DISAGREE	3	3.2	3.2	7.4
	DISAGREE	8	8.5	8.5	16.0
	NEUTRAL	8	8.5	8.5	24.5
	AGREE	40	42.6	42.6	67.0
	STRONGLY AGREE	31	33.0	33.0	100.0
	Total	94	100.0	100.0	

*Source: Survey, 2016*

The chi-square statistic as shown in table 5 revealed  $\chi^2$  value of 14.110 and p-value of .168, this implies that though there is positive relationship between consumers' attitude and the growth of the textiles industry but consumers' attitude to the industry growth is statistically insignificant as p-value is greater than 0.05 level of significance.

*Table 5: Chi-Square Tests*

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14.110 <sup>a</sup>	10	.168
Likelihood Ratio	17.117	10	.072
Linear-by-Linear Association	1.767	1	.184
N of Valid Cases	94		

Table 6 depicts that consumers' attitude can influence job creation, as 54.3% respondents strongly agreed, 28.7% agreed while 10.6% were neutral, 4.3% gave no response, 1.1% and 1.1% were strongly disagreed and disagreed respectively. Therefore, the result revealed the importance of consumers' attitude on job creation in the textile industry, as larger percentage agreed that consumers' attitude can influence job creation.

*Table 6: Continued and Increased Production with Profitability will Provide Bases for Job Creation*

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	NO RESPONSE	4	4.3	4.3	4.3
	STRONGLY DISAGREE	1	1.1	1.1	5.3
	DISAGREE	1	1.1	1.1	6.4
	NEUTRAL	10	10.6	10.6	17.0
	AGREE	27	28.7	28.7	45.7
	STRONGLY AGREE	51	54.3	54.3	100.0
	Total	94	100.0	100.0	

*Source: Survey, 2016*

More so, the chi-square statistic shown in table 7 revealed  $\chi^2$  value of 10.371 and p-value of .409, this implies that although there is positive relationship between consumers' attitude and job creation in the textiles industry, consumers' attitude is not statistically significant to job creation as p-value is greater than 0.05 level of significance.

*Table 7: Chi-Square Tests*

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.371 <sup>a</sup>	10	.409
Likelihood Ratio	13.432	10	.201
Linear-by-Linear Association	2.411	1	.121
N of Valid Cases	94		

*Source: Survey 2016*

## 7. Recommendations for future researches

The facts obtained from the findings and conclusion of this study provides sufficient ground to recommend that policies that will encourage positive attitude and high patronage of the locally produced goods in particular textiles should be enforced by the government. Also, the government should not be biased in concentrating attention to only one sector of the economy, oil business alone can not foster the needed growth in the nation. Other industrial sector should be given appropriate attention as this will also provide adequate employment. The government should pay serious attention to border effects as they affect the flow and availability of goods traded internationally and domestically as confirmed by Evans (2003) in Njoku (2004) as this will help in checkmating the rate of textile dumping in the country.

In order to increase the quality of the product, the Standard Organiation of Nigeria and all other agencies overseeing the standard of products in Nigeria need to be awaken to perform their duties effectively and judiciously.

Also, to the manufacturers of the textiles in Nigeria, product quality should be a major concern, as this will increase patronage and profitability.

Nigeria consumers should be aware of the fact that favourable attitude towards foreign textiles at the expense of locally made ones will have negative implications on per capita domestic productivity. They should be made to know that consuming foreign textiles at the expense of made in Nigeria textiles will generate income for the foreign country at the expense of the domestic country, thereby developing the foreign country instead of own country. Hence, there is a need for consumers to disabuse their mind from the subconscious enslavement inherent in the consumption of foreign products, textiles in particular and embrace our own products so as to create jobs and develop the industries in the country.



## 7. Conclusion

Findings revealed that consumers are of mixed attitudes towards made in Nigeria textiles, some have a positive attitude, some negative while others are indifferent. Result also shows that patronage of made-in-Nigeria textiles is influenced by the attitude of consumers, this implies that consumers' attitude towards the locally made textiles has a great extent to determine if the product will enjoy patronage of consumers or not. Also, it was unveiled that larger percentage of consumers are of the opinion that attitude towards textiles made in Nigeria can either make or mar the industry, respondents are of the view that if consumers' attitude are favourably disposed to made-in-Nigeria textiles and backed up by good patronage of the product, this will help the textiles industry. Likewise, respondents are of the view that consumers' attitude can affect job creation in the state, though not statistically significant, it was believed that if the industry is doing well through increased productivity and profitability made possible by the patronage enjoyed from Nigerian consumers, this will aid job creation thereby reducing the level of unemployment in the state and in Nigeria as a whole.

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## MEASURING INTELLECTUAL CAPITAL OF NATIONAL ECONOMIES<sup>3</sup>

### Abstract

*The importance of intellectual capital for creating and sustaining competitive advantage of firms has been well established and confirmed in theory and practice. Intellectual resources proved to be the most valuable resources in the process of value creation for various stakeholders. Starting from 1980s onwards, both researchers and practitioners have focused on finding the best solution for measuring intellectual capital in order to enable efficient management and reporting on intellectual capital. Soon after that, their attention switched from an organisational level to the level of cities, regions and national economies. The intellectual capital of a nation has become the most important driver of national wealth. Therefore, the aim of the paper is to examine the concept of national intellectual capital, as well as various measurement methodologies available for valuing the intangible resources of nations. Critical assessment of presented methodologies will give an overview to the policy makers how to identify and value the national intellectual capital in order to increase their national wealth and improve the well-being of their citizens.*

**Key words:** national intellectual capital, knowledge economy, measurement methodologies, national wealth

**JEL classification:** O11, O34

## МЕРЕЊЕ ИНТЕЛЕКТУАЛНОГ КАПИТАЛА НАЦИОНАЛНИХ ЕКОНОМИЈА

### Апстракт

*Значај интелектуалног капитала за стварање и одржавање конкурентске предности предузећа је добро утврђен и потврђен у теорији и пракси. Интелектуални ресурси су се показали као највреднији ресурси у процесу стварања вредности за различите стејхолдере. Почев од 1980-их и истраживачи и практичари су се фокусирали на проналажење најбољег решења за мерење интелектуалног капитала како би омогућили ефикасно управљање и извештавање о*

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*интелектуалном капиталу. Убрзо затим, њихова пажња се са организационог нивоа померила на градове, регионе и националне привреде. Национални интелектуални капитал је постао најзначајнији покретач националног богатства. У том смислу, циљ овог рада је да истражи концепт националног интелектуалног капитала, као и различите расположиве методологије за мерење нематеријалних ресурса на нивоу националних привреда. Критичка оцена презентованих методологија ће дати увид креаторима политика како да идентификују и вреднују национални интелектуални капитал у циљу повећања њиховог националног богатства и побољшања добробити њихових грађана.*

**Кључне речи:** национални интелектуални капитал, економија знања, методологије мерења, национално богатство

## Introduction

Numerous technological advances and globalization have altered the sources of value creation and growth. In the new era – the knowledge era – the emphasis has been put on the knowledge resources as the primary production factors which have replaced the traditional production factors, such as a land, labour and capital. Only a few decades ago in 1978, the 80% of the value of corporations was attributed to the tangible assets, while 20% was ascribed to intangible assets (Sullivan & Sullivan, 2000, p. 328). In contemporary circumstances, this proportion has changed in favour of intangible assets, and now the intangible, intellectual resources have the dominance over tangible assets – 87%:13% (Ocean Tomo, 2015).

The importance of intellectual resources in the process of value creation has been well recognised by the knowledge intensive firms starting from 1980s onwards. The market value of these firms was far above their book value, and this difference was attributed to the intellectual capital. As the main components of the intellectual capital at the micro level, the human, structural and relational capital, were identified. Once, the intellectual resources proved to be important and valuable for the competitiveness of firms, academic researchers and practitioners have been interested in the role they have in the process of wealth creation and competitiveness of cities, regions and nations. Since then numerous studies have been conducted focusing on valuing national intellectual capital by replicating microeconomic models for measuring intellectual capital (Lazuka, 2012, p. 8).

But in order to efficiently manage intellectual capital of nations, improve the competitive position of a country in the international market, and hence improve the living conditions of their citizens, it is necessary to better understand the concept of intellectual capital of nations, its categorization, and measuring approaches. Bearing all this in mind, the aim of this paper is to give the comprehensive analysis of the concept of intellectual capital at the national economy level, theoretical examination of its relationship and contribution to the economic growth from the growth theories, and critical analysis of different methodologies available for measurement these intangible resources.

The paper is structured as follows. The introduction gives the brief overview of the subject of the paper and describes the authors' motivation for choosing this topic. The first section is devoted to the macroeconomic foundations of intellectual capital. Afterwards, the

role of intellectual capital in economic growth literature will be studied. The subsequent section will critically address several methodologies for the measurement of the intellectual capital of nations. Finally, the conclusion will sum up the main findings.

## **The Macroeconomic Foundations of Intellectual Capital**

The rapid development of information and communication technologies brings substantial benefits which are used for intensifying the dynamics of economic development of countries and regions, thus leading to the effective transformation of knowledge, skills, talents and know-how of individuals in profit and non-profit organisations and enterprises. Contemporary business conditions require workers with diverse intellectual agility and competences needed for the critical thinking in the technologically intensive environment (Krstić & Vukadinović, 2009). Besides, these knowledge workers are necessary for creating potentials and new resources in order to increase the wealth of nations.

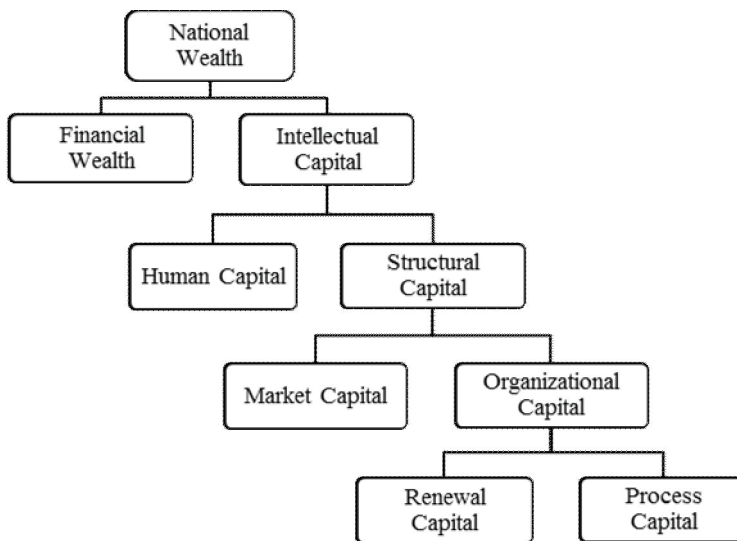
Therefore, the competitive advantage of nations and their wealth is no longer based on comparative advantages they have, but on competitive advantages they create (Rakić & Rađenović, 2016). Constant technological changes and processes of globalization and liberalization have directed the transformation of industrial economies into knowledge economies by shifting the focus of natural resources to the knowledge and innovation (Laroche et al., 1999, p. 88). In this new economy, knowledge, innovations and networking have become the basic drivers of a country's economic prosperity, and hence the wealth of nations depends on the level of knowledge and its effective and efficient usage (Krstić & Vukadinović, 2009, p. 460).

Although the notion of intellectual capital is mostly associated with the microeconomic and management literature, its roots can be easily found in the macroeconomic and growth literature as well. Originally, the term intellectual capital was ascribed to Machlup (1962), who coined it in order to explain the importance of knowledge for the growth and development of firms and nations. It has been well recognised that knowledge, i.e. intellectual capital occupies the central place in the process of economic growth and development in the knowledge economy (Krstić & Stanišić, 2013, p. 153).

The concept of intellectual capital of a country involves the combination of various variables which can be helpful for identification, encompassing and management of its invisible intangible wealth. This concept has to provide the basis for measuring and monitoring of national (regional) intellectual resources, determine their impact on the previous development and necessary steps of macroeconomic management in guiding economic prosperity (Krstić & Vukadinović, 2009). Malhotra (2000) highlights that policy makers of national economies development policies are trying to find consistent and reliable methodology to measure knowledge assets in order to comprehend their relations with the future performance.

The concept of national intellectual capital involves the implicit value of individuals, firms, institutions, communities and regions that are the current and potential sources of wealth creation (Edvinsson & Stenfelt, 1999; Bontis, 2004). The intellectual capital of a country represents its capability to transform knowledge and other intangible assets into wealth (Bradley,

1997a; 1997b). The intellectual capital of a nation or society reflects the intellectual capital of its individuals and organizations (Edvinsson, 2002). The wealth of a nation or a country can be viewed as the combination of the financial wealth of a country represented in gross domestic product per capita and national intellectual capital (Figure 1). The notion of national intellectual capital is based on the elements of the microeconomic concept of intellectual capital, that is, human capital and structural capital. Numerous studies have replicated measurements from micro level to the level of nations (Edvinsson & Stenfelt, 1999; Malhotra, 2003; Bontis, 2004; Andriessen & Stam, 2004; Hervas-Oliver & Dalmau-Porta, 2007; Weziak, 2007; Stähle & Bounfour, 2008; Lin & Edvinsson, 2008; 2011; Stam & Andriessen, 2009; Lazuka, 2012). Moving from the level of a firm to the level of a nation is based on a premise that intellectual capital is an important driver of productivity and competitiveness of a country as it is for a firm (Labra & Sánchez, 2013). The intellectual capital of nations is a concept that applies the principles of intellectual capital measurement and management on a macroeconomic level in order to direct the future perspectives of economic developments (Andriessen & Stam, 2004, p. 11). However, the complexity of intellectual capital valuation makes it impossible to simply translate micro models to the national level (Lin & Edvinsson, 2011), since the assessment of hidden value for countries is more difficult than for firms (Käpylä et al., 2012).



**Figure 1. The Intellectual Capital of Nations**

*Source: Bontis (2005, p. 115)*

According to Bontis (2004) the national intellectual capital is comprised of four components: human capital (“knowledge, education and competencies of individuals in realizing national tasks and goals” (p. 20)), market capital (“intellectual capital embedded in national intra-relationships” (p. 23)), renewal capital (“nation’s future intellectual wealth” (p. 24)) and process capital (“non-human storehouses of knowledge in a nation which are embedded in its technological, information and communications systems” (p. 21)). But, there is not a unique classification of intellectual capital components among researchers and “the content of intellectual capital and its different components (i.e. human/relational/market/

structural/process/renewal) remains quite vague” (Käpylä et al., 2012, p. 346). Different studies employ different classifications and this puts considerable obstacle for international comparisons. Namely, the basic enticement for measuring the intellectual wealth of nations is to gain insight into the relative advantage of countries, thus enabling the development of policies directed toward improving future economic performance (Andriessen & Stam, 2004, p. 11). This is possible by comprehending the relationships and synergies that can increase the value of each sub-component of intellectual capital (Choo & Bontis, 2002).

Before assessing different measurement methodologies, the role of the intellectual capital in the process of wealth creation will be explained through the growth literature.

## Intellectual Capital in the Growth Literature

According to neoclassical economic theory, knowledge as the central part of intellectual capital has always been the contributing factor of economic relationships whose value has been expressed through the price of labour (Vlada RS, 2011, pp. 2-3). Due to the law of diminishing returns, the theoretical explanation of economic growth was based on the extensive usage of natural resources and labour, on one hand, and changes in technology and organization of production, on the other hand, where these changes were observed as an exogenous factor of economic development (Vlada RS, 2011, p. 3). Namely, the costs and benefits of the development and application of new technologies were not incorporated in the growth model, since it was believed that they are the result of non-economic factors.

Therefore, the Solow’s (1957) growth model was unable to explain the major determinants of productivity growth (Viedma Marti & Cabrita, 2012, p. 18), as the huge amount of growth was attributed to the Solow’s residual, i.e. the part of output growth that cannot be accounted for by growth in the primary production factors (labour and capital), but by other exogenous factor that have influence on growth. This residual factor accounted for 85% of the output growth that could not be explained by changes in the growth of physical inputs (Wilson & Briscoe, 2004, p. 38).

Hence, the basic Solow’s model can be augmented by incorporating different types of labour (for example, different lengths of schooling, qualifications, occupations, etc.) (Wilson & Briscoe, 2004, p. 40), i.e. stock of human capital as an additional explanatory variable in the model, so that production function has the following form (Mankiw et al., 1992, p. 416):

$$Y_t = K_t^\alpha H_t^\beta (A_t L_t)^{1-\alpha-\beta}$$

Where:  $\alpha + \beta < 1$ ,  $Y$  – output,  $K$  – capital,  $L$  – labour,  $A$  – the level of technology,  $H$  – stock of human capital,  $t$  – time.

This form allows to easily establish the relationship with current and past investments in knowledge, since these investments in intellectual capital generate current output, holding tangible inputs constant (Wilson & Briscoe, 2004, p. 40). Thus, the stock of human capital determines the income per capita, whereas differences in saving, education, and population growth explain cross-country differences in income per capita (Mankiw et al., 1992, p. 433).

Based on the critics of the traditional neoclassical growth model, the new theories emerged which observed these other factors as endogenous. These endogenous growth models focus on the importance of knowledge and innovations for the long-term economic growth (Romer, 1986; 1987; 1990; 1994; Lucas, 1988; Pelinescu, 2015). Rapid changes in



economic and everyday life, as the consequence of the increase of scientific and professional knowledge, have led to the augmentation and revision of the economic growth model to incorporate technological changes. The important proposition of the new growth model is the fact that technology, i.e. knowledge, i.e. intellectual capital is not subject to the law of diminishing returns (Vlada RS, 2011, p. 3).

Opposite to the neoclassical growth model which implies the convergence in the gross domestic product per capita, that is, the convergence of the countries at different level of economic development, the endogenous growth models arose as the result of divergence in the gross domestic product per capita of different countries, and rejecting the premise of diminishing returns (Cvetanović & Novaković, 2014, p. 111). Namely, the theorists of the endogenous growth consider the state of imperfect competition as real, and thus economies do not need to unconditionally achieve the stable rate of equilibrium growth, whereas the growth at rates higher than equilibrium is sustainable due to the increasing returns (Cvetanović & Despotović, 2014, p. 13). According to Romer (1986), “the long-run growth is driven primarily by the accumulation of knowledge by forward-looking, profit-maximizing agents” (p. 1003).

Endogenous growth models can be divided into three broad groups (Mervar, 1999; 2003; Cvetanović & Despotović, 2014; Cvetanović & Novaković, 2014):

- Models based on the externalities, in which the departure from the assumption of diminishing returns is linked to the effects of learning by doing (Arrow, 1962), spillovers of knowledge (Romer, 1986), and human capital accumulation, either through schooling or learning-by-doing (Lucas, 1988);
- Models based on the research and development activities, in which building upon the Schumpeter’s ideas (1942) the drivers of economic growth are the results of research and development activities. Romer’s dynamic model (1990) is characterised by the monopolistic competition and existence of research sector that uses human capital and existing stock of knowledge to produce new knowledge. Hence, the basic implication of this model is that an economy with a larger stock of human capital will achieve faster growth (Romer, 1990, p. S99).
- *AK* growth models, in which the economic growth is a result of capital accumulation, where capital can have different forms, including human and physical capital (Rebelo, 1991). In these models *A* does not represent the level of technology, but constant that indicates the linear relationship between produced output and capital (Mervar, 2003, p. 383), where the marginal product of capital has to be above specific lower bound in order individuals to endlessly accumulate capital and investments never to exhibit the diminishing returns (Cvetanović & Novaković, 2014, p. 117).

The important implication of the endogenous growth models is that economies with a larger extent of savings and investments grow faster in the long run, and hence, policies that have influence of the rate of savings are more important for economic prosperity, since they can contribute to the continuous increase of growth (Mervar, 1999, p. 12). Additionally, governments orientated toward supporting the economic growth and development, have to design macroeconomic policies that stimulate investments in the research and development of new ideas, as well as to subsidize the accumulation of total human capital (Romer, 1990, p. S99). The intellectual capital theory is rooted in these endogenous growth models, where

the value of enterprises and wealth of cities, regions and nations is generated from human, structural and relational capital (Kolaković, 2003, p. 925).

## Measurement Methodologies at Macro Level

During the last two decades, research and studies on national intellectual capital have shaped several measurement tools to capture the impact of intellectual capital on the economic performance of a country. Developed methodologies seems to differ mainly in the fact that some use secondary data in order to make international comparison of the certain national intellectual capital indicators, while other focus on primary data with the objective to use the obtained information about intellectual capital for the internal strategic guidance perspective (Salonius & Lönnqvist, 2012, p. 333) and decision making on national intellectual capital (Labra & Sánchez, 2013, p. 585). In general, it is possible to identify two approaches in classifying and measuring intellectual capital (Labra & Sánchez, 2013, p. 587): one stemming from the research of intangibles by academics and professionals, and other developed by international organizations aiming at studying competitiveness, innovative capacity and development at the level of national economies.

The first attempts of valuing national intellectual capital are linked to Sweden and research conducted by Caroline Stenfelt and Madeleine Jarehov under the supervision of Leif Edvinsson in 1996 (Edvinsson & Stenfelt, 1999). These authors attempted to quantify the factors which determine the future success of Sweden by employing the Skandia Navigator. After presenting first prototype of the intellectual capital of nations, Leif Edvinsson and his team have worked continuously on the improvement of their research and they have identified five key indicators for determining position, evolution, speed and direction of future development of national intellectual capital: innovations, external relations and exchange of knowledge, human capital, information technologies and entrepreneurship (Edvinsson & Stenfelt, 1999, pp. 25-28).

Deriving from this study, and with the help of Edvinsson and Stenfelt, similar research has been conducted in Israel during 1997 by the Edna Pasher PhD and Associates (Pasher & Shachar, 2005). Their research project was divided in four phases (Pasher & Shachar, 2005, p. 141):

- The first phase was orientated toward shaping the vision of a country to serve as a research benchmark;
- The second phase was devoted to the core competencies needed for the vision achievement;
- The third phase was orientated toward determining the key success factors for each competence; and
- The forth phase was oriented toward determining the indicators for each factor.

The core competences, key success factors and indicators were clustered, according to Skandia model, into four categories: renewal and development capital, human capital, market capital, and process capital (Pasher & Shachar, 2005, p. 142). After that numerous studies have been conducted in different countries and regions. Some of them are: Bontis (2004) for the Arab region; Bounfour (2003), Edvinsson and Bounfour (2004), Andriessen and Stam (2004), Pulic (2005), Weziak (2007) for the EU countries; Lin

and Edvinsson (2008) for the Nordic countries; Lin and Edvinsson (2011) for 40 countries; Pöyhönen and Smedlund (2004) for a cluster in the eastern part of Finland; Schiuma et al. (2008) for the Italian regions; Huggins et al. (2014) for 546 regions; etc.

One of the interesting study is certainly study conducted by Andriessen and Stam (2004) for the EU countries. These authors developed Intellectual Capital Monitor for the measurement of intangibles comprising of three components: human, structural and relational capital, and three different perspectives: assets, investments and effects, in order to highlight the significance and changes between past, present and future developments. Their 3x3 matrix is filled with 38 performance indicators for measuring the intellectual capital. Based on the research results they concluded that (Andriessen & Stam, 2004, pp. 17-18):

- Leading economies have substantially greater value of both human and structural capital;
- Investments in intellectual capital pay off, since there is strong and significant correlation between investments and assets;
- Low values of intellectual capital assets seem to be a guarantee for low intellectual productivity.

Another important study is the one conducted by Bontis (2004) for the 10 countries from the Arab region. This study is also based on Skandia model where intellectual capital encompasses four key components: human capital, process capital, market capital and renewal capital. Thus, National Intellectual Capital Index represents the average value of four partial indexes: National Human Capital Index (seven indicators), National Renewal Capital Index (seven indicators), National Market Capital Index (three indicators), and National Process Capital Index (eight indicators). Once, these indexes were calculated the structural equation map was developed and the links among indexes were established. Based on the conceptual map the national wealth of Arab countries was directly determined by human and market capital, while process capital had direct influence on renewal and market capital, renewal capital directly influenced human capital, and human capital also had direct influence on process capital (Bontis, 2005, p. 131). The results provided on this structural map are important since “they clearly indicate that the weighting of components may be based on the analysis of inter-relational dependencies rather than speculative choices (Stähle, 2008, p. 10).

Also, Edvinsson and Bounfour (2004) developed the IC d-VAL<sup>®</sup> for measuring intellectual capital of nations and regions. This measure is comprised of four dimensions – resources, processes, assets and outputs. For each dimension a benchmarking process with the best performers is conducted, and performance indexes and composite index per country are calculated. These authors applied the proposed framework for benchmarking the performance of EU countries.

As mentioned earlier in the study, second approach focuses only on partial indicators within different methodologies proposed by numerous international institutions, such as: the World Bank – Knowledge Assessment Methodology, the INSEAD – Global Innovation Index, the World Economic Forum – Global Competitiveness Index, the International Institute for Management Development – World Competitiveness Index, the United Nations Development Programme – Human Development Index, the European Union – Innovation Union Scoreboard, the Organization for Economic Cooperation and Development – Science, Technology and Industry Outlook, etc. These models report rankings of countries similar to those proposed by previously described models, but opposed to the academic models which

determine the intellectual capital as an independent factor comprising only indicators of intangible assets, the international organization models combine the indicators of tangible and intangible assets to determine competitiveness, innovation capacity, or development of a country without clear identification of intellectual capital (Labra & Sánchez, 2013, p. 588).

However, these international organization models are widely accepted by policy makers and much more used than models exclusively dealing with intellectual capital. This is due to the fact that policy makers are not yet familiar with the concept of intellectual capital, even though the elements of national intellectual capital such as national brand or competence level are highly valued (Salonius & Lönnqvist, 2012). As the knowledge and acceptance of composite indexes grow among policy makers, the importance of presented models for understanding and managing intellectual capital of national economies will grow as well. Nonetheless, no consensus yet exists on the evaluation models or the indicators.

## Conclusion

During last decades intellectual capital has become the most important source of value, wealth and prosperity. Expansion of knowledge based business activities and technological revolution have led to the economic transformation at micro and macro level, and hence raw materials and labour are no longer the main source of value creation, but capabilities of creating and using the knowledge resources.

These intangible assets are important for companies and their stakeholders, as well as for the macroeconomic policy makers. Namely, intellectual resources are principal source of competitive advantage which must be identified, measured and controlled in order to obtain efficient management in companies, and besides, these resources are key drivers of growth and competitiveness in an economy and their measurement is crucial for designing and implementing public policies.

National intellectual capital incorporates hidden values of individuals, firms, institutions, communities and regions which are the source of wealth, competitiveness and productivity of nations. These hidden values represent the base for the future development, and hence it is necessary to map the intellectual resources in a country in order to systematically monitor the development of national intellectual capital. Therefore, it is necessary to find a consistent and reliable measure of the national intellectual capital that can help governments to improve the management of the intangible resources which are key determinants of the success of an economy.

This paper addressed numerous models for measuring the intellectual capital of national economies. Although the measurement of national intellectual capital is widely leaned on the microeconomic concept of intellectual capital measurement, consensus does not exist among researches about key indicators which best capture the value of intellectual capital of nations. Namely, different researchers differently group indicators within partial indexes and this undermines the possibility of comparative analysis of the intellectual capital of different countries.

The other issue is related to measurement and metrics, since even when the model is well structured and consistent, it does not provide straightforward guidelines for valuing the relationship among the subcomponents of intellectual capital and hence it is hard to ensure the validity of the index (Stähle, 2008, p. 7). Additionally, the suggested models combine

different indicators into a composite index based on a hypothetical weights instead of the established relations between the subcomponents.

Bearing all this in mind, future research should be focused on resolving several issues in order to adequately capture the value of intellectual capital and its contribution to the economic growth and national wealth. First, the clear definitions and classifications of intellectual capital components should be determined. Then, the relationships between intellectual capital components should be clearly established and based on these relationships the proper weights should be determined to each subcomponent. Finally, when determining the contribution of intellectual capital to the economic growth other non-intellectual capital factors should be taken into account as well.

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## PRODUCTION AND EXPORT OF RASPBERRY FROM THE REPUBLIC OF SERBIA<sup>2</sup>

### Abstract

*Raspberry is the most important and the most profitable export commodity in the structure of agricultural exports. It is exported at an average price of 2.7 USD/kg, mainly frozen and mostly to the markets of Germany, France and Belgium. Therefore, this paper, in addition to data on raspberry production in Serbia and world raspberry production, also presents the volume and value of frozen raspberry exports from the Republic of Serbia in the period 2010-2015, the dynamics of frozen raspberry exports from Serbia to leading export markets as well as to the frozen raspberry markets of Serbia's main competitors.*

**Keywords:** raspberry, production, export, market.

**JEL classification:** Q10, Q13, P42

## ПРОИЗВОДЊА И ИЗВОЗ МАЛИНА ИЗ РЕПУБЛИКЕ СРБИЈЕ

### Абстракт

У структури извоза агроиндустријских производа малина представља најзначајнији и најпрофитабилнији извозни производ. Извози се по цени просечно 2,7 УСД/кг и то углавном замрзнута највише у Немачку, Француску и Белгију. Стога је у овом раду, поред података који дају приказ производње малине у нашој земљи и у свету, дат приказ количине и вредности извоза смрзнуте малине из Републике Србије за период 2010-2015. година, динамика извоза смрзнуте малине из Србије на водећим извозним тржиштима, као и извозна тржишта водећих конкурената Србије на тржишту смрзнуте малине.

**Кључне речи:** малина, производња, извоз, тржиште.

### Introduction

Raspberry is the most profitable fruit species the production of which started in Serbia after World War I (around 1920), and has expanded significantly during recent

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years. Factors that contributed to its development and intensification of its production are primarily high yield and long-lasting export to the world market. High economic results achieved in the production process as well as generating profits were crucial in the decision to invest in perennial plantations of raspberries and start economically profitable business. Thus, individual family farms gradually developed into family businesses with a closed production cycle, from raising raspberry plantations to purchasing small cold storage plants for freezing raspberries (dissertation). Most fresh raspberries are sold and consumed during the summer season. The majority of raspberries produced in Serbia are exported frozen (95%), and only a small amount is exported fresh.

Special economic importance of raspberry production is determined by the following groups of factors:

1. the relatively large value of production, income and profit per unit of invested capital and labour;
2. labour-intensive nature of production, which significantly reduces the problem of unemployment in many areas of the Republic of Serbia;
3. the impact of raspberry production on the overall economic development, which is achieved by building and expanding the capacities of the food industry, by indirect influence on the development of ancillary economic activities, by significant net foreign currency effects, and particularly by investing substantial amounts in infrastructure (particularly construction of local roads) as a basic requirement for the overall social and economic development (*Misic et al., 2004*).

Intensive raspberry production requires organized approach to improving product quality, increasing the economic efficiency of primary production and processing as well as the active role of the state (providing loans for production of exported commodities under favourable conditions, protection of raspberry as a product of national interest, etc.).

## **Raspberry production in the Republic of Serbia and world raspberry production**

Raspberry production is concentrated in western and southwestern parts of Serbia in small farms (about 60,000 households) with an average area of 0.25 ha.

There are several regions in Serbia where raspberry production is widespread: 1. *Valjevo region* (Podgorina and Pocerina), 2. *Sabac region* (Nis, Loznica, Bajina Basta), 3. *Kosjeric region* (Povlen-Varda), 4. *Arilje region* (Arilje), 5. *Ivanjica region* (Ivanjica, Kaon, Kotraza, Guca), 6. *Cacak region* (Cacak and Kablar), 7. *Kopaonik region* (Brus and its surroundings), 8. *Kraljevo region* (Kraljevo, Dragacevo), 9. *Leskovac region* (Leskovac). The greatest part of raspberry production is concentrated in the areas of the following municipalities: Kosjeric, Uzice, Arilje, Pozega, Ivanjica, Valjevo, Mionica, Osecina, Koceljeva, Krupanj, Ljubovija, Gornji Milanovac, Cacak, Lucani, Brus, Aleksandrovac.

Intensive raspberry production has recently begun in almost all parts of our country on smaller areas and due to its profitability in other regions with less optimal conditions for this type of production as well.

In underdeveloped hilly-mountainous regions a problem that accompanies raspberry production is poor and inadequate infrastructure, while long tradition in raspberry production is its great advantage. However, production of the world’s most advanced and highest quality raspberry varieties should be stimulated instead of relying on the old varieties without significant potential. Farm specialization and formation of farmers’ associations and organizations is also necessary so that the producers themselves can be more informed about the latest trends in growing raspberries. It is necessary to provide direct assistance to producers through production training seminars.

Another problem in raspberry production is certainly the outflow of labour from rural areas and rising number of elderly households. It is therefore necessary to create conditions for young people to return to the countryside. On the other side, there is enough uneducated and unskilled labour force to perform seasonal jobs, especially in “the rush of harvest”. However, as our people lack interest in performing these jobs, labour force is imported from Romania and Bulgaria. In order to improve this situation it is necessary to comply with the regulations of the EU, especially in terms of hygiene and respect for human rights during the harvest, and also in terms of education and professional training of workers.

Raspberry production is an exceptional opportunity for development of agriculture and overall economy of Serbia. It can be accomplished by increasing the economic efficiency of both primary production and processing and improvement of product quality.

Important factors to achieve good economy are the large flexibility of the producers, and many advantages of such a fragmented production as:

- Low-cost investments without many inputs: only the planting material and plant support system.
- Developed necessary infrastructure of roads, cold storages, market places, etc.
- Quick return on investment – but, from the second year.
- Involvement of unemployed family members in crop maintenance and harvest. In this way growers can provide a cheaper product and gain higher incomes.
- Easier managing that reduces the economic impact of low prices and hard sale conditions. Small producers tolerate easier the reduction in yield or no yield of some years (Nikolić and Tanović, 2012).

According to the 2012 Census of Agriculture, the orchards in the Republic of Serbia occupy a total of 295,203 ha. Plantation orchards occupy an area of 98,575 ha and extensive orchards occupy 64,736 ha (Table 1).

**Table 1. The surface area and structure of orchards according to the 2012 Census of Agriculture**

	Agricultural holdings,number	Orchards (ha)		
		total	plantation	extensive
Republic of Serbia	295.203	163.310	98.575	64.736

*Source: Census of Agriculture 2012, Book I*

According to the same data source, raspberry plantations in our country occupy an area of 11.041 ha. The most widely spread are plums ( 77,949 ha), followed by cherries ( 13,990 ha) and apples ( 23,737 ha). They are followed by peaches ( 8,012 ha), pears (7,343 ha), nuts( 4,787 ha), etc.

Raspberry production in Serbia in the period 2006-2015 is shown in Table 2. It reveals that the average production in this period was 76,807 t with an average yield of 5.7 t / ha generated on an average area of 13,579 ha.

**Table 2. Raspberry production in Serbia in the period 2006-2015**

Year	Republic of Serbia		
	Area under raspberries (ha)	Total yield (t)	Yield (t/ha)
2006	15.024	79.680	5,3
2007	14.496	76.991	5,3
2008	14.680	84.299	5,7
2009	14.957	86.961	5,8
2010	15.174	83.870	5,5
2011	15.354	89.602	5,8
2012	11.996	70.320	5,9
2013	12.024	68.458	5,7
2014	11.040	61.715	5,6
2015	11.041	66.176	6,0
<b>Average</b>	<b>13.578,6</b>	<b>76.807,2</b>	<b>5,7</b>

Source: Statistical Office of the Republic of Serbia, Statistical Yearbook of the Republic of Serbia, 2007-2016

Furthermore, according to the FAO, *Serbia is among the world's leading raspberry producers*. In the research period 2010-2014, Serbia ranked 4th in raspberry production. Among the world's leading raspberry producers, only the USA achieved higher yields than Serbia (all years observed) and the Russian Federation in 2013 and 2014 (Table 3).

**Table 3. Top five producers of raspberries in the world in the period 2010-2014<sup>1</sup>**

Research year, raspberry production and yield		Countries				
		Russian Federation	Poland	USA	Republic of Serbia	Ukraine
2010	Production (t)	125.000	92.864	88.020	<b>83.870</b>	25.700
	Yield (t/ha)	4,8	3,1	8,7	<b>5,5</b>	5,0
2011	Production (t)	140.000	117.995	109.502	<b>89.602</b>	28.100
	Yield (t/ha)	4,9	4,4	10,9	<b>5,8</b>	5,5
2012	Production (t)	133.000	127.055	84.300	<b>70.320</b>	30.300
	Yield (t/ha)	5,1	4,5	12,0	<b>5,9</b>	6,1
2013	Production (t)	143.000	121.040	83.280	<b>68.458</b>	30.411
	Yield (t/ha)	8,9	4,2	11,1	<b>5,7</b>	15,5
2014	Production (t)	144.000	125.859	103.510	<b>61.715</b>	35.627
	Yield (t/ha)	8,7	4,5	13,1	<b>5,6</b>	15,2

Source: FAOSTAT, <http://www.fao.org/faostat/en/#data>.

<sup>1</sup> The list of countries should be supplemented by Chile. According to FAO data, the

*average raspberry production in Chile in the period 2010-2014 was only 3,120 tons, and according to International Raspberry Organization - IRO, the average raspberry production in Chile was around 50,981 tons in the period 2009-2013*

### **The volume and value of frozen raspberry exports from the Republic of Serbia**

The key indicator of the development of agriculture and food industry of a country is the export of agricultural products. Therefore, export is of great importance from the point of view of the national economy. A large number of factors influence the placement of agricultural products in the international market, of which the most important are: price, quality, competitiveness, certain administrative measures of state bodies, etc.

In the period January-August 2016, Serbia exported 2 billion USD worth of agricultural products. This export level is by 7.1% higher than in the same period of the previous year. The most important export products were: maize worth 207 million, cigarettes worth 199 million, frozen raspberries worth 172 million, and wheat worth 101 million. When considering export by commodity group, the best result is achieved by fruit and vegetables with export worth 547 million USD, accounting for 5.6% of the total exports of commodities. Wheat and grain-based products were exported for 450 million USD, accounting for 4.6% of the total exports of commodities. (Agribusiness - sectoral overview September 2016, Serbian Chamber of Commerce).

Serbia is the world's leading country in terms of the value of frozen raspberry exports. To find a place in the global market where competition is ever more present and more brutal, one needs to focus on quality, professionalism, price, etc. Export prospects are great because raspberries from Serbia are, among other things, considered a “healthy-safe food” as well. Export demand for Serbian raspberries is significant and stable.

In the period 2011-2015, the average value of exports from the Republic of Serbia amounted to 241,756 USD. Average volume of frozen raspberry exports amounted to 96,399 tons and the average unit value of exports amounted to 2.5 USD / kg (Table 4).

**Table 4. Leading exporters of frozen raspberry in the world by value of exports in the period 2011-2015**

Rank	Countries	Average value of exports, (thousands of USD)	Average volume of exports (ton)	Average unit value of exports (USD/kg)
1.	<i>Republic of Serbia</i>	241.756	96.399	2,5
2.	Poland	171.721	101.725	1,7
3.	Chile	168.394	56.320	3,0

<sup>1</sup> Product code: 081120 - includes frozen raspberries, blackberries, mulberries, loganberries, currants and gooseberries.

Source: International Trade Centre (ITC), Trade Map, <http://www.trademap.org/Index.aspx>.

In terms of value and volume of frozen raspberry exports, Serbia's main competitors in this market are Poland and Chile. Average export volume of frozen raspberries from Poland is 101,725 tons and 56,320 tons from Chile.

In terms of the value of exports, frozen raspberry was among the top 10 Serbian export products in the period 2010-2015 (Table 5). Export ranking of frozen raspberries increased over time, so that in 2015 this product was in 6th place regarding the value of exports.

**Table 5. Serbian frozen raspberry exports (with no sugar added) in the period 2010-2015**

Year	Ranking of frozen raspberries among the top 10 Serbian export products	Exports, volume (t)	Exports, value (000 USD)	Unit value of exports (USD/kg)
2010	7	61.494,2	165.578,2	2,7
2011	7	73.547,8	176.471,4	2,4
2012	10	64.268,1	135.648,1	2,1
2013	10	61.416,9	187.357,7	3,1
2014	8	73.252,6	236.517,6	3,2
2015	6	93.713,6	267.945,4	2,9

Source: Statistical Office of the Republic of Serbia <http://webzrs.stat.gov.rs/WebSite/public/ReportView.aspx>.

The average export price of frozen raspberries was 2.7 € per kg, and it depends on the quality, produced and offered quantities, logistics, drying and packaging.

The price of labour in raspberry production in our country is about five times lower than in the EU countries. Unlike the countries of the European Union where raspberries are grown with the use of advanced technical and technological practices, in our country raspberries are cultivated manually. Purchase price or sales price of raspberries is a constant cause of conflict between producers and purchasers who are actually the owners of cold storage plants for freezing fresh fruit. The solution to these problems would greatly contribute to greater income in foreign exchange for all participants in the production chain.

Frozen raspberries from Serbia are predominantly exported to the markets of: Germany, France, Belgium (Table 6). The dynamics of frozen raspberries exports from Serbia into leading export markets in the period 2011-2015 is shown. Exports to Germany increased in this period and amounted to 98.570 USD in 2015. The value of frozen raspberries exports to France was also the highest in 2015 (61,562 USD), while the exports to Belgium showed no major oscillations in this period. Countries of the EU which are deficient in raspberry and have a relatively high living standard, characterize raspberry as a healthy-safe food. Therefore, its exports are promising and can significantly increase with appropriate marketing measures.

**Table 6. The dynamics of frozen raspberry exports from Serbia into leading export markets in the period 2011-2015 - value of exports in thousands of USD -**

	2011	2012	2013	2014	2015
1.Germany	75.003	63.501	80.164	90.600	98.570
2.France	40.874	35.315	47.011	56.779	61.562
3.Belgium	23.782	23.251	29.913	29.310	29.622

<sup>1/</sup> Product code: 081120 - includes frozen raspberries, blackberries, mulberries, loganberries, currants and gooseberries.

Source: International Trade Centre (ITC), Trade Map, <http://www.trademap.org/Index.aspx>.

If we look at 2011 as the base year for analysis and 2015 is the comparison year, we can notice that the value of frozen raspberry exports from Serbia increased: into the German market by 31.42%, into the French market by 50.61% and into the Belgian market by 24.56 %.

As indicated above, Chile and Poland are Serbia's strongest competitors in frozen raspberry market. The following table (Table 7) presents frozen raspberry markets of Serbia's strongest competitors.

**Table 7. Export markets of Serbia's leading competitors in the frozen raspberry market - value of exports in thousands of USD -**

	2011	2012	2013	2014	2015
<b>Poland</b>					
1.Germany	48.054	50.069	63.660	61.150	60.764
2.Belgium	16.390	14.810	27.025	25.727	22.011
3.Holland	11.744	9.683	14.629	16.043	13.394
4.Great Britain	9.790	11.485	14.422	15.595	12.959
5.France	9.101	9.467	12.185	15.544	11.921
<b>Chile</b>					
1.USA	60.810	52.962	64.881	87.042	81.859
2.Canada	19.077	17.731	26.496	24.524	30.663
3.Australia	10.483	8.387	11.478	13.739	11.699
4.France	13.027	13.235	14.361	8.602	10.770
5.Holland	14.367	7.437	12.119	10.205	9.108

<sup>1/</sup> Product code: 081120 - includes frozen raspberries, blackberries, mulberries, loganberries, currants and gooseberries.

Source: International Trade Centre (ITC), Trade Map, <http://www.trademap.org/Index.aspx>.

With regard to the orientation of frozen raspberry exports, Serbia's main competitor is Poland, considering the fact that its export markets are largely compatible with Serbia's export markets.

## Conclusion

Serbia has the potential to produce, process and develop high-quality assortment of agricultural products and to increase exports of agricultural and food products into the European and world market. Favourable agroecological natural resources and potentials for agricultural production are not used sufficiently, which is reflected in yields lower than potential yields, and compared to the countries of the European Union.

Raspberry is our most important export product in the field of agro-industrial products. In previous research period, our country has achieved significant results in raspberry exports into the international market. A significant trend in increasing exports



is encouraging. Raspberry is mostly exported to Germany, Belgium and France, and Serbia's strongest competitors are Poland and Chile.

In order to strengthen the already acquired position and simultaneously win new export markets for raspberries, it is necessary to define general policy, to examine perspectives and to establish long-term programs for raspberry production and processed raspberry production in accordance with the requirements and demand of the European and world market. The support of the Ministry of Agriculture is necessary in joint planning with raspberry producers regarding the purchase price of fresh raspberries in the following period, as well as assistance through subsidies and loans in the production process.

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## MINIMIZING INJURY INCIDENCE RATE FOR MEMBERS OF THE FIRE RESCUE BRIGADES - SYSTEMATIC APPROACH

### Abstract

*The objective of the research is the identification and determination of requirements of the members of fire rescue brigades during the interventions in the conditions of high risk in order to minimize the possibilities for injuries during the intervention. Results indicate that almost half of respondents need further education for the purpose of identification, assessment and management of the risks that can lead to emergency situations and that education would be helpful in acquiring knowledge and abilities to help jeopardized population. Systematic overview of objectives, necessary measures and research activities is given as a guideline for improvement of domestic national system of emergency situations management.*

**Key words:** fire rescuers, integrated safety system, injury incidence, risk assessment

**JEL classification:** I31, J28

## МИНИМИЗИРАЊЕ УЧЕСТАЛОСТИ ПОВРЕДА ПРИПАДНИКА ВАТРОГАСНО-СПАСИЛАЧКИХ БРИГАДА - СИСТЕМСКИ ПРИСТУП

### Апстракт

*Циљ истраживања је идентификација и утврђивање услова за припаднике ватрогасно-спасилачких бригада током интервенција у условима високог ризика у циљу минимизирања могућности настајања повреда током интервенције. Резултати показују да је скоро половини испитаника потребна додатна едукација у циљу идентификације, процене и управљања ризицима који могу довести до ванредних ситуација и да би едукација била од помоћи у стицању знања и способности да се помогне угроженом становништву. Систематски преглед циљева, неопходних мера и истраживачких активности презентован је као смерница за унапређење домаћег националног система управљања ванредним ситуацијама.*

**Кључне речи:** ватрогасци-спасиоци, интегрисани систем безбедности, инциденца повреда, процена ризика

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## Introduction

In recent years, topicality, unpredictability and severity of emergencies have encouraged numerous discussions and raised series of questions regarding the issue of occupational (Chen et al., 2015) and environmental safety in emergency management (Qin et al., 2014). Given the increasingly complex current challenges, the capacity of problem solving surpasses the abilities of individuals and requires coordinated action of all participant who are responsible for crises management (Boin, 2009; Kazmierczak, 2011). According to Helsloot, it seems to be common scientific knowledge nowadays that command and control in crisis management is an old-fashioned concept but that it is coordination that we should strive for (Helsloot, 2008).

There is an issue of building an adequate system of crisis management at the state and other forms of political-territorial organization level, but also in public enterprises, the profit sector and education, and other areas. It is necessary for this system to be conceptually and software designed and scientifically based and founded. In addition, it has been investigated in what way the education, as the fundamental prevention measure in the complex system of protection and safety of the environment can respond to the current workplace requirements of the members of fire brigades. Of global social interest and significance is that through the process of permanent influence on the individual, his knowledge and skills, habits, attitudes and behaviour is possible to develop the safety awareness, culture of crisis management, that is, prevention or avoidance of the risks in the working and living environment that can lead to crises, emergencies, fatalities and the loss of natural and material assets (Živković, 2011). The occupational and environmental safety is an essential need, value and interest of each individual and humankind as a whole, which is closely related to the conditions of both existence and sustainable future development.

## Scientific and social significance of the research

Region of the Southeast Europe is increasingly threatened by different types of natural disasters, of which some occur suddenly, unexpectedly and are life-threatening. They occur in different forms and sizes like floods, droughts, extremely high temperatures, earthquakes, landslides, storms etc. (Keković & Kešetović, 2006). Minimizing the impact of disasters requires effective management of the emergency through coordination of resources and actions from the many different responding organizations (Ford & Schmidt, 2000). Over the years, the European Union (EU) has developed a series of capacities in order to coordinate the respond of the member states to natural disasters and foreign crises (Boin, Ekengren & Rhinard, 2013). Through the completely new Emergency Response Centre that is engaged in activities to raise the awareness among people on the importance on how every moment is important for saving the human lives, as well as the field training in simulated emergencies, Emergency Response Coordination Centre (ERCC) operates within the European Commission's Humanitarian Aid and Civil Protection department (ECHO) and coordinates the joint assistance in disasters, both in Member States and in all other countries affected by disasters (Hollis, 2012). The EU supports states outside the EU through different civilian and military missions

(Tercovich, 2014). National governments can not deal with these crises unilaterally, nor can they isolate themselves from these threats. The world, especially Europe, becomes too connected and intertwined to avoid any crisis.

A combination of mentioned factors requires comprehensive strategy for the protection and rescue in emergency situations that includes the systems for prevention, protection and rescuing, mitigation and renovation (Mastrjukov, 2005). Serbia is now in the process of harmonization of overall legislative and institutional framework with numerous international requirements and standards in the field of emergency situations management. For the Republic of Serbia, the year 2009 has marked a new beginning in the development of a national system for emergency management by enacting the Law on emergency situations “Official Gazette of the Republic of Serbia” no. 111/2009, 92/2011, 93/2012). The integrated approach to emergency situations management aims to contribute to the safety of the people; occupational and environmental safety and in this effort Serbia enjoys the support to membership in the Regional Cooperation Council for the South Eastern Europe - DPPI (Disaster Preparedness and Prevention Initiative), the European Council EUROPA and International Strategy for Disaster Reduction - UNISDR.

Taking into account the presented facts, it is important to emphasise how important and necessary is to continuously explore in the area of safe working and living environment, bearing in mind that oncoming disasters and risks put modern society and its knowledge about them to the test so it is necessary to permanently and responsibly direct capacities of all relevant factors to the study of these phenomena.

By analyzing the available literature that deals with the research of safe and healthy working conditions for the members of fire rescue brigades, authors have concluded that there was very little progress in research of safe and healthy working conditions for members of fire rescue brigades during their interventions. Namely, very few authors have tried to deal with this issue, which was unfairly neglected, even though it is known that workplace of firemen is a workplace with an increased risk. The profession of firemen-rescuers is very demanding both from a psychological and physical aspect, where the risk of exposure to hazards is usually high. During the performance of working activities, the firemen are regularly exposed to very hazardous and traumatic occurrences. The analysis of available literature that deals with this issue led to the conclusion that most of hazardous traumatic occurrences can lead to the situation that involves the loss of life, physical injury, coping with death and injuries of colleagues and people assisted through (Moran & Britton, 1994; Beaton et al., 1999).

## **Subject, goal and tasks of the research**

Modern safety challenges, risks and threats have increased the interest for problems of occupational and environmental safety. Members of fire rescue brigades as one of the subjects of an integrated system of safety, protection and rescuing of people, assets and environment in general are the subject of this research in the context of the occupational and environmental safety. The research is directed to:

- Examination, determination and identification of factors that affects the increased number of occupational injuries of the members of fire rescue

brigades during their intervention;

- Identification of problems they are facing during the intervention;
- Consideration, understanding and finding the possibilities for realization of all possible solutions for overcoming the current problems in this area.

Bearing in mind that the nature of work of the fire rescue brigades involves well-organized and coordinated actions which enables the saving of human lives and assets, it is of great importance to research and find the best possible models and methods for successful performance of their tasks with the prerequisite that during such performance the participants are protected to the maximum, i.e. to provide them with safe working conditions. Through the variety of research and collection of attitudes and relevant opinions it is necessary to determine in which way is necessary to implement a good governance, to enable an appropriate decision making, uninterrupted and positive communication, successful resolution of various disputes and conflicts in the team that has very important task of rescuing the people and assets in the case of emergency situations. Identification of hazards, risk assessment (Архипова & Кульба, 1998) and establishment of risk management through the permanent education and training of the employees are the guidelines that will lead to healthier, safer and more productive working environment. Apart from necessary qualification and training, it is essential that members of fire rescue brigades are adequately equipped with personal and safety equipment of a high quality, and with means for extinguishing a fire, in order to reduce the possibilities of injury and even fatalities.

Along with the analysis of the current situation in relation to what is to be achieved with the tendency of gaining the insight between what “is” and what “will be”, author’s opinion is that the research in this areas and dealing with this issue shall contribute to a general social interest, and all for the purpose of raising the safety awareness, culture of crisis management, that is, upgrading, prevention or avoiding and minimization casualties and disruption of natural resources and assets. The research goal is the identification and determination of requirements of the members of fire rescue brigades that operate in the conditions of a high risk, and all for the purpose of reduction of possibilities for injury during the intervention. The research should contribute to scientific “refreshment” of this issue and to establishment of more adequate projection of the model of safe and healthy working environment for the members of fire rescue brigade. Based on the afore mentioned goal, the theoretical and practical research tasks are formulated. Theoretical tasks of the research are:

- Defining and determination of basic research terms;
- Analysis of the nature of employment of the members of fire rescue brigades;
- The experience in the previous work with regard to the number and type of intervention;
- Analysis of the situation in the area of occupational safety and health of the members of fire rescue brigades with regard to the number of occupational injuries and occupational diseases.

## Hypothetical framework of the research

General hypothesis:

Fire rescue brigades that have more complex tasks tend to be more skilled, trained and technically equipped.

For the purpose of processing data, the following statistical methods were used: frequency, percentage, arithmetic mean and standard deviation.

## Results and discussion

First, the structure of the sample regarding the employment status of the respondents and the examined sociodemographic variables was checked. Results are presented in the tables. The total number of respondents in the sample is 45, and the percentages presented in the tables are calculated according to this number.

The results imply that all respondents are the members of professional fire brigades; all except one are the members of the local government fire departments. Just over three-quarters of respondents have secondary education, and only 10 respondents have higher levels of education. Two-thirds of respondents said to have technical-technological education background, while 15 respondents said to have social science and humanities education background or natural science and mathematical education background. In terms of age, the sample is diverse, with respondents in all three categories, although most respondents fall into the category from 31 to 45 of age. Out of total number slightly less than one-third of respondents are in managerial positions. Having this in mind, during a comparison by group, the comparison by type of fire brigade will not be carried out, because they all are the members of professional fire brigades, as well as for the formation that fire brigade belongs to, because all but one are the members of fire departments of local governments. In terms of education, taking into consideration the distribution of respondents by category, the comparisons are carried out between respondents with a high school education and those with the higher levels of education. In terms of the nature of education, the comparison is carried out between the respondents with technical-technological education and others.

*Table 1 The statements of the respondents about the frequency of different types of emergency situations*

Type of emergency situation	Arithmetic mean	Standard deviation	Minimum	Maximum
Natural character (earthquakes, floods, landslides, forest fire)	3.69	2.494	0	10
Technical-technological character (traffic accidents, fire on electric installations, explosions, accidents in industry)	3.98	2.547	0	10
Ecological character (degradation of natural environment)	0.42	0.587	0	2
Terrorist acts, consequences of violence	1.34	1.599	0	10



When it comes to frequency of different types of emergency situations, it can be seen that respondents on average clearly emphasize the emergency situations of natural and technical-technological character. Emergency situations that are the consequence of terrorist acts and violence are rarely cited, while the rarest are emergency situations of ecological character.

When it comes to frequency of respondents' answer to a question on impact of special territorial-safety conditions in which they live on occupational and environmental safety, all 45 respondents stated that these conditions have such impact.

Distribution of respondents' answers to a question on importance of respondents' skills for application in the phases of prevention of emergency situation and intervention in emergency situation are given in the following table.

*Table 2 Distribution of respondents' answers to a question on to what extent skills and abilities of respondents can apply in the phase of prevention-intervention of emergency situation*

In prevention phase?	Number of respondents	Percentage
Completely	18	40
Partially	27	60
In the intervention phase?	Number of respondents	Percentage
Completely	43	95.6
Partially	2	4.4

From the table it can be seen that almost all respondents believe that their skills and abilities are changeable in the intervention phase, but less than 50% believes that their skills are applicable in prevention phase. When it comes to the degree of familiarity of respondents with rights of employees that influence the occupational safety and health, these results are presented in Table 3.

*Table 3 Indicators of familiarity of respondents with rights that influence the occupational safety and health*

The employee's right	I am familiar with	I am partially familiar with	I am not familiar with
A) the employee prior to engagement is entitled to be introduced with the measures of safety and health at the place where he is assigned	9 (20.0%)	12 (26.7%)	24 (53.3%)
B) the employee has right to control his own health (preliminary of periodical medical examination of the employees) according to the risks of the workplace	9 (20.0%)	17 (37.8%)	19 (42.2%)
C) The employee is entitled to reimbursement for salary payment in the amount of average monthly earnings during the period of temporary inability to work caused by injury at work	16 (35.6%)	10 (22.2%)	19 (42.2%)
D) the employee is entitled to nutrition, accommodation and payment reimbursement during the professional training and education	20 (44.4%)	6 (13.3%)	19 (42.2%)
Right (Range of answers 1-completely familiar with, 3-not familiar with), less AS indicates a higher degree of familiarity	Arithmetic mean	Standard deviation	/

A) the employee prior to engagement is entitled to be introduced with the measures of safety and health at the place where he is assigned	2.33	0.798	
B) the employee has right to control his own health (preliminary of periodical medical examination of the employees) according to the risks of the workplace	2.22	0.765	
C) the employee is entitled to reimbursement for salary payment in the amount of average monthly earnings during the period of temporary inability to work caused by injury at work	2.07	0.889	
D) the employee is entitled to nutrition, accommodation and payment reimbursement during the professional training and education	1.98	0.941	
Note: in the table are presented frequencies (number of respondents) in the upper field, while percentage is presented in the lower field			

From the results is evident that about 50% of respondents stated that were not familiar with given rights, while others stated that were partially or completely familiar. In average, the respondents are the most familiar with the rights to nutrition, accommodation and salary compensation during the professional training and education, even though the variability of respondents' answers is the highest. The answers of the respondents indicate that they are less familiar with a right to become familiar prior to engagement with measures of safety and health in a workplace they are assigned to.

When it comes to injuries at work, the distribution of respondents' answers are given in the following table.

*Table 4 The number of respondents who stated that during the last year has suffered injury at work and factors to which contribute the occurrence of the injury*

Have you suffered an injury at work during the last year?	Number of respondents	Percentage
Yes	9	20.0
No	36	80.0
What hazard led to injuries?	Number of respondents	Percentage
Failures in management	1	2.2
Poor communication in a team	0	0
High risk of slipping and tripping	2	4.4
Exposure to high temperature	5	11.1
Exposure to	4	8.9
Demolition of parts of the building affected by fire	2	4.4
Work at height (hydraulic ladders)	0	0
Indirect contact of electrical installations and equipment under voltage	0	0
Danger caused by other endangered persons	0	0
Inadequate mobile equipment for extinguishing of fire	0	0
Obsolete personal equipment	0	0
Other hazards (respondents cited bomb explosion)	2	4.4
Note: The calculation of percentage regarding the answer to type of hazard that led to injury relates to total number of respondents in a sample.		

From the table it can be seen that 20% of respondents said that they have suffered an injury at work in the past year. When it comes to the type of danger that led to the injury, respondents most frequently cited exposure to high temperatures and smoke, while two respondents cited as a threat that led to injure due to the demolition of parts of the building affected with flame, slipping and stumbling and bomb explosion.

Next are the observed answers to questions on familiarity with the issues of occupational safety and health, and readiness for acquisition of new and upgrading of existing knowledge, skills and abilities in this area. Distribution of respondents' answers to these questions is given in the table below.

*Table 5 Distribution of respondents' answers on familiarity with the issues of occupational safety and health*

Are you familiar enough with the issues of occupational safety and health?	Number of respondents	Percentage
Yes	12	26.7
No	33	73.3
What are the main reasons for insufficient familiarity with these issues?	Number of respondents	Percentage
No answer	6	13.3
Lack of knowledge and failure to comply with regulations in the area of occupational safety and health	10	22.2
Irresponsible and inadequate behaviour of the employer in implementing the safety and health at work	9	20.0
Negligence and deprivation of rights of employees in the domain of occupational safety and health	9	20.0
Lack of information and training on occupational safety and health	11	24.4

From the results it is evident that almost three quarters of respondents believe that were not sufficiently familiar with the issues of occupational safety and health. Regarding the reasons for the lack of awareness, the respondents with almost the same frequency stated each of the four given answers.

*Table 6 Distribution of the respondents' answers to questions on readiness for acquisition of new knowledge, skills and abilities from the area of occupational safety and health, and about preferred methods and places for acquisition of this knowledge and previous experiences with training for response in emergency situations*

Would you like to acquire new or expand the existing knowledge, skills and abilities concerning the occupational safety and health?	Number of respondents	Percentage
Yes	44	97.8
No	1	2.2
In what way would you like to acquire certain knowledge for the occupational and environmental protection including the occupational safety and health?	Number of respondents	Percentage
Lectures in traditional face-to-face classroom	11	24.4
Group discussions	2	4.4
Self-education	1	2.2
Public lectures, panel discussions	4	8.9
Seminars, courses and workshops	28	62.2

Through the media	0	0
Where would you like to gain knowledge and skills required for work performance?	Number of respondents	Percentage
In the work organization	19	42.2
In the academic institution	1	2.2
At home	0	0
In a different education centres	25	55.6
Have you ever attended training, courses and seminars relating to practicing procedures and verification of action plan in emergency situations?	Number of respondents	Percentage
Yes	21	46.7
Occasionally	11	24.4
No	13	28.9

The data show that almost all respondents expressed their readiness to acquire new or expand the existing knowledge, skills and abilities in the area of occupational and environmental safety. As the main ways for acquisition of such knowledge they cited seminars, courses and workshops, as well as the traditional lectures; and as places where they would like to acquire these skills they cited different education centres and work organization. Approximately 30% of respondents stated that they did not attend any trainings, courses and seminars relating to practicing of procedure and verification of action plan in emergency situations. When asked about the type of the training they attended so far, out of 45 respondents 24 gave an answer to a question (of any type). From those 24 respondents, 15 answered with Elementary (elementary course), while 5 more respondents also stated Elementary but with additional specification - first aid, traffic accidents, elementary course of command; 3 respondents stated training for rescuing from the ruins and traffic accidents, while one respondent at type of the training stated the training at the workplace.

Distribution of the respondents' answers to a question regarding the cooperation with authorities and other services that have an important role in the occupational and environmental protection is given in the following table.

*Table 7 Distribution of the respondents' answers to a question regarding the cooperation with authorities and other services that have an important role in the occupational and environmental protection*

What is the cooperation with the competent authorities and other services that have a significant role in the protection of working and living environment?	Number of respondents	Percentage
Good	17	37.8
Mostly good	21	46.7
Bad	7	15.6

The table shows that 85% of the respondents, that is, a very big majority of respondents assessed cooperation with the competent authorities and other services in occupational and environmental protection as good or mostly good, while only 7 respondents assessed it as a bad.

The respondents were then asked to assess the degree of readiness they encounter in their organizations to support further education and upgrading for better safety of working and living environment. They were also asked to cite the factors which are an obstacle to such education, subjects that should be included in education programs in this area and the ways that could contribute to achievement of better preparedness for adequate and efficient reaction in the emergency situations. Distributions of the respondents' answers to these questions are given in Table 8 and 9.

*Table 8 Distributions of the respondents' answers to question on the degree of readiness they encounter in their organizations to support further education and upgrading for better occupational and environmental safety and on factors which are obstacles to such education*

Does your organization expresses readiness to support your further education and upgrading for better safety of your working and living environment?	Number of respondents	Percentage
Yes	29	64.4
No	15	33.3
Did not answer	1	2.2
Which of the following reasons represent an obstacle in your further education and upgrading?	Number of respondents	Percentage
Poor financial situation	17	37.8
Unsafe area where I live	7	15.6
Education centres are far away	6	13.3
The lack of prompt information on possibilities for desired learning	4	8.9
The unwillingness of management to give you the opportunity to continue your education and upgrading	1	2.2
Other reasons	1	4.4
The percentages in answer to a question about the reasons for obstacles are in relation to the overall sample, since in this question respondents had the opportunity to circle multiple answers.		

The table shows that about 65% of the respondents stated that in their organizations support them in further education and upgrading, while just over one-third do not have such support. When it comes to factors that present obstacles for further education and upgrading, the majority of respondents as a reason cited a poor financial situation (just over one-third). Other two most frequent reasons are the unsafe area where respondents live and remoteness of education centres. Four respondents as a reason cited the lack of prompt information regarding on possibilities for upgrading as a reason; two respondents circled the remained two options, respectively.

*Table 9 Distribution of the respondents' answers to questions about the subjects that should be included in education program in this area and about the ways that could contribute to better preparedness for adequate and efficient reaction in emergency situations*

How the education for occupational and environmental protection can help you?	Number of respondents	Percentage
In identification, assessment and management of risks in working and living environment that can lead to emergency situations (risk management)	21	46.7

In acquisition of knowledge and skills for management in emergency situations	16	35.6
In acquisition of knowledge and skills for helping jeopardized population (medical assistance during the evacuation and taking care)	21	46.7
Introduction to all subject of response to emergency situations and possibilities for joint work and cooperation	18	40.0
In acquisition of knowledge and skills to adequately inform and communicate with the public in the case of emergency situation	5	11.1
In exploring the possibilities and ways of recovering from emergency situations	10	22.2
Something else	0	0
In your opinion, what is the way for achievement of better preparedness for adequate and efficient response in the conditions of emergency situations?	Number of respondents	Percentage
By implementing the subjects from this area in school programs	4	8.9
By creating a special education programs from this area	5	11.1
Education of professional staff to deal with this issue	17	37.8
Education of all parties who are responsible for this issue	14	31.1
Permanent education and training of the competent services and bodies	3	6.7
Development of and access to appropriate literature on the subject (manuals, brochures, etc.).	5	11.1
For ensuring safe working and living environment, according to your opinion, is necessary	Number of respondents	Percentage
To organize workshops with members of different services	10	22.2
To publish manuals and technical literature in this area	2	4.4
To organize professional visits to departments in other countries	2	4.4
To organize learning from crises - work with the population	6	13.3
To engage an expert to conduct continuing education services in this area	3	6.7
To consistently obey and enforce regulations in this field	6	13.3
Better equipment and means of personal protection	13	28.9
Greater financial, material and technical support	14	31.1
As the respondents had opportunity to circle multiple answers, all presented percentages are related to the total number of respondents.		

When it comes to areas in which respondents want assistance from the education in the field of occupational and environmental protection in emergency situations, about 50% of respondents stated that they need further education for the purpose of identification, assessment and management of the risks that can lead to emergency situations. The same number of respondents stated that education would be helpful in acquiring knowledge and abilities to help jeopardized population. Fewer stated that it would be helpful to get familiar with all subjects of response to emergency situations and possibilities of joint work and cooperation, as well as to acquire knowledge and abilities for leadership and management in emergency situations through the education. Knowledge in the field of communication with the public is less frequently stated as knowledge that would help respondents.

When it comes to achieving the better preparedness for response in emergency situations, the majority stated that preparedness could be upgraded by educating the professional staff for this issue, as well as by educating all subjects responsible. One-third of respondents stated both as an important factors of better preparedness for adequate and efficient response in emergency situations. Creation of special education programs and access

to appropriate literature were stated by 5 respondents, while the number of respondents stating some of other reasons is even lesser.

When it comes to means and activities required for ensuring the safe working and living environment, according to respondents' opinion, the most important are financial and material-technical support, better equipment and means for personal protection. Slightly fewer respondents believed that it would be important to organize workshops with the members of different departments. Six respondents stated that learning from crisis situations-working with population should be organized and that for this purpose it is important to obey and implement regulations regarding this area. The remaining three offered options were selected only by a couple of respondents.

## Conclusion

Successful resolution of issues and problems regarding the protection of working and living condition requires a strong institutional basis, which could be accomplished by strengthening of capacities, good governance, facilitated flow of information and efficient coordination. It is necessary to establish stronger correlations between formal, informal and other forms of learning and education in order to introduce philosophy and practice of lifelong learning, that is, ability to update and upgrade knowledge and abilities throughout life.

Based on the results of the research, the following conclusions can be made:

Answers, attitudes and opinions of the respondents indicate that most of them shows highly express willingness and preparedness to further education and training, which is actually encouraging because only well trained and skilled firemen-rescuers can respond to all the challenges and dangers while protecting themselves, citizens, material goods and the environment in which they live.

It is important to note that the financial and economic situation is the main cause of outdated technology and equipment as well as for insufficient equipment of adequate personal protective equipment and resources.

Results indicate that there is a high awareness of firefighters-rescuers regarding their personal responsibility for the provision of adequate protection to the population in situations where their lives are jeopardized by some threatening danger.

Through most of the answers, attitudes and opinions, it can be concluded that respondents by their answers have confirmed research hypothesis and thus contributed to further efforts to view this issue as an issue of general social importance and interest.

Regarding the results of the research, after analysis of the respondent's opinions and answers, it seems advisable to point out to some objective and necessary measures and research activities that could be achieved in the following directions in regards to the futher advancement of national management of emergency situations in general:

- Content and topics in the area of protection of working and living environment, especially content in the area of occupational safety and health should be introduces in the national curricula of all institutions of education;
- To overcome or prevent barriers of population participation in activities of education concerning protection of working and living environment;
- To encourage the activities of the family, school, media and various social organization in developing educational needs for protection of working and

living environment, especially in the areas that are exposed to risks of occurrence of emergency situations;

- To provide a system of permanent education and learning in the field of protection of working and living environment both at the national and local level;
- To achieve a functional correlation of scientific-research organizations with the members of fire rescue brigades;
- To develop awareness and culture of the citizens' safety in the area of protection and rescuing and to reduce disaster risks;
- To establish and promote more efficient coordination and operative cooperation between the members of fire rescue brigade and all subjects responsible for the safety of working and living environment;
- To improve regional and international coordination and cooperation of monitoring the condition by information exchange and joint trainings of fire rescue brigades on safety issues of working and living environment.

This research does make important and significant contribution to improvement of domestic national system of emergency situations management in ensuring safe working and living environment in line with the current needs of working and living environment's safety. Further studies based on this research's model should be conducted with a wider range of respondents or even from different countries in order to analyze and compare their attitudes and opinions and improve their safety in general.

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## THE ROLE OF VALUE ADDED TAX IN THE ECONOMY OF SERBIA

### Abstract

Value added tax has been applied for six decades now and it doesn't represent a novelty in theory and practice. The aim of this paper is the effects of VAT on the economy and his relevance and position of total tax revenue. Authors emphasize significant share of this tax form in public finance of Serbia and the study is focused on a ten-year period 2005-2014. Using descriptive statistics and regression analysis, it's determined the strong and positive correlation between logarithms values of value-added tax and gross domestic product, value-added tax revenues, value-added tax and total revenues, but there is statistically no significant effect of observed variables.

**Key words:** VAT, GDP, total revenues, tax revenues, Serbia

**JEL classification:** C01, H2, H20

## УЛОГА ПОРЕЗА НА ДОДАТУ ВРЕДНОСТ У ЕКОНОМИЈИ СРБИЈЕ

### Апстракт

Порез на додату вредност се примењује више од шест деценија и не представља новину у теорији и праксу. Циљ рада је приказати утицај ПДВ-а на економију и његову значајност и позицију у укупним пореским приходима. Аутори истичу значајно учешће овог пореског облика у јавним финансијама Србије, а рад је фокусиран на десетогодишњи период 2005-2014. године. Користећи дескриптивну статистику и корелацију, утврђена је јака и позитивна корелација између логаритмованих вредности пореза на додату вредност и бруто домаћег производа, пореза на додату вредност и пореских прихода и порезе на додату вредност и укупних прихода, али не постоји статистички значај утицај посматраних варијабли.

**Кључне речи:** ПДВ, БДП, укупни приходи, порески приходи, Србија

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## 1. Introduction

Tax is a compulsory payment created by the government of a country from which main products and services are performed. They are one of the main instruments of an economic policy (Karolak, 2011, p. 54). The effect of taxes on economic activity is one of the main fields of public finance. Tax system presents the totality of tax forms in the economy, respectively it's set of taxes that are linked by common goals which taxation should achieve. They are continuously changing in response to economic, political and administrative developments (Arsić, Altiparmakov, 2012, p. 2). States use taxes to covering public needs in order to ensure normal functioning of their institutions. Tosun and Abizadeh (2005) define taxes as one of the instruments of fiscal policy while Tabansi (2001) asserts that taxation is the system of imposing levy by the government against the income and profit or wealth of the individual, partnership, and corporations. German businessman Wilhelm Siemens is credited with coming up with the idea of VAT while the Maurice Laure has built into a system who was the joint director of the French tax authorities (Charlet, Owens, 2010, p. 943).

## 2. Literature review

There are many studies about VAT. Shenk and Oldman (2007) emphasize in their research that France was the first country who implemented VAT for the first time in the world by 1954. Value Added Tax is a widely accepted indirect taxation system around the world and it has been implemented in more than 150 countries (Brown & Gale, 2012). Many VAT system can be described as having a basic rate and special rates for some goods and services and also exemption status for certain economic activities and specific goods and services (Kamruddin, M 2012). Many researchers (Bird, 2005; Charlet and Buydens, 2012; Keen, 2013; Onwuchekwa, Aruwa., 2014) analyzed definition of VAT where it presents one of indirect tax that applied on consumption of goods and services and it's to be charged on the value of imports and on value added on goods and services supplied by one business to another while it reaches to final consumers. Ebrill et al (2001) noticed that VAT is a good way to raise resources and modernize the overall tax system while Jalata (2004) researched that indirect tax is a more significant instrument for the poorest economies to boost domestic revenues on goods and services. Grinberg (2009) calculated that VAT revenues are estimated to account for almost 20% of the total world's tax income. In the case of Romania, the studies on the VAT emphasize the importance of the conditions under which a VAT is fully optimal where an efficient tax structure requires the development of the VAT and income taxes (Pantazi and Straoanu, 2011, Keen, 2008, Zee, 2008). Bikas and Rashkauskas (2011) analyzed the effect of VAT standard tariff, reduced tariffs and shadow economy on income from this tax using multiple regression, correlation, and optimization and C-effectiveness ratio analysis. Also, it included Lithuanian VAT structure, the dynamics of income from this tax and amendments in the Law on VAT where their results showed that amendments in the Law on VAT in terms of widening and narrowing the taxable base has influenced the amount of income from VAT.

Bearing in mind that the paper highlights the effects of VAT on economic growth, authors are focused on many studies which were conducted on the contributions of VAT for the economic growth by using GDP as macro-level indicator (Unegbu and Ireferin, 2011; Wawire 2011; Adereti, et al 2011; Hakim and Bujang 2011; Alemu 2011; Owolabi 2011, Worlu and Nkoro 2012; Stoilova and Patonov, 2012; Izedonmi and Okunbor, 2014; Chigbu, Ali, 2014, Kaczynska, 2015). Zimmermannova et al. (2016) analyzed the relationship between gross domestic product and unemployment and regional tax revenues such as value-added tax and income tax in the Czech Republic. They concluded a statistically significant positive relationship between observed variables.

### 3. VAT implementation in Serbia

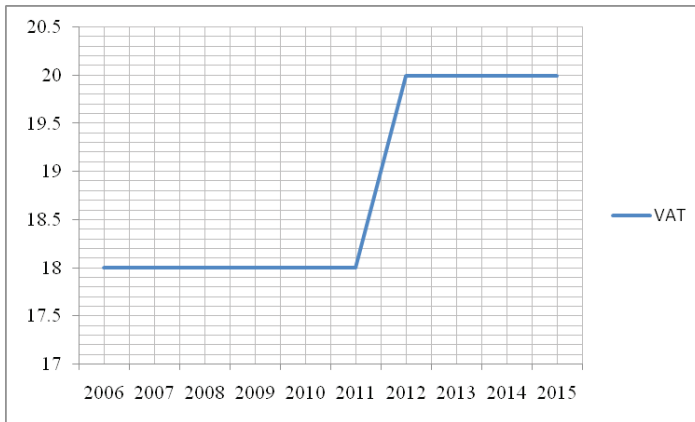
Value Added Tax has been introduced in Serbia as of 1 January 2005 and has replaced sales tax. Serbia VAT law applies the destination principle to cross-border transactions where VAT registration threshold amounts to RSD 8 million.

**Table 1. Type of Vat rates in Serbia**

Vat rates	
Standard rate	20%
Reduced rate	10% applies to supplies of basic foodstuff, listed drugs, daily newspapers, gas, hotel services, etc.
Zero rate	Export of goods; transportation and other services in direct relation to export, transit or temporary import of goods; entry goods in free zones and transportation and other services in relation to the entry of goods into the free zone, services performed on movables obtained by a foreign user of the service in Serbia or imported for the purpose of inward processing, repairing or incorporating and then exporting, etc.

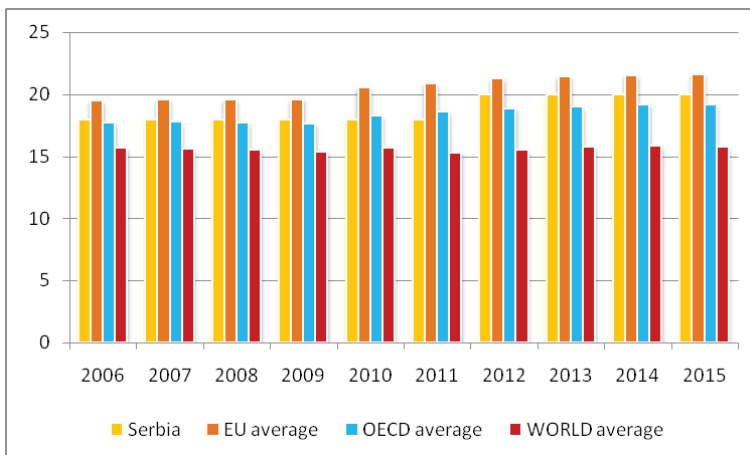
*Source:* Serbian Tax Card (2015) [https://www.kpmg.com/RS/en/services/Tax/Documents/KPMG\\_SerbianTaxCard\\_2015\\_WEB.PDF](https://www.kpmg.com/RS/en/services/Tax/Documents/KPMG_SerbianTaxCard_2015_WEB.PDF)

The term exempt supplies include supplies of goods and services that are not subject to VAT: properties (except for the first-time transfer of ownership), financial and insurance services, rental of flats if used for housing, postal services, education and religious services, printing and sale of publications etc. In the following two figures, we can see movement of rates (standard) VAT in Serbia and it should be noted that the standard rate of VAT was moved 2012 year at 18% to 20% which is the actual rate in a current year.

**Figure 1. Standard VAT rate in Serbia from 2006 to 2015**

Source: Authors based on [www.kpmg.com](http://www.kpmg.com)

Figure 1 shows a trend of standard VAT rate in Serbia in the period from 2006 to the 2015 year in Serbia. When this tax is introduced, the level of VAT was 18% whereby there were no changes to 2012 while the rate was increased by 2%, respectively to 20%.

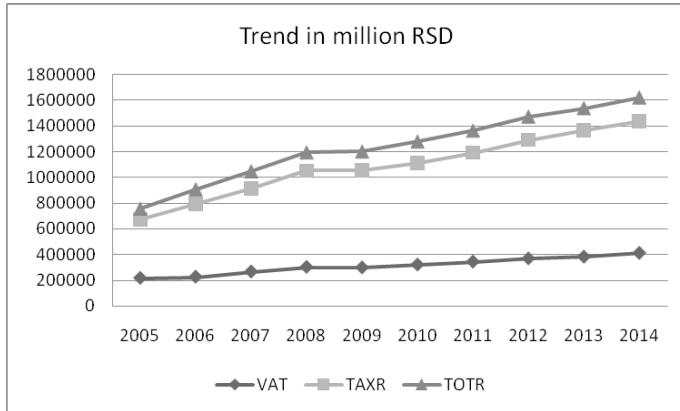
**Figure 2. Standard VAT rate in Serbia and EU, OECD, and World average**

Source: Authors based on [www.kpmg.com](http://www.kpmg.com)

Looking at the standard rate of VAT in Serbia, it's at the level of 20% which is 2% higher than the original rate after being introduced. In order to compare the height and level of this tax form in Serbia, it's included the average rate of VAT in the EU countries. In the period 2005-2010, the VAT rate was lower by 1.5% - 2.5% of the average VAT rate in the EU. Although Serbia has been increased a rate of 18% to 20%, it's still below the EU average. Also, it is higher than average rate in OECD countries and the world average rate which is moving at a level above 15.5%. Specifically, in 2015, the average

rate in OECD countries was 19.15% that is lower by 0.85% compared to the rate of VAT in Serbia while the average VAT rate in the world amounted to 15.78%.

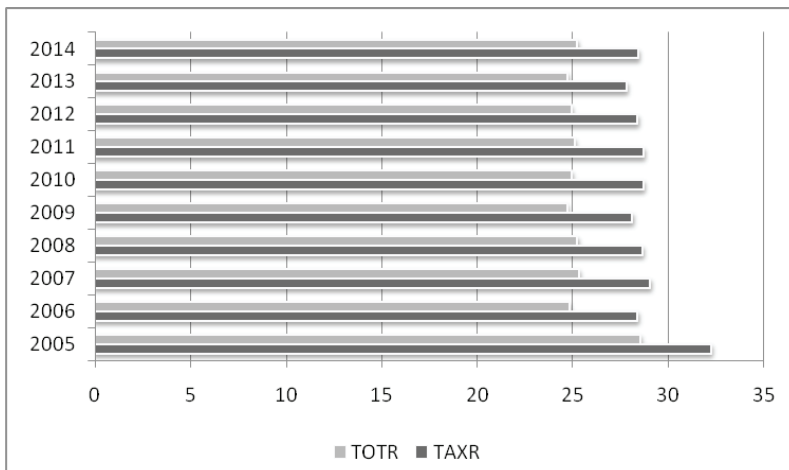
**Figure 3. Trend of revenues in Serbia (in mill RSD)**



Source: Authors based on www.mfin.gov.rs

There is a growing trend of total revenues, tax revenues, and revenues based on VAT in the ten-year observed period. First, VAT revenues grew by an average of 7.5% while the highest growth was recorded in 2008 and 2008 when they had double rate growth of 17% and 13%. On the other hand, the average growth of TAXR was 9.01% whereas the growth was very intense and exceeded 15% from 2007 to 2009. TOTR have recorded similar trend where average growth is 8.09% in analyzed period.

**Figure 4. VAT share in tax revenues and total revenues %**



Source: Authors calculation

Figure 4 reflects the share of VAT in TAXR and TOTR from 2005 to 2014. Looking this indicator, it's noticeable that value-added tax amounts almost a third of tax revenues and a quarter of total revenue. Precisely, at the beginning of the observed period, the highest share of VAT is noticed of 32.27 per cent of TAXR and 28.57 percent of TOTR which is greater for almost 4 percent compared to the end of 2014.

### 3. Methodology and results

This study aims to determine the impact of value added tax on the gross domestic product, tax revenues and total revenues of Serbia and find out the relationship between values of observed variables. Authors used annual data which were extracted from Ministry of finance reports from 2006 to 2015. In order to determine the contributions of Value Added Tax (VAT) to economic growth (GDP), Tax Revenue (TAXR) and Total Revenue (TOTR), we have determined models:

$$\text{LOGGDP}_t = a + b \text{Log Vat}_t + e_t \quad (1)$$

GDP is used as the dependent variable with VAT as the independent variable.

$$\text{LOGTAXR}_t = a + b \text{Log Vat}_t + u_t \quad (2)$$

Tax revenue is the dependent variable with VAT as independent variable.

$$\text{LOGTOTR}_t = a + b \text{LogVAT}_t + i_t \quad (3)$$

Total revenue is the dependent variable with VAT as independent variable.

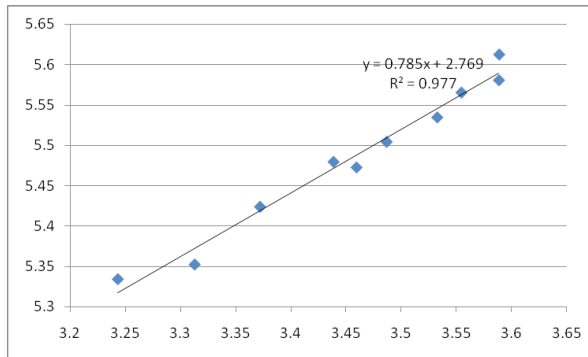
**Table 2. Descriptive statistics of observed variables**

VARIABLE	MEAN	MEDIAN	STANDARD DEVIATION	MINIMUM	MAXIMUM	KURTOSIS	SKEWNESS
LOGGDP	3.457659666	3.473053132	0.117699417	3.243286146	3.588607805	-0.572905806	-0.655810892
LOGVAT	5.486017392	5.491926117	0.093505414	5.334467825	5.612321776	-0.80265054	-0.445568174
LOGTAXR	6.025682648	6.034494583	0.10556695	5.825667542	6.158071961	-0.136131287	-0.697316201
LOGTOTR	6.08177	6.093071	0.104832	5.878514	6.209717	-0.02457	-0.78372

*Source:* Authors calculation

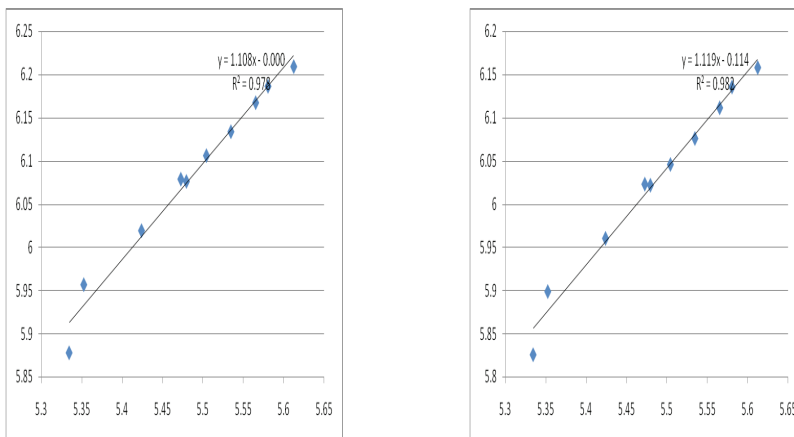
Table 2 manifests analysis of logarithms value of GDP, VAT, TAXR and TOTR in the period from 2005 to the 2014 year in Serbia using descriptive statistics tools like a mean, median, standard deviation, minimum and maximum, Kurtosis and Skewness test. In this period, LOGGDP has an average value of 3.4576 with a standard deviation of 0.1177 where the minimum value of 3.2432 and the maximum value of 3.5886.

Next, LOGVAT has recorded an average of 5.4860 with a standard deviation of 0.0933 while the minimum and maximum values are 5.3345 and 5.6123. Other indicators LOGTAXR and LOGTOTR have average values of 6.0255 and 6.0817 while the levels of minimum are 4.8256 and 5.8785. The standard deviations of these two indicators are 0.1055 and 0.1048 while the maximum values are 6.1580 and 6.2097. If it looks at testing based on Kurtosis and Skewness, the coefficients of asymmetry are smaller than 0 and reflect a slight negative asymmetric distribution of logarithmic values of analyzed indicators and higher frequency of above average levels while negative values indicate that the curve is flattened. Next, it used correlation analysis to examine the relationship between variables VAT, GDP, TAXR, and TOTR.

**Figure 5. Correlation between VAT and GDP**

Source: Authors calculation

Based on Figure 5, the coefficient of determination of estimated relation between VAT and GDP in the period from 2005 to the 2014 year for the Serbia is 0.9888 which meaning that 99% of the variations is observed by the model, respectively of the variations logarithms of VAT. The correlation coefficient is 0.9778 which reflects a very strong and positive linear relation between the logarithms value of VAT and GDP. Based on the value of  $p=0.05$  it manifested that value of VAT not significantly affects the value of GDP.

**Figure 6. Correlation between VAT and TAXR and TOTR**

Source: Authors calculation

The next figure reflects two relationships in the same observed period in Serbia so what are included two additional variables as tax revenues (TAXR) and total revenues (TOTR) compared to value added tax (VAT). Both graphs show strong and positively correlation between observed variables where the value of the coefficient is at the level of 98% while the coefficient of determination is at the level of 99%. On the other hand, this strong and positively correlation isn't significant based on the value of  $p=0.05$



## Conclusion

Every country looks for ways to increase their revenues and this facilitated many economies to introduce VAT on goods and services. Authors researched the effect of VAT on the economic growth of Serbia. Based on the study, VAT doesn't significantly impact on GDP, TAXR, and TOTR while the relationship between observed variables is strong and positively. First, the coefficient of correlation between VAT and GDP is 0.9778 which reflects their high and strong positive relationship. Further, if it includes variables TAXR and TOTR in relation to VAT, it can notice a simple correlation compared to the previous coefficient where the first correlation is 0.9827 while the second correlation is 0.9780 measured by the used coefficient. These results are significant and give a certain importance because almost 99% of the variations is explained by the model, respectively of the variations logarithms of VAT. The contribution of this paper is reflected in exploring a topic that isn't sufficiently researched in Serbia and there aren't many studies that analyzed this topic in Serbia. The future study can consider the same research topic with the analogous country as a comparative study and enhance the knowledge in the field.

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## THE ROLE OF THE ACTIVE POLICY OF THE LABOR MARKET IN THE REPUBLIC OF SERBIA

### Abstract

*By joining the labor market, each individual acquires economic and working independence. The therefore, dealing with the issue of unemployment is one of the key topics. For the economy of one country the efficient functioning of the labor market represents a precondition for a successful implementation of structural reforms and even economic growth and development. The policy of the labor market is a sector policy which affects the labor market. It consists of the labor market could be described as one of the most important policies of the labor market. In the paper the author presents the role of the measures of the active policy of the labor market, tendencies and effects of the implementation of the measures of the active policy. Using the sources of the National Employment Service on the measures, programs, users and allocations for the active policy of the labor market, the author presents the role and results that the active policy of the labor market has in our country. The aim of the paper is to define the guidelines for a better harmonization of the supply and demand in the labor market by monitoring the implementation of the measures of the labor market.*

**Key words:** the labor market, unemployment, the active policy of the labor market.

**JEL classification:** J21, J6, J 680

## УЛОГА АКТИВНЕ ПОЛИТИКЕ ТРЖИШТА РАДА У РЕПУБЛИЦИ СРБИЈИ

### Апстракт

*Кроз укључивање на тржиште рада сваки појединац стиче економску и радну самосталност тако да је решавање проблема незапослености једно од водећих питања. За привреду једне земље ефикасно деловање тржишта рада је предуслов успешног спровођења структурних реформи и равномерног привредног раста и развоја. Политика тржишта рада је секторска политика којом се делује на тржиште рада. Она се састоји од законодавства, активне политике тржишта рада и пасивне политике тржишта рада. Активна политика тржишта рада се може издвајати као једна од најбитнијих политика тржишта рада. У раду се приказује улога мера активне политике тржишта рада, тенденције и ефекти спровођења мера активне политике.*

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*Полазећи од извора Националне службе за запошљавање о мерама, програмима, корисницима и издвајањима за активну политику тржишта рада приказује се коју улогу и резултате има активна политика тржишта рада у нашој земљи. Циљ рада је да се кроз праћење спровођења мера тржишта рада дефинишу смернице за боље усклађивање понуде и тражње на овом тржишту.*

**Кључне речи:** *тржиште рада, незапосленост, активна политика тржишта рада.*

## Introduction

The policy of employment includes all aspects of economic policy which influence the usage of the working environment directly or indirectly. The policy of employment includes fiscal policy, monetary policy, the policy of salaries, the policy of external trade, the policy of foreign exchange course (Aradarenko, 2013). The joint part of the policy of employment is the policy of labor market. Its aim should be increasing the labor market trade by setting the balance between the offer and the search for the working force. The important growth of the unemployment among the countries which are in the transition made many countries getting the special programs of employment based on the concepts of (Active Labor Market Policies - ALMP). One of the aims of such policy is to make (un)employed more flexible compared to the request of the labor market and to give them the opportunity for improving their chances in order to find or keep their labors (Larsen, 2005).

ALMP supports creating the employment on two ways:

- Directly, by opening new working positions (public works, opening companies, subventions for the employment of new workers)
- Indirectly, by improving the employment (practice, training, efficient labor exchanges that provide better information of the labor market) (Lekovic & Marjanovic, 2011).

In the OECD report from 1993, active policies of the labor market are formed in three groups, the first one relating to the mobilizing of the work force offer, and growth of the labor seeking (subvention creating of the new labors and micro-credit schemes, public works, subvention earnings), then the group of active measures that directly contribute to the knowledge improvement and the improvement of the labor market participants (the training programs for the unemployed, especially of the elderly people and of those who are under the risk of unemployment) and intercession in the aim of employment, connecting the offer and demand in the ALPM (OECD, 1993a).

The aim of this work is to show ALMP and their role fighting the employment, with special attention on the role of active labor market policy in the Republic of Serbia. The work consists of four parts. In the first part - the importance and the development of ALMP are shown. In the second part we deal with the theoretical and empirical consideration of this area. In the third part we deal with the institutional frameworks of ALMP trade market in Serbia. There are also analysis of the active measures trough its example of the national action plan. The works end on the basic conclusions.

## Theoretical and empirical approach to the active measures

The countries which first introduced the active measures are: Sweden, Norway, Denmark, Germany, The Netherlands and Belgium (Larsen, 2005; Mailand, 2005), and later that approach slowly spread in other European countries. This approach of employment became the constitutional part of the employment policy of European union in 1990s (European commission, 1993). Because of the growing unemployment – the concept of active participation on the labor market becomes one of the common priorities (Ballester, 2005; Schomann, 1995).

When we talk about achieving balance in the labor market it is necessary to point out, from the above, the Danish model of flexibility in the active employment policy, the so-called model “golden triangle” (Madsen, 2005). The goal of this model is to promote employment opportunities rather than job security ie. permanent employment. The first side of the “golden triangle” are flexible rules of employment, where employers facilitate dismissal in recession. About 25% of workers in the Danish private sector change job each year. At the same time (the other side of the triangle) there is a generous provision for unemployment in the amount of 90% of the minimum wage. The third side of the triangle is ALMP, effective system to help the unemployed. Denmark spends about 1.5% of GDP to ALPM (The official website of Denmark, 2017), while the amount in Serbia is about 0.1% of GDP (NSZ, 2016).

The theoretical concept of implementation of ALPM is presented by the “Beveridge curve”. This graphical representation explains the relationship between unemployment and the job vacancy rate. The curve has a hyperbolic shape and slopes are downwards explaining that the higher unemployment rate comes with a smaller number of vacancies. The curve is dynamic, ie. for the given level of vacancies the growth of unemployment is expected, which implies the inefficiency of the labor market. Thus, the labor market is inefficient because it does not adequately perform the pairing process between job vacancies and inactive workforce. The following analysis show the displacement in the “Beveridge curve”: OECD (1993b); Katz (1994); Calmfors (1994).

It is necessary to highlight that the empirical studies mainly deal with the problems of ALMP on the labor market in the specific countries and that the extensive comparative studies are rare. Evaluation of active measures has demanding methodology. At the same time we must take into account the specificity of the country in which the assessment is conducted involving the questions of the level of economic development, labor market trends and the influence of state regulation in the labor market (Zubović, 2011). Also, it is necessary to consider a longer period of time in order not to get over-estimated effects results. Further more, it is necessary to take into account whether intervention is justified or not, the concept of evaluation methods (macro approach or mikro-evaluation) and the effects of active measures.

It is necessary to highlight that the empirical studies mainly deal with the problems of ALMP on the labor market in the specific countries and that the extensive comparative studies are rare. Summary results of the evaluation of active measures is given in Bono (2010); Boeri & Ours (2008); Caliendo (2006); Betcherman and others (2004, 1999) for developed countries. The evaluations that deal with problems ALPM in transition countries are: Ognjenovic (2011); Bonin & Rinne (2006); Betcherman, Olivas & Dar (2004); Spevachek (2009), Lehman & Kluve (2010), and many others. The last mentioned study (Lehmann & Kluve, 2010) shows that there is a positive impact of active measures, given the relative level of expenditure for ALPM in relation to GDP, to the reduce of the unemployment rate. The other studies that examine the relation between the unemployment rate and expenses for the active measures are (Katz, 1994; Calmfors,



1994; Martin 2000; OECD 1993c; etc). The study of Forslund et al. (2011) concluded that, depending on the phase in the economic cycle, different programs have different effects. In the period of recession programs training the most influence on the shortening of the time to find work. One of the elements that adversely affect the effects of the application of active measures are national employment services that in most transition countries, including Serbia, are not sufficiently effective when it comes to implementing active policies. The reason for this is the limited number of advisers who work directly with persons in need of assistance in employment. (Kuddo, 2009).

### **Institutional framework of the active policy on the labor market of the Republic of Serbia**

Nowadays Serbia is in the situation which many transitional countries of Eastern and South – East Europe have passed or are still passing through. The rate of unemployment lags behind the Lisbon's aim (employment from 70 %), and the rate of unemployment, based on the official information, shows that each fifth able-bodied citizen is unemployed. In accordance with it, one of the consequences of transitional movements is strengthening the public interventions on the labor market. Apart from the passive measures which are continually being done, in 2005. started intensive usage of active measures.

Serbia actively started implementing the labor market policy through giving higher importance of the active measures. In 2005. the National strategy of employment was adapted for the period 2005-2010. Three main principles based on the new national strategy of employment from 2011. to 2020 are: increasing the employment, investing in the human capital and social inclusion (Ministry of Economic and Regional Development, 2010). New strategy also follows the priorities of the European strategy- Europe 2020 in the field of employment (European commission, 2010). Actually the European strategy in the field of employment intrudes three integrated guidelines that refer to: the growth of the participation on the labor market and decrease of structural unemployment, the development of the qualified work force as a response to for the needs of the labor market, promoting the quality of life and endless learning, improving the performance of the education system and increasing the participation of tertiary education, as well as promoting social involvement and dealing with the poverty.

Business contractors of employment at the labor market in the Republic of Serbia are the National Employment Service (as the public service) and the Employment Agency (which are involved in the law system from 2003). The surveillance over the work of National Employment Service is done by the Ministry of Economic and Regional Development. Employment agencies can be founded by legal and physical person.

Ascertaining the work of the National Employment Service and following the efficiency of implementation of ALPM from the action plan is determining by the agreement of performance concluded by the Minister competent for the labor hiring and the director from the National Employment Service. National Employment Service gives the quarterly, half yearly and yearly reports about the work to the Minister and those reports are then forwarded to the Government. Also, the Ministry sends to the Government yearly report about the conduction of the action plan, at least till April 30, for the previous year.

In Serbia, the Law on Employment and Unemployment Insurance provides that the monitoring and evaluation of the effects of ALPM is a set of activities aimed at monitoring the implementation of plans, programs and measures of ALPM, intensifying developments of the labor market, in order to create conditions for undertaking measures aimed at its improvement (Aksentijević, 2011).

## Active employment measures in the Republic of Serbia

ALPM are aimed at improving the employment, carried out by the National Employment Service, and they are:

1. *Mediation in employment of labor seekers* is organized to accelerate the process of connecting employers and the unemployed. These include: consultation focused on the selection of appropriate labors, developing skills of active labor search, establishing contacts with employers and satisfying expressed needs, selection and deployment of the unemployed person to the employer for employment or other work opportunities, organizing trade fairs etc.
2. *Vocational guidance and counseling on career planning* is done through: information and advice about the opportunities for career development; psychological assessment for the purposes of employment, participation in programs of additional education and training and entrepreneurship programs; training self-efficacy, workshops for coping with stress caused by labor loss, psychological support workshops for career planning (for potential redundancies), the organization of trade fairs for professional orientation, participation in other events related to career planning and so on. These measures are associated with lower cost compared to other active measures and contribute to shortening the period of unemployment. National Employment Service provides training through donor projects in cooperation with the Ministry in charge of employment.
3. *Employment subsidies* for new job creation are granted to employers in the private sector in a lump sum. Employers who belong to the private sector, especially SME's, can have subsidies for employing on new jobs employees who are in hardly employ category. Subsidy is paid to the employer as a lump sum, but the end-users of subsidies is unemployed persons who are employed through this measure. The unemployed who obtain work place with this measure, are simply replacing those who would be employed in a case this measures don't exists. The positive effects of this ALPM are diminished by the lost of those on whose place came the participants in the program, so there is a “dead” effect and effect of substitution. However, it offers the advantage for vulnerable young people to gain work experience, stay in touch with the labor market (Corbanese & Gianni, 2009). To neutralize the negative effects, it is important to reshape the program.
4. *Support for self-employment* is the resources and technical assistance that can achieve the unemployed who is in process of self-employment. Self-employment is the establishment of shops, cooperatives, agricultural farms or the other forms of entrepreneurship of the unemployed, as well as the establishment of a company if it's based founder starts self-employment relationship. Promotion of self-employment involves two steps. First, counseling about what self-employing is, and what is needed to lead the business. The second step envisages the provision of package of measures to support training for entrepreneurship, business plan, financial support. Unemployed people can receive state grants (subsidies) to start their own business. The subsidy paid by the National Employment Service is the same for the whole country, and some local governments can have their own subsidy programs. Condition for receiving subsidies for self-employment is to carry out training of the National Employment Service (and other institutions) and write a business plan.
5. *Further education and training programs* provide an opportunity to the unemployed through the process of theoretical and practical training to acquire new knowledge and skills for employment or self-employment.



Further education and training are organized by the National Service Agency or at the request of the employer or for the needs of the labor market. Training programs can be related to the increase in the willingness to work or to acquire specific skills. Training and retraining are directed primarily toward certain groups, as follows: long-term unemployed and young people.

6. *Incentives for users of pecuniary* for unemployed persons and the user of financial compensation for unemployment insurance gets for at least three months from the moment of recognition of the rights and enter into employment for an indefinite period which shall be entitled to one-time stimulus for employment in the amount of 30% of the total amount of money, benefits without contributions for compulsory social insurance, which would have been paid for the time remaining until the expiration of the right to financial compensation.
7. *Public works* as active programs are being implemented since 2006. Public works of interest for the Republic can be organized and implemented in cooperation with the territorial autonomy and local self-government, based on the contract, which defines the methods and sources of funding. Public works are carrying out in the social, humanitarian, cultural activities, maintenance of public infrastructure, maintenance and protection of the environment and nature. Public works programs are primarily designed to support the less employable, long-term unemployed people in underdeveloped areas. The Government can implement these projects independently or in cooperation with the private sector and local government. Public works conducts an employer – contractor on the basis of a public competition. The cost of public works are: salaries of unemployed persons, reimbursement of expenses for traveling to and from work, reimbursement of cost of public works and charges of organizing training. Effects of public works are positive, but lacking long-term effects on employment.
8. *ALPM for persons with disabilities*, in order to encourage employment and measures, are implemented in accordance with the Law on professional rehabilitation and employment of persons with disabilities.
9. *The co-financing* programs of active labor market provided by local employment action plans (LEAP) from the state budget at the request of the autonomous region or a local authority. Autonomous region, or local government, can through the National Employment Service submitte a requirements for participation in the financing of programs of active labor market measures provided for LEAP.
10. *Packages of services* for unemployed persons who have priority for inclusion in ALPM indicate a need to intensify activities in order to improve position category of less employable persons, particularly young people, older and redundant workers, persons with no qualifications or low-skilled, long-term unemployed and people with disabilities (National action plan for 2007).

## Conclusion

In terms of economic restructuring and adjustment to the needs of modern business, the burden of change are distributed unevenly. Most affected are less educated, young people without work experience and long-term unemployed. Well-designed, targeted and comprehensive programs of ALPM could contribute to a faster, easier and better inclusion of the unemployed into the labor market. Application ALPM is not sufficient in itself to

increase employment, but need support of adequate industrial macroeconomic policies that attract investment, create and support the demand for profit. In the absence of a favorable macroeconomic environment, which will result in increased investment, economic growth and employment, ALPM can provide only temporary support to the unemployed.

Evaluation of the effects of ALPM should be an integral part of the planning in employment and education policy. Systematic approach should be implemented for the evaluation and application of ALPM in the Republic of Serbia. Only through a comprehensive analysis is possible to evaluate which measures successfully achieved its goal, which of them should be adjusted and improved, and which to discard. Allocation for ALPM in Serbia lag behind allocation of developed countries, while in comparison with countries in transition, structure of expenditures for ALPM is worse. In addition, it is important how these funds are spent and is it purposefully (OECD, 2016). It is also necessary to increase the volume of financial resources making the selection of potential participants to ALPM had a greater effect on employment, choose adequate measures, reinforce national employment services.

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## STRATEGIC ADJUSTMENT OF THE COMPANY CHANGES

### Abstract

*Strategic planning, because of its emphasis on the future, implies extreme subjectivity in the development and assessment of a variety of objectives and strategies. The influence of personal values and priorities of the strategic planning is not limited to personal values and priorities of the company managers, but also other employees and the customers. Personal values and priorities, internal or external, carry with them certain advantages and disadvantages. In some cases they improve strategic planning by creating a differential advantage in the marketplace or in the costs. In contrast, they can sometimes limit the goals and strategies of the company. The company must continuously assess potential trends in personal values and priorities, and on the basis of this assessment to develop variants of the strategic plans of potential changes, taking into account the possible reactions to the same competition.*

*The plan allows the company to better prepare for possible changes in the environment, and the development of strategic variants prepare their business for any events before they actually do occur.*

**Key words:** *strategic planning, strategic management, company, plan and strategy.*

**JEL classification:** *L52, P41, M11*

## СТРАТЕГИЈСКО ПРИЛАГОЂАВАЊЕ ПРЕДУЗЕЋА ПРОМЕНАМА

### Апстракт

*Стратегијско планирање, због свог нагласка на будућности, подразумева изузетну субјективност у развоју и оцени разних циљева и стратегија. Утицај личних вредности и приоритета на стратегијско планирање није ограничен само на личне вредности и приоритете руководиоца предузећа,*

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*већ и осталих запослених, као и самих клијената. Личне вредности и приоритети, унутрашње или спољашње, носе са собом и одређене предности и недостатке. У неким случајевима они побољшавају стратешко планирање тако што стварају диференцијалну предност на тржишту или у трошковима. Насупрот томе, некада могу ограничити циљеве и стратегије предузећа. Предузеће мора перманентно процењивати потенцијалне трендове у личним вредностима и приоритетима, и на бази те оцене развијати варијанте стратешких планова потенцијалних промена, водећи рачуна о могућим реакцијама конкуренције на исте.*

*План предузећу омогућава да се што боље припреми за могуће промене у окружењу, и да развијањем стратешких варијанти припреми своје пословање за евентуалне догађаје пре него што до њих заправо и дође.*

**Кључне речи:** *стратешко планирање, стратешки менаџмент, предузеће, план и стратегија*

## Introduction

Management as a permanent action on the basis of decisions made planning company strives not only to adapt, but also to actively influence the conditions in which it carries out its business activity. Planning company seeks to eliminate the adverse impacts on their business activity. Although a number of factors affecting the company beyond its control, without planning the events with which the company is facing would be left to the case - a concurrence of circumstances with a positive or negative outcome for the company. Experience teaches us that a number of events would not have occurred at all if it were not planning activities of the company. Planning means that the company is in a dilemma whether to leave him water events in the future or that seeks to create or at least influence on their future consciously defines the different alternatives. A company that plans ready for the changes, while a company that does not plan permanent unsuccessfully resolved “unforeseen problems”. Planning means thinking systematically about the future of the company, with the emphasis that it creates in the present action. Planning is creating change rather than preserving the status. This activity is for something to happen that otherwise no action planned would not happen. Planning is a continual process of making planning decisions to make changes in the relationship between the company and the environment. Planning allows the company to expand its attention outside the markets in which it performs its business activity at present.

Planning is a good approach to the time and space. The time horizon is a time limit on a predictable share of the unpredictable future. Long-term planning does not mean the same interval for all companies.

Belief in the planning is based on the assumption that it increases control of the future and the ability to react to events that can not be controlled. The dilemma is planned or being planned. The intended business objectives will not be achieved if it fails to take appropriate action, and if it is likely to take positive outcomes povećava. Ukoliko the company wants to have some control over events, it must be planned. If the activity is not planned defense company must react to events in the middle. Planning company may

seek to reduce the impact of changes to his position in the middle, to reduce delays in response and, finally, as must act to reduce the costs of response.

Although planning is future-oriented, it allows you to support the current reality of the decision, based on which the action is undertaken immediately. It allows to assess the decisions “mature” to be made today, and that it is better to postpone for tomorrow. The current decision is based on planned objectives. This reduces the ability to create a crisis situation for which they found a partial solution, but it is not possible to avoid negative consequences for the enterprise mobility.

## Strategic planning

Strategic planning is necessary due to changes in the environment which in various ways affect the performance of the company. Very often changes affect the structure of the industry that requires strategic reaction. Strategic planning allows the company to face the so-called. “Future shock” which is described as a disease of people and organizations that the future beyond, before being ready for it. “Future Shock” occurs when the tip speed of change and developments beyond the individual’s ability to adapt. The necessity of strategic planning stems from the fundamental difference between passive and active response to changes in the environment, or between passive and active adjustments. Before making business decisions to initiate an active adjustment, it should be established whether these are operational, competitive or strategic changes in the middle. On the operational changes to respond by adjusting the volume of activity. In the competitive changes respond planned actions that lead to change the position of companies in the structure of the branches. On the strategic changes are responding by changing markets, technology and capacity of the company. Today, literature is treated as strategic planning framework for innovation, and as a stimulus for new products, technological processes and markets. Strategic thinking is needed is not to be taken aback effects of changes in the macro and micro environment. The problems arise when the company changes in the environment are not accompanied by customizing company adequately.

Changes in the environment can be basically positive for the company or inadequate response management can lead to a deepening mismatch between resources companies and require protection. It’s in a good number of cases means that invent new relationships between assets and expertise of companies and require protection.

In strategic planning, the company faces very complex problems that can not be solved or can be somewhat simplified. They have a number of causes, it is difficult to describe, there is no right answer. Solutions to these problems are not real and false, but good or bad. There is no direct or final test for this kind of problem. Any such problem is unique. The difficulty is that planners have no right to make mistakes. Those who solve this kind of problem are responsible for the consequences, because the stocks have a large impact on the company. Nevertheless, strategic planning is the right answer for this kind of problem. Strategic plans should be “living” documents which change according to the needs of enterprises, should create scenarios and strive to achieve the future they want.

All shares of individual competitors in the industry are focused on the use of ways of gaining competitive advantage. The effectiveness of certain actions depends on the phase of the life cycle of the branch, as well as the reaction of other companies in the



industry. Superior profitability assumes a high perceived value and / or lower costs than competitors in its delivery. One must know when it is more emphasis on perceived value, and when the lower costs.

The purpose of strategic planning is to achieve superiority over competing companies. Superiority should exist in relation to consumers, in the way of meeting their needs and to deliver superior value. The causes of superiority over the competition should look for the roots of the advantages and superior expertise and superior resources. To root advantages have resulted in a better strategic position in the market, management must have the ability to effectively and efficiently use superior expertise and superior resources. Strategic plan companies expressed direction for the future, the objective of performance and strategy. A merging of strategic vision, goals and strategies in the strategic plan.

The effectiveness of strategic planning now predominantly depends on the level of development of the strategic management of the company. Strategic planning contributes to the creation of strategic options and the choice of optimal strategy. Strategic management involves thinking, decision making and action to create competitive advantages. The concept of strategic management allows a rational approach is not only more strategic planning and realization of transformation processes in the company.

Strategic management involves three areas of activity: strategic analysis, strategic choice and strategic change. Strategic planning gives its full contribution to the strategic analysis and strategic choice. These are areas of activity covered by the sector planning in modern enterprises.

According to Drucker strategic planning, analytical thinking and preparing resources for allocation. He emphasizes that strategic planning does not deal with future decisions over the future of present decisions. The problem is that the future should be incorporated into the current thinking and action, that period should be considered and how to use the information that at present make rational decisions. For him, the real strategic plans are leading to immediate action, seeking new and better ways to achieve the objectives of the business. Strategic planning is preparing the current business for the future. Its purpose is to direct action. He points to the three essential attributes of strategic planning. The first is its orientation to basic questions the effectiveness of the company, such as the selection of the right business area. Another important attribute of strategic planning is its orientation to change the strategic position of the company. The third attribute is oriented to the growth and development of the domestic and international markets.

***The relative value of strategic planning is measured by its contribution:***

1. precise identification of strengths and weaknesses of the company;
2. identifying existing and potential advantages over other participants in business operations;
3. risk assessment of certain alternative courses of action, and
4. assess the internal consistency of the elements of the Strategy.

Strategic planning contributes to avoid the mistake that the allocation of origin do before you formulate strategies, and to formulate strategies and allocation of resources is performed spontaneously. Finally, strategic planning is a creative approach to the planning process that focuses on the future of present decisions.

In strategic planning should make a distinction between the decisions that have the character of policy and strategy. Privacy (attitudes, concepts, principles or criteria) shall be taken to ensure the routing decision (making daily decisions) toward the goals. Decisions that have the character of policies ensuring consistency, economy and unique solving current problems that arise in business. They are the focus of decision-making that occur in business and which can be largely programmed. The strategy is a way to achieve the goals and objective of each new strategy seeks to achieve. These are decisions that are not structured and that can not be programmed.

A distinction is made between one-way and two-way learning. At DC learning or model of organizational learning that begins with a plan that, like any plan, seldom fully realized. Usually that is based on monitoring of the execution plan, and adjusted as new implements. This continues the trials and errors, corrections and adjustments. The DC cycle learns how to better implement the existing plan. Does not leave enough room to open itself into question. The focus is how to effectively implement a plan that you've implemented the real operation. Sooner or later, every company has to move towards strategic learning cycle, in which the focus is changing from "how" to "what", ie the emphasis on the efficiency of the emphasis on efficiency. Strategic cycle involves reflecting operational performance as required by developments in the external environment. Connection between the external environment and internal organizational processes, enables management to create new business vision and priorities. New approaches are then included in the operational processes in the next operating cycle. Then two-way learning happens in the strategic and operational cycle. Working only at the strategic level, without involving the learning back to the operating cycle, is a one-way learning at the strategic level. Similarly, working only on an operational level without being able to observe whether the current operation still valid for the environment, is a one-way learning at the operational level. Transformation goes further and asks what is the purpose of the action? It links the operational and strategic levels of learning.

Long ago has argued that planning is a learning enterprise planning institutional learning. Indicates that the weight of institutional learning from individual learning. Effective individual learning is a prerequisite for the success of the company. The reason is that significant changes resulting from learning about the companies themselves and their environment. In fact, the normal decision-making process in the company is a learning process, because people change their mental models and create common models as they talk. Learn faster than competitors may be the only way to strengthen competitive advantage.

When both markets, both product and origin, turbulent and disruptive, competitive advantage must be constantly renewed. Businesses can do so only if you manage your knowledge. Therefore, it is necessary to use two means of strategic planning - planning scenarios and internal strategic analysis - to create a plan and integrate knowledge to achieve a sustainable competitive advantage in the hypercompetitive markets.

How external market-oriented, and internally-oriented company can provide focus and create a strategic plan to guide business action. But with this it is necessary to employ the organizational knowledge management prepared to use the advantages of developing the competitiveness of the market. There is no essence of competence does not give the company a competitive advantage because they can copy, replace and make irrelevant.

Companies can gain competitive advantage in the hypercompetitive markets, developing organizational knowledge through strategic planning. It enables both the



structure and context for the development of such knowledge that is sustainable and renewable source of competitive advantage.

Strategic planning is a process that identifies the gap between existing and required skills, contributing to the company becomes a learning organization, which creates conditions for superior performance.

### **Strategic analysis**

Most authors define analysis environment as the process of monitoring the state and changes in it to set up signals for the opportunities and risks that may affect the company's ability to achieve its business objectives. There is an opinion that the analysis of the middle has three purposes. The first contribution to enterprise policy and improve the management of information on developments in the middle, that would be well defined basic strategic questions. Another role is to help the integrated strategic planning or providing information needed by managers at both companies, and the level of SPJ to improve the overall quality of the planning and coordination of special management and the SPJ. The third role is to help the business functions that help functional managers at the company level and possibly SPJ, if any in the company, the changes that have a major impact on the results of individual business functions.

Critical information for the assessment of the current strategic position of the company are about to get on to market share, the relative growth rates of companies and markets and whether the competitive position improves or worsens. On the basis of such information it is possible to estimate the power of strategic positions of companies and to assess whether it will be in the foreseeable future to improve or deteriorate. The emphasis in monitoring changes in the middle should be on those changes that have a high probability event and a great influence on the company.

The economic analysis should determine whether the structural changes in the environment or in part. Partly reflect the important indicators in a given structure, a structural point to qualitative changes in the relations between enterprises and the environment. Economic analysis can include all levels (global, regional, national, and local) or only one of them. Changes to the higher level have implications for the lower levels. Economic analysis is a reliable information base for the analysis of sensitivity to changes in companies, or answer questions “what if?” What is important to identify market opportunities and alternative approaches to their use.

### **The effectiveness of strategic planning**

Managers should use planning as an essential mechanism in dealing with the instability of the environment. Of course, as the situation becomes more complex, it is planning more complex. It is understandable that emphasize innovation and adaptation. It is essential to balancing the four dimensions of planning: symbolic, rational, transactional and generative. In large companies a bigger role than a symbolic planning at companies of other dimensions. Expressed instability requires more emphasis on generative planning. Assessment of future markets is an important prerequisite for timely adjustment to changes in the enterprise environment.

Strategic planning should be introduced taking into account the culture of the company, in an effort to reflect employees as strategic thinkers. Strategic thinkers are people who have already shown that they can think beyond today. This does not mean that only strategic thinkers participate in the process of strategic planning because the teams need people whose competence in understanding everyday tasks at the operational level. The realization of the relationship between operational considerations and strategic considerations is a critical element in the successful implementation of strategic planning.

Looking at the performance of people rather than businesses in relation to the strategy, suggests a new concept of “champions of strategic planning.” This applies to practitioners involved in the strategy. These are practitioners who introduce, promote and guide the process of strategic planning in the company. It is believed that there are three roles that the champion has to do to perform traditional tasks competently and technical expert. The three roles are: development of social relations, a good interpreter of the famous alien. Champion is an expert in strategic thinking, which has specific technical and analytical skills. This helps to enable you to master the traditional roles of strategic and analytical thinker planners.

### **Strategic control companies**

Strategic control deals with the success rate to achieve the basic strategic direction of the company, in terms of its relationship with the environment. Strategic control relies on information from several sources, but it is a greater reliance on information from external sources. Often it comes to assessing planning assumptions underlying the strategic plans. The focus of the analysis of the information on which it is possible to answer the questions: whether the company choose the right business areas, whether in them moving in the right direction and whether it works effectively.

Strategic control has a directional character due to the time lag between the initiated application of the chosen strategic options and the final results of the actions taken. The focus of the strategic control in several important areas, which can be a source of risk. The assumption of strategic control performance is good to identify the critical success factors of companies in formulating strategic plans.

***It is believed that there are three styles of management in diversified businesses:***

1. Strategic Planning,
2. Strategic control and
3. financial control.

### **Conclusion**

Successful strategic planning is a kind of bridge between the company and its environment. Bridging the perceived obstacles and establishes the shortest connection to the target markets.

The system of strategic planning arises from the need for strategic management thinking. Performs the analysis and assessment of the competitive situation and to analyze branch (s) in which the enterprise conducts its business activity. Performs the

dynamic allocation of resources based on their potential to create value. Predict new trends and phenomena of discontinuities in the economy. Management is increasingly focused on new product - market. The emphasis is increasingly placed in the research and development activity of the company. Greater attention is paid to the study of consumers and competition. The company is oriented to the domestic and international markets as a source of ideas and scope of business activities.

A larger number of authors tell the difference between long-term and strategic planning in the future observation. In long-term planning is believed to be to predict the future by extrapolating the historical growth of the company. Management believes that the performance in the future will be better than in the past. The strategic planning is not expected that the future will certainly be better than the past, nor does it believe that the past can be extrapolated into the future. In strategic planning replaces extrapolation strategic analysis (internal and external) to establish the strengths and weaknesses as well as opportunities and threats for the company.

The Company generates, its business plans, the mission in cooperation with internal and external factors. Management is the one who has to understand and predict the scope of opportunities and threats that are in the environment and taking into account the strengths and weaknesses of the company determine the way of business. The development environment is changing and management company. If a company combination of financial, material and human resources, and realizes maximize business objectives, then the launch and implementation of its activities depends on the circuit entrepreneurs, leaders and managers whose successful cooperation between the company achieves its mission. For the emergence, survival and successful business operations are important: capital, innovation and risk-taking, business ideas, and the ability to get through the planning, organization, management and control in managing the process of production.

The company is constantly faced with the opportunities that he indicated in an environment even though they are often masked the problems. At the company or the management company is that they identify, predict and determine their size and ability to adapt to changing *stregijsko* companies.

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## ENVIRONMENTAL IMPACT OF TRADE, ENDANGERMENT AND PROTECTION OF CULTURAL PROPERTY

### Abstract

In this paper we will discuss the problem of trade's impact on the environment, protection and threats to the cultural property. Man and all the other living beings are mutually related with the entire inanimate and living nature that surrounds them from the beginning of their existence. This interaction of man-living environment is the basis of the whole modern law of environmental protection. With each new discovery (starting with the tools needed for working the land and the invention of the wheel all the way to the modern computer technology) man fulfills an increasing part of the eternal desire to reconcile his needs and nature.

In developing this work, we noticed the problem: "what is the impact that the trade has on the environment?".

Today, every citizen of the planet Earth is worried about environmental pollution because the consequences of it are seen daily, through the air we breathe, the water and the food that we consume and through pollution and radiation that we are exposed to, also the consequences of environmental problems are manifested through the shortage of natural resources, extinction of plant and animal species, and disturbance of the global ecosystem and biogeochemical processes.

**Keywords:** environment, trade, cultural property, human, environmental problem, ecosystems.

**JEL Classification:** Q5, Q50, Q56

## УТИЦАЈ ТРГОВИНЕ НА ЖИВОТНУ СРЕДИНУ, УГРОЖАВАЊЕ И ЗАШТИТА КУЛТУРНИХ ДОБАРА

### Апстракт

У овом раду пишемо о проблемима утицаја трговине на животну средину и на угрожавање и заштитити културних добара. Човек и сва друга жива бића од почетка свог постојања везани су тесном узајамном везом са целокупном неживом и живом природом која га окружује. Управо та интеракција човек–животно окружење, тј. животна средина представља основ читавог савременог права заштите животне средине. Са сваким новим проналаском (почев од оруђа за обраду земље и точка, па све до савремене компјутерске технологије) човек остварује све већи део вечите жеље да усклади природу и своје потребе.

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Приликом израде овог рада учили смо проблем: “колики утицај има трговина на животну средину?”.

Данас је сваки становник планете Земље забринут за загађење животне средине. Са последицама загађења се сусреће свакодневно, кроз ваздух који удише, водом и храном коју уноси у свој организам, кроз загађења и зрачења којима је изложен. Последице еколошких проблема манифестују се кроз све мању количину природних ресурса, изумирање биљних и животињских врста, и поремећаје у глобалном екосистему и биогеохемијском процесу.

**Кључне речи:** животна средина, трговина, културна добра, човек, еколошки проблем, екосистеми.

## Introduction

Most economists believe that the expansion of trade generally brings benefits, promoting increased efficiency and increases wealth of the countries that participate in it. But what if the expansion of trade harms the environment? At the national level, the standard economic policy response to the impact on the environment is to implement policies that internalize extreme hardship over nature. At the international level, however, the picture is not so clear.

The issue of relations between trade and environment has launched the expansion of world trade. The question is, whether the trade is good or bad for the environment? The answer is not so obvious. Production of goods for import and export, as well as other production, affects the nature and the environment. With the expansion of trade, the question remains whether these effects will increase or decrease? How will this affect the exporting country, the importing country or the world at large? Who is held responsible to solve the environmental problems associated with the trade? Such issues attracted increasing attention in recent years.

## Impact of trade on the environment

“International attention was first focused on these issues in 1991, when the Mexican government protested against the American act prohibiting the import of tuna from Mexico. The Marine mammal protection act prohibited the methods for catching tuna that endangers and kill a large number of dolphins and also prohibited import of tuna from countries that are using similar fishing methods. The Mexican government said that this act violates the rules of the International Agreement on Tariffs and Trade (GATT - the General Agreement on Tariffs and Trade).” (Ćulahović, 2009, 135).

States cannot prohibit the import, except in special cases such as the protection of the health and safety of their citizens, according to the principles of free trade, which provided the basis for the establishment of GATT and the World Trade Organization (WTO - World Trade Organization). The GATT council concluded that the United States cannot use national legislation to protect dolphins outside their own territorial boundaries.

“Although Mexico did not insist on the implementation of this decision, the case of tuna and dolphins launched a major controversy on issues of trade and environment. A similar situation happened in 1999 when the World Trade Organization ruled that

the United States cannot prohibit the import of shrimp from countries that use fishing methods that kill endangered sea turtles. (Ćulahović, 2009, 136).

The implications of this and the previous decisions of tuna and dolphin case could affect many other international environmental issues and questions, including forest protection, ozone depletion, hazardous waste and global climate change. All these questions are related to the international trade. If individual countries can use trade measures to protect the global environment, is it possible to come up with effective policies to answer these questions? In order to know the answer, we need to examine the theory and practice of international trade.

“Developed countries are the ones that currently have the biggest impact on the environment due to their high demand for resources per capita, as well as for pollution. If developed countries fail to raise the standard of living for their increasing population – as China and other countries in East Asia have succeeded in doing so – that will increase their demand for food and resources per capita, but will increase and create more pollution also.” (Savić, Terezija, 2002, 113).

### **Endangerment and protection of biodiversity**

„For several decades, pollution and environmental protection represent a very important problem for humanity, regardless of the current level of development of society and of the productive forces in some parts of our planet. Science is imposed by the existing actual problem, and more clearly we come to the conclusion that a healthy environment is no longer in large areas, that many elements are threatened, that the degree of self-regulation of certain assets is no longer known, and that once disturbed ecological relationships can never be brought to their original state.” (Skenderović, Kalač & Bećirović, 2014, 107).

Biodiversity includes the entirety of genes, species and ecosystems on Earth, therefore, it represents the diversity of life on Earth.

Today biodiversity is threatened because of the loss of natural habitats, environmental pollution and climate change. All of these are consequences of human actions. Man keeps cutting down forests, drying up ponds and swamps to get agricultural land and facilities for his estates. The construction of roads on the natural habitats destroys them and thus prevents migration of organisms.

With its activities man pollutes water, air and land. Excessive hunting, fishing, collecting plants and introducing new species into ecosystems are directly threatening the survival of living beings.

“For biodiversity to be saved, the most important thing is to have in mind the current situation. Scientists with their research data come to the knowledge which species and areas are threatened and they are trying to find the factors of vulnerability.” (Ćulahović, 2009, 135).

The subject of particular interest is the so-called “hot spot” areas (focal points or hot spots) or areas which are the centers of biodiversity and at the same time are under anthropogenic influence. In our country and in our region, hot spots are identified as: Šar Mountain, Durmitor, Prokletije, Skadar Lake, Lake Ohrid, part of the Adriatic coast etc.

Based on these researches, new plan for their protection is created. First, certain species and areas need to be protected by law and then we need to carry out the activities for their protection.



“In our country there are laws that regulate the protection of biodiversity. Also, our country is a signatory to various global documents related to the protection of biodiversity. We will mention only a few: the Convention on Biological Diversity United Nations, the Convention on International Trade in Endangered wild fauna and flora, the Ramsar Convention on the conservation of wetlands and others. “ (Ćulahović, 2009, 137).

Environmental protection activities, areas and species and their implementation involve the application of law. In addition to the natural environment, protection of species is carried out at the botanical and zoological gardens also, where the endangered species are kept and bred.

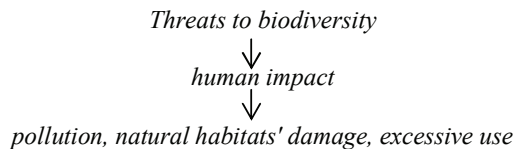
The botanical garden “Jevremovac” keeps endangered plants as the unique European forsythia, where scientists use different techniques for reproduction of it.

Also, in the laboratories, they are using different methods (e.g. tissue culture) trying to reproduce endangered species. The aim is to propagate the endangered species and return them to their natural habitats.

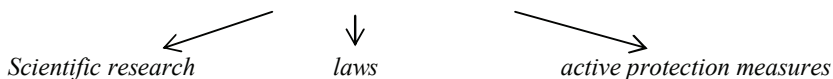
“Using the techniques of reduced plowing, hanging gardens, soil rest and plantation forestry (planting trees in cultivated fields and around them helps to reduce the erosion. Integrated pest management is carried out with the natural control of pests such as natural predators, rotation of crops grown and the removal of pests in the early stage thanks to human effort in order to the use the minimum of chemical pesticides. “ (Miljković, 2002, 60).

In addition to all the measures mentioned above, it is extremely important that when people develop the so-called environmental awareness, to act with awareness, according to the importance of biodiversity conservation and protection of nature.

## ENDANGERMENT OF BIODIVERSITY



## PROTECTION OF BIODIVERSITY



“This simplified diagram illustrates the essence of the problem. Since the damage is associated with accumulations, and not with the emission, impact on the environment is gradually becoming more and more serious and continues for many years after the control measures have been taken. Taking measures against cumulative pollutants requires urgent action and harsh policy. Even with such measures taken irreversible damage may occur. In our opinion, for the accumulation in the environment, many decades will need to pass and then, sixty years after, they may begin to decline at the safe level. “ (Miljković, 2002, 68).

„To protect the natural habitats and species living in it, certain areas are being declared as natural resources. Natural resource is a well protected area, characterized by cultural and historical values where human activities, which could endanger it, are prohibited.

By the act of protection and the surface they occupy, natural habitats in our country are classified into the following categories: national parks, nature parks, areas of outstanding features, nature reserves, special nature reserves, natural monuments, protected natural habitats and natural rarities (wild species).” (Ćulahović, 2009, 211).

National park represents a large area of a great natural, cultural and historical significance with preserved ecosystems. There are a lot of national parks with great biological diversity, such as: Fruška Gora, Đerdap, Tara, Kopaonik.

Dužans’ legal code from XIV century witnesses that of importance to protect the nature in Serbia is often thought about. The code defines the prohibition of excessive deforestation in Serbia

Fruška Gora is known for its well-preserved deciduous forests of sessile oak and preserved parts of steppe vegetation. In addition to the diversity of plant life, it is distinctive for its historical values also. There lives rare and endangered species – colorful salamander and viper – the only venomous snake in Fruška gora. The presence of a great number of birds of prey such as: eagle, booted eagle, saker falcon, black kite, Levant sparrow-hawk, buzzard and others is especially important.

Until now, in Fruška gora is registered more than 400 species of mushrooms.

“The neighboring Romania just as Serbia declared Đerdap as a national park in 1974. The main natural phenomenon of this area is the grandiose Đerdap gorge, through which flows the Danube River. Flora of Đerdap is characterized by diversity (over 1100 species) and a distinct relict character (hazel, hackberry, walnut, lilac, silver linden, montpellier maple). In this area you can encounter a bear, lynx, wolf, jackal, white-tailed eagle, black stork etc. With the construction of hydropower plant Đerdap, variety of not only plant species but also animal species has been changed, which endangered their survival in this area. For example, the river Dunav in Đerdap is not as rich as it was with the rare fish species such as beluga and sturgeon as they cannot pass through the dam due to the lack of fish ladders and lifts on it.” (Ćulahović, 2009, 225).

Tara was declared a national park in 1981. It is mainly the space of forest ecosystems, mixed forest primarily, spruce, fir and beech. It is important to point out that in this area unique forest of endemic and relict species appears - Serbian spruce. In addition to Serbian spruce important species are: turkish hazel, yew, European holly, Dafne blagayana, Derventa knapweed, peony and fern. 53 species of mammals are living here (brown bear, chamois, etc.). Of the 135 species of birds, particularly stand out the most endangered species such as eagle, falcon and other natures cleaners. In the forests of Tara grows more than 251 species of fungi, some of which are lethally poisonous.

“Kopaonik was declared a national park in 1981. It includes a mountain range in the central part of Serbia. It has evident vertical zoning of vegetation. The highest forest belt, over 1500 meters above sea level, is covered by dense forests of spruce. At higher altitudes (1750-1900m) spruce forests become less thick and there starts the community of low shrubs (juniper, blueberry). Three stenoendemic plant species exist on the territory of NP Kopaonik, which means that they can

only grow here and nowhere else, not in any other place in the world. These are, Кopaоникс' houseleek, Кopaоникс' violet and Cardamine pancicii. There are 30 protected species and some of them are: golden eagle, peregrine falcon, tawny owl, wild cat and live-lizard. “ (Ćulahović, 2009, 226).

Areas with preserved or slightly modified natural environment are special nature reserves. They usually express one or several elements of nature. Thus, for example, in botanical reserves, rare or endemic plant species can be found, and different valuable species in the forest communities also. Zoological reserves, which have a rich bird world or rare species of fish, are declared the ornithological or ichthyological reserves. Some of the well known are: Koviljski rit, ancient complex Bergej-Imperial pond, Obed Swamp and Zasavica.

Natural or partly cultivated vast areas with special environmental, educational and tourist values are the nature parks. Some of nature parks are: Old Mountain, Ludaš lake, Sićevač Gorge, Vršac mountains etc.

Devil's Town is a natural monument located in the heart of the mountain Radan, in southern Serbia. This is an erosive expansion, which makes more than 200 earthen pyramids, towers and steeples. These pyramids are the height of 2-15m and width of 3-5m. The whole complex is extraordinary, and it has scientific, educational and cultural significance. “ (Ćulahović, 2009, 227).

Certain natural resources being protected at the national level, could be protected at the international level also, under the protection of the UNESCO programme MAN and BIOSPHERE (MAB) is a space Golije with Studenica - nature park and biosphere reserve. In Serbia, 9 humid areas, marshes and wetlands, according to the Convention on the protection of wetland areas (Ramsar, 1971) designated as internationally important. In particular, Obeds' swamp is known for its beauty and various biodiversity. This area has many different species of birds as: spoonbill, stork, blue-duck, white-tailed eagles and many other species.

The special nature reserve is a protected natural asset of a great importance. It is located in southwest Serbia. This reserve is distinguished by the presence of 104 different species of birds. The most important ones are the griffon vulture, one of the two vulture species, which are now nesting in Serbia. Griffon vulture is a vulture species, with a wingspan of up to 3 meters. The role of these birds in the food chain of an ecosystem is unique and irreplaceable. They only feed on dead animals, thus preventing the spread of infection and in this way “natural recycling” is performed.

### **Endangerment and protection of cultural property**

“With the development of civilization and culture various creations of spiritual and material character were created. They are called cultural goods. They can have artistic, historical, scientific and technical character. Cultural goods are proof of identity and origin of the people, and therefore their conservation is of a great importance. Cultural goods of one country are called cultural heritage. “ (Miljković, 2002, 88).

Some cultural goods can be of a wider world value, and they are part of the UNESCO World Heritage List. Cultural heritage is divided into movable and immovable cultural heritage.

“The movable cultural heritage includes: books, archival documents, artistic and historical objects that can be found in museums, various natural history collections, archaeological sites, movies and so on.” (Miljković, 2002, 88).

“The immovable cultural heritage includes: various buildings, archaeological sites, parts of villages, etc. Buildings and monuments which by their architecture, artistic value and the historical significance are important for the country and the nation are called cultural monuments. Serbia has about 200 important cultural monuments.” (Miljković, 2002, 89).

On the list of world cultural heritage are 11 of the Serbian cultural monuments. These are: Monastery Studenica, Monastery Sopoćani, Monastery Đorđevi stupovi, the remains of the city Rasa, Church of St. Peter, the archaeological site Gamzigrad, Decani Monastery, The Patriarchate of Pec, Gračanica Monastery and the church of Our Lady of Ljeviš.

Cultural goods can be compromised in many ways. They can be threatened by natural disasters, wars, conflagration, impacts of climate and precipitation (acid rain), the impact of micro-organisms, as well as negligence and human carelessness.

A damaged cultural monument must be rebuilt (restored), and then preserved - protected from negative external influences. Movable cultural heritage must be kept in adequate conditions.

Protection of Cultural Property aims to preserve cultural heritage for future generations.

### CULTURAL HERITAGE

- MOVABLE

-IMMOVABLE

\* *the national cultural heritage*

\* *the world cultural heritage*

\* **UNESCO's list**

**ENDANGERMENT**

*natural disasters, wars, conflagration, acid rain, negligence*

**PROTECTION**

*laws, restauration, conservation*

### Conclusion

The man and his doings made a considerable impact on the natural ecosystems. Cities, roads, farms, rivers with bridges and river stopped by dams, open pit mines and quarries - all this is a part of human civilization, which affects natural ecosystems. Changes to natural and artificial ecosystem formation, leading to land degradation, pollution of water and air.

However, man in modern society realized that nature needs to be protected, restored and environment to be improved.

Ecosystem restoration means the return of the structure and species to the condition before the damage to the ecosystem was done, and the recovery of all natural processes to their previous state. Improvement of the environment means improving the structure of the habitat to species that are best adapted to the conditions of the ecosystem.

Natural regeneration of some ecosystems has been slow. Such is the case with the forest ecosystems. In these situations human activity is essential. Regeneration is done by planting appropriate plant species, so-called afforestation. This prevents soil erosion, moisture loss, creating the conditions within which the ecosystem can be restored.

The process of improving and restoring natural ecosystems includes reintroduction. Reintroduction is the process of returning native species to localities from which they have disappeared.

Options to improve the environment are particularly evident in urban ecosystems. By planting parks, lawns, rows of trees inside the village, man is preserving its environment and creates better living conditions. Besides the improvement of living conditions in the city, this also means conservation in the use of natural resources and the installation of air purifiers and waste water is also implied. In order to improve urban ecosystems in a timely manner, it is important to develop environmental awareness of all citizens.

Europe is a highly urbanized continent today. More than 70% of the population live in cities. Caring for life in the city and the preservation of the natural balance is best reflected in the example of Berlin - one of the purest and the cleanest cities of Europe.

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## WASTE MANAGEMENT WORKFORCE COST ANALYSIS IN SERBIA FROM 2009 TO 2015<sup>3</sup>

### Abstract

*Waste management entails business expenses during the performance of waste management activities. The bulk of these expenses comprise workforce costs, costs of amortization, energy, tools and equipment, etc. The aim of this paper is to analyze the workforce cost in waste management in Serbia from 2009 to 2015 using statistical data analysis. The results show a constant increase in the total gross and net waste management workforce costs. The gross waste management workforce cost increased by 70.5 % during the analyzed period, while the net cost in the same category increased by as much as 72.75 %.*

**Key words:** workforce cost, waste management, Serbia

**JEL classification:** Q5

## АНАЛИЗА ТРОШКОВА РАДНЕ СНАГЕ У ДЕЛАТНОСТИ УПРАВЉАЊА ОТПАДОМ У СРБИЈИ У ПЕРИОДУ ОД 2009. ДО 2015. ГОДИНЕ

### Апстракт

*Управљање отпадом проузрокује пословне расходе који настају у току рада, односно обављања делатности. Највећи део ових трошкова представљају трошкови радне снаге, амортизације, енергије, средстава и опреме за рад и др. Циљ овог рада је сагледавање трошкова радне снаге за управљање отпадом у Републици Србији у периоду од 2009. до 2015. године применом методе статистичке анализе података. Резултати показују константно повећање укупних бруто и нето трошкова радне снаге за управљање отпадом. У анализираном периоду, бруто трошкови радне снаге за управљање отпадом, повећали су се за 70,5 %, док су се нето трошкови радне снаге за управљање отпадом повећали за чак 72,75 %.*

**Кључне речи:** трошкови радне снаге, управљање отпадом, Србија

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## Introduction

Waste management is directly involved in environmental protection, but it also has a high socio-economic significance. That is why good waste management practice is often called sustainable waste management. “In market economies, waste is presented as a potential resource, an ever-growing secondary raw material with a positive exchange value” (Vujić & Brunner, 2009, p. 44). Thus, the real value of waste is determined. Nevertheless, “proper waste management from the moment of generation, through collection, transport, treatment, all the way to final disposal prevents diseases and epidemics, minimizes the possibility of injury, protects the environment, and provides room for more productive activities, which collectively constitutes the hidden value of waste” (Vranjanac, 2015, p. 67). Certain costs are incurred during all of the said stages of waste management, but the aim of this paper is to analyze the costs of waste management workforce in Serbia. “Entire families in developing countries such as Serbia make their living from collecting and selling secondary raw materials” (Brunner & Fellner, 2007, p. 234). Yet, “this is not a systematic approach, since the hygiene requirements are much more demanding, which is observable through indicators and standards” (Pejčić, Vranjanac, Bakota, Namura, 2015, pp. 82-89).

## Waste Management Activity

In the Republic of Serbia, activities are classified according to the:

- Law on the Classification of Activities (“Official Gazette of the Republic of Serbia”, No. 104/09),
- Act on the Classification of Activities (“Official Gazette of the Republic of Serbia”, No. 54/10), and
- Act on the Methodology for Classifying Classification Units According to Activity Classification (“Official Gazette of the Republic of Serbia”, No. 54/10).

According to the *Act on the Classification of Activities*, waste management comprises:

- waste collection,
- waste treatment and disposal, and
- reuse of materials.

*Collection of non-hazardous waste* comprises:

- collection of non-hazardous solid from local territory, such as collection of municipal and commercial waste into mobile waste containers, which can yield a combination of reusable materials,
- collection of recyclable materials,
- waste collection from public surfaces,
- construction waste collection,
- collection and removal of debris such as twigs or gravel,
- textile waste collection,
- activities at transfer stations for non-hazardous waste.



*Collection of hazardous waste* comprises:

- collection of solids and non-solids, e.g. explosive, oxidizing, flammable, toxic, irritating, carcinogenic, corrosive, infectious, and other substances and agents hazardous to human health and the environment,
- identification, processing, packaging, and labelling of waste for transport,
- collection of hazardous waste, such as: used motor oils, biohazardous waste, nuclear waste, used batteries, and
- activities at transfer stations for hazardous waste.

*Waste treatment and disposal* involves disposal and pre-disposal treatment for different waste types and in different ways, such as organic waste treatment for disposal, treatment and disposal of dead animals and other contaminated waste; treatment and disposal of hospital radioactive waste, waste unloading on the ground or into water, burial or ploughing in of the remains; disposal of used goods such as refrigerators in order to eliminate harmful waste; disposal of waste formed by incineration or combustion. This has the added benefit of obtaining energy through incineration. “*Treatment and disposal of non-hazardous waste* involves disposal and treatment prior to the disposal of solid and non-hazardous non-solid waste” (Theisen, Vigil, Tchobanoglous, 2012, p. 212):

- operation of non-hazardous waste landfills,
- disposal of non-hazardous waste by incineration or other methods, with or without further use of electric or steam energy, compost, fuel substitutes, biogas, ash, or other products, and
- treatment of organic waste for disposal.

“*Treatment and disposal of hazardous waste* involves disposal and pre-disposal treatment of solid and non-solid hazardous waste, including waste that is explosive, oxidizing, flammable, toxic, irritating, carcinogenic, corrosive, and infectious, and other substances and agents hazardous to human health and the environment” (Inglezakis & Moustakas, 2015, 310). It comprises:

- operation of hazardous waste treatment facility,
- treatment and disposal of dead animals and other contaminated waste,
- incineration of hazardous waste,
- disposal of used goods (e.g. refrigerators), from which harmful materials are subsequently removed,
- treatment, disposal, and storage of radioactive nuclear waste including: treatment and disposal of hospital radioactive waste, encapsulation, preparation, or other types of nuclear waste treatment for storage purposes.

*Reuse of materials* involves:

- wreck dismantling and
- reuse of sorted materials.

*Wreck dismantling* involves the dismantling of any type of wreck (cars, ships, computers, TV sets, and other devices) for reuse. *Reuse of sorted materials* involves the processing of metal and non-metal waste, scrap, and remains into secondary raw materials, usually through physical or chemical transformation processes. It also involves reuse of materials from waste flows in the form of:



- 1) separation and sorting of reusable materials from non-hazardous waste flows or
- 2) separation and sorting of reusable mixed waste, such as paper, plastics, used cans and metals into different categories.

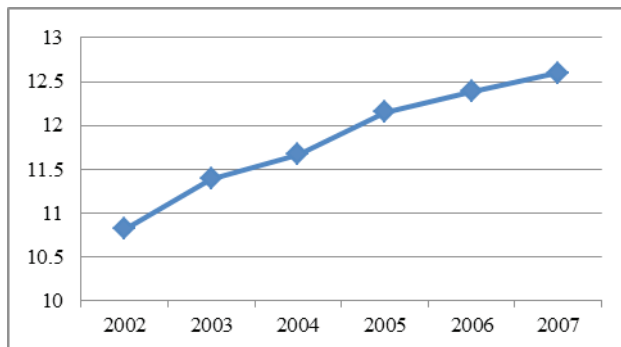
### Waste management personnel

According to the *Law on Waste Management* (“Official Gazette of the Republic of Serbia”, No. 36/09), waste management is a public interest activity, involving the implementation of prescribed measures for waste handling within collection, storage, treatment, and disposal stages, including supervision of these activities and maintenance of waste management facilities after closure. “The process of waste management requires a specific number of qualified employees, from engineers, who deal with public utility activities and who are specialized in this field, to waste management technicians and operators, who perform tasks associated with waste collection, treatment, and disposal” (Vranjanac, 2015, p. 78). The number of employees involved in the *removal of refuse, litter, and other waste* in Serbia from 2002 to 2007 is shown in Table 1 and Figure 1.

*Table 1: Number of employees involved in the removal of refuse, litter, and other waste in Serbia from 2002 to 2007*  
(Source: *Statistical Yearbook of Serbia, 2003-2008*)

Year	Number of employees	Index
2002	10,816	100.00
2003	11,388	105.29
2004	11,669	108.16
2005	12,153	112.36
2006	12,388	114.53
2007	12,596	116.45

Based on these data, it can be concluded that the number of employees in waste removal increased annually. Throughout the period, the number of employees increased by 16.45%, from 10,816 in 2002 to 12,569 in 2007.



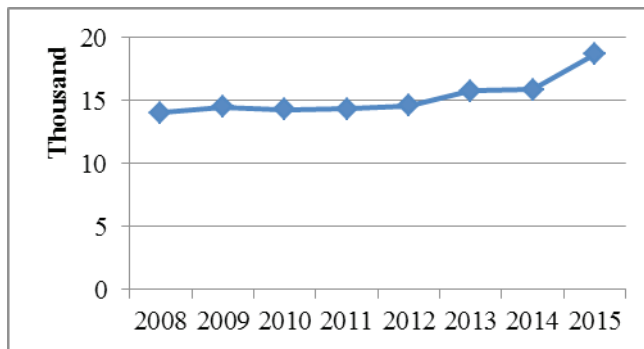
*Figure 1: Number of employees involved in the removal of refuse, litter, and other waste in Serbia from 2002 to 2007 (in thousands)*

Since the activity *removal of refuse, litter, and other waste* was transformed into *waste collection, treatment, and disposal* in 2008, the number of employees for the newly-named activity in Serbia from 2008 to 2015 is shown in Table 2 and Figure 2.

*Table 2: Number of employees involved in waste collection, treatment, and disposal in Serbia from 2008 to 2015*  
(Source: *Statistical Yearbook of Serbia, 2010-2016*)

Year	Number of employees	Index
2008	14,030	100.00
2009	14,505	103.39
2010	14,285	101.82
2011	14,370	102.42
2012	14,615	104.16
2013	15,786	112.52
2014	15,867	113.09
2015	18,695	133.25

The data reveal that the number of employees in the analyzed eight-year period increased by 33.25%, from 14,030 in 2008 to 18,695 in 2015.



*Figure 2: Number of employees involved in waste collection, treatment, and disposal in Serbia from 2008 to 2015 (in thousands)*

### Calculation of waste management workforce cost

The cost of the workforce hired for waste management in Serbia is expressed through their gross or net income. “The following formula is used for calculating the workforce cost expressed through gross income earned ( $TRS_{bz}$ )” (Spasić, 2003, p. 108):

$$TRS_{bz} = Z \times PBZ$$

where:

Z – number of employees and

PBZ – average gross income.

“The following formula is used for calculating the workforce cost expressed through net income earned ( $TRS_{nz}$ )” (Spasić, 2003, p. 108):

$$TRS_{nz} = Z \times PNZ$$

where:

Z – number of employees and

PNZ – average net income.

## Results and discussion

The data on the number of employees, average gross and net incomes, and workforce cost for waste management in Serbia from 2009 to 2015 are shown in Table 3 and Figure 3.

*Table 3: Number of employees, average gross and net incomes, and workforce cost for waste management in Serbia from 2009 to 2015 (in dinars)  
(Source: Statistical Yearbook of Serbia, 2010-2016)*

Year	Number of employees	Avg. gross income per employee	Avg. net income per employee	Gross workforce cost	Net workforce cost
2009	14,505	40,642	29,126	589,512.21	422,472.63
2010	14,285	42,882	30,813	612,569.37	440,163.70
2011	14,370	46,988	33,906	675,217.56	487,229.22
2012	14,615	50,806	36,601	742,529.69	534,923.61
2013	15,786	52,825	38,178	833,895.45	602,677.91
2014	15,867	54,283	39,292	861,308.36	623,446.16
2015	18,695	53,761	39,038	1,005,062.89	729,815.41
Total	108,123	-	-	5,320,094.64	3,840,728.64
Annual average	15,446	48,883.86	35,279.14	760,013.52	548,675.52

The total gross workforce cost for waste management from 2009 to 2015 was 5,320,094.64 dinars, whereas the total net workforce cost for the same field was 3,840,728.64 dinars. These costs were incurred over the seven-year period by 108,123 employees, i.e. 15,446 employees per year.

The average gross income in waste management from 2009 to 2015 was 48,883.86 dinars per employee, whereas the net income was 35,279.14 dinars per employee. The average gross annual income in waste management in Serbia was 760,013.52 dinars and the average net annual income was 548,675.52 dinars.

During the analyzed period, the gross workforce cost increased by 415,550.68 dinars. Similarly, the net workforce cost increased by 308,342.78 dinars. According to these data, the cost of hired waste management workforce in Serbia increased significantly over the analyzed period. The results show a constant increase in the total gross and net waste management workforce costs. It can be stated that they are growing from year to year without decrease.

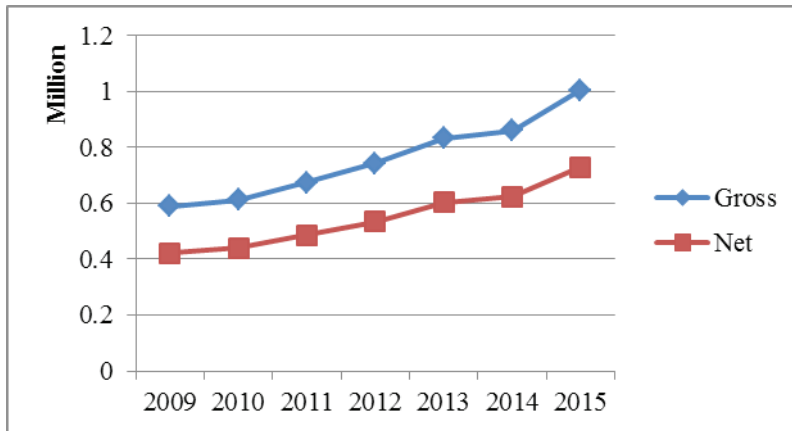


Figure 3: Gross and net waste management workforce cost in Serbia from 2009 to 2015 (in million dinars)

## Conclusion

In order to avoid the negative impact of waste on the environment and human health, waste has to be managed. Waste management activity in Serbia is of particular importance for environmental protection, while it represents a developing field from an economic perspective. This is confirmed by the data analyzed in this paper, pertaining to workforce costs for waste management in Serbia from 2009 to 2015.

The waste management workforce comprises engineers, technicians, operators, and administrative and support staff, whose work incurs certain expenses. In this paper, workforce costs were calculated as a product of the number of employees and their average gross or net received income.

Ever since the activity *removal of refuse, litter, and other waste* was transformed into *waste collection, treatment, and disposal* in 2008, the number of employees over the analyzed seven-year period increased by 28.29%, from 14,505 in 2009 to 18,695 in 2015.

The gross workforce cost of waste management increased by 70.5%, from 589,512.21 dinars in 2009 to 1,005,062.89 dinars in 2015. The net workforce cost increased by as much as 72.75%, from 422,472.63 dinars in 2009 to 729,815.41 dinars in 2015. The difference between the gross and the net received incomes over the analyzed period amounts to 1,479,366.00 dinars, which is the amount of money from waste management that went into the state budget.

According to these data, it was to be expected that the workforce cost would only increase each year, so the amount of money going into the budget of the Republic of Serbia would also increase. In addition to these economic benefits, hiring more workers in waste management implies a more favourable attitude towards the environment and people's health and wellbeing, which in turn contributes to the implementation of sustainable development goals.

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## ШАБЛОН / ТЕМПЛАТЕ ЗА ПИСАЊЕ РАДОВА

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