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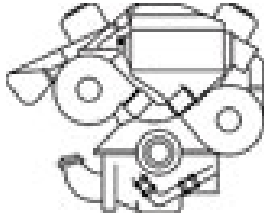
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Welcome to the fifth issue of the MEST Journal, an international peer-refereed academic journal, official journal of the non-profit organization MESTE, and the Faculty of Business and Industrial Management of the "Union" University in Belgrade, and the SZ & Associates - Toronto. This issue is published online and in print

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We keep the practice that articles, that have undergone peer review, and will be published in the next issues, we make available to readers in the form of preview - early reading. The focal point of the journal remained at international level, with the view on matters from a global perspective. However, due to their importance, in this issue have been published some papers relating to some specific local events.

In this issue twenty-one of submitted papers were published, of which five were classified in the group of research scientific papers, six in the group of scientific review papers, and five in the group "Case study". Here are also published one professional paper and one position paper. Most of the articles is multidisciplinary. However, ten papers could be classified to the area of economics. Other articles belong to groups of finance, management, technology or environmental sciences.

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Prof. Dr. Zoran Čekerevac
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- Educational research
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- Application of IT in higher education
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- Information security
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- Technology forecasting
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These are basic, but not exclusive themed areas.



Article No.	Category Name(s) of the author(s) TITLE OF THE ARTICLE DOI	Page No.
#1	Research paper Iurii Vasyliovych Pasichnyk FINANCIAL MANAGEMENT OF MONETARY FLOWS IN UKRAINE DOI 10.12709/mest.03.03.01.01	1
#2	Research paper Artur Stefanski CAPITAL STRUCTURE OF FAMILY BUSINESSES IN COMPANIES SEATED IN THE WIELKOPOLSKA REGION DOI 10.12709/mest.03.03.01.02	11
#3	Research paper Sonja Gegovska-Zajkova, Nevenka Kiteva Rogleva, Vangel Fustic THE ALIGNMENT OF THE ORGANIZATIONAL BUSINESS STRATEGY AND PROJECT MANAGEMENT METHODS DOI 10.12709/mest.03.03.01.03	21
#4	Review article Eva Romančikova ENVIRONMENTAL POLICY TOOLS TO PROTECT ENVIRONMENT DOI 10.12709/mest.03.03.01.04	30
#5	Research paper Nataliia Nazukova METR MODEL FOR MEASURING TAX BURDEN ON INVESTMENT IN UKRAINE DOI 10.12709/mest.03.03.01.05	37
#6	Case study Daniela Todorova OPPORTUNITIES FOR ECONOMIC DEVELOPMENT OF BULGARIA THROUGH PUBLIC PRIVATE PARTNERSHIP DOI 10.12709/mest.03.03.01.06	48
#7	Review article Anatolii Humenyuk STRUCTURAL ANALYSIS OF PRINCIPAL THREATS TO ECONOMIC SECURITY OF THE REGION IN THE PROCESS OF EUROPEAN INTEGRATION DOI 10.12709/mest.03.03.01.07	54
#8	Review article Victoriia Blyzniuk, Larisa Guk TRANSFORMATION OF INSTITUTION OF EMPLOYMENT AS AN ADAPTATION OF THE LABOR MARKET DOI 10.12709/mest.03.03.01.08	68
#9	Position paper Walter E. Block, William Barnett II REJOINDER TO HUDIK ON TRANSITIVITY DOI 10.12709/mest.03.03.01.09	81
#10	Case study Vasyl Grygorkiv, Andrii Verstiak, Mariia Grygorkiv MARKET ANALYSIS OF ENTERPRISE RESOURCE PLANNING SYSTEMS WITH FOCUS ON UKRAINE DOI 10.12709/mest.03.03.01.10	87
#11	Case study Nadiya Danko-Yutish INNOVATIVE MECHANISMS OF REGULATION OF INTERREGIONAL SOCIO-ECONOMIC ASYMMETRY IN UKRAINE DOI 10.12709/mest.03.03.01.11	95
#12	Case study Oksana V. Shinkaryuk STATE ADMINISTRATION FORMATION OF REGIONAL HUMAN DEVELOPMENT IN UKRAINE DOI 10.12709/mest.03.03.01.12	104



Article No.	Category Name(s) of the author(s) TITLE OF THE ARTICLE DOI	Page No.
#13	Review article Vladimir Gozora ECONOMIC SECURITY OF SMALL AND MEDIUM ENTERPRISES DOI 10.12709/mest.03.03.01.13	114
#14	Case study Nataliia Matsiuk SOLUTION OF TRAVELLING SALESMAN PROBLEM FOR WHOLESALE OUTLAYS CONSIDERING REPEATED VISITATION OF CERTAIN SALES OUTLETS DOI 10.12709/mest.03.03.01.14	120
#15	Research paper Victoria Vysotska LINGUISTIC ANALYSIS AND MODELLING SEMANTICS OF TEXTUAL CONTENT FOR DIGEST FORMATION DOI 10.12709/mest.03.03.01.15	127
#16	Case study Victor Laschak CONSUMER PROTECTION AND PRICE CONTROLS IN UKRAINE DOI 10.12709/mest.03.03.01.16	149
#17	Review article Viktor Voytsekhovskyy, Viktoriya Voytsekhovska METHODOLOGICAL ASPECTS OF QUANTITATIVE ASSESSMENT OF THE POLLUTION REDUCTION - STATUS AND TREND DOI 10.12709/mest.03.03.01.17	163
#18	Review article Ladislav Kabat, Stanislav Filip ALTERNATIVE POSSIBILITIES OF DETECTION OF MANIPULATION WITH THE ACCOUNTING DATA DOI 10.12709/mest.03.03.01.18	170
#19	Professional paper Milutin Matković PROBLEMS OF TOURISM DEVELOPMENT IN THE REPUBLIC OF SERBIA DOI 10.12709/mest.03.03.01.19	177
#20	Case study Sasho Kjosev, Ljupcho Eftimov SUSTAINABLE DEVELOPMENT PLANNING – THE CASE OF MACEDONIA DOI 10.12709/mest.03.03.01.20	185
#21	Case study Ana Bovan, Tatjana Mamula ENERGY EFFICIENCY AS A SUSTAINABLE MANAGEMENT CHALLENGE - CASE OF SERBIA DOI 10.12709/mest.03.03.01.21	195
A1	Reviewers	205
A2	Instructions for authors	208
A3	Submission instructions	212
A4	Reviewer's report	213
A5	Templates for MEST Journal papers	215





FINANCIAL MANAGEMENT OF MONETARY FLOWS IN UKRAINE

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Abstract

The essence and specific features of cash flows of the Consolidated Budget of Ukraine, income and spending, the banking sector are studied. Theoretical trends explaining the origin and formation of the cash flows are analyzed. The classification of cash flows according to six basic features - type, direction, nature of the impact, hierarchical levels, levels of control, elements of the financial system has been developed. The comparison of some countries of the world with Ukraine on the indicators of territory, population, unemployment, the average monthly wage, GDP and exchange rates is presented. The structure of GDP by income in 2012 was analyzed. Therefore in the result of the stated analysis it has been discovered that the wages (51%), gross profit and mixed income (34.8%) constitute the greater proportion.

The reasons hindering the effective administration of the tax to the state budget are studied. To ensure effective tax administration and the formation of optimal flows of the Consolidated budget of Ukraine relevant principles are offered. The financial flows of the population, in particular the income and expenditure structure in 2012, are analyzed in details. The analysis revealed that the greater part of the income structure belongs to wages (42.2%), and the cost structure includes the purchase of goods and services (83.8%). 2009-2012 The available supply of money in circulation and deposits of households for the period of 2009-2012 was analyzed. The appropriateness of management of these funds for advanced manufacturing and innovation has been studied. The appropriate methods of forecasting of cash flows of mathematics are offered. Reasonable suggestions for effective management of financial flows in Ukraine in the fields of corruption reducing, tax legislation improving, and the formation of effective control mechanisms are grounded.

Keywords: incomes and spendings, consolidated budget, financial flows, financial management.

ESSENCE AND PARTICULARIZES OF FINANCIAL FLOWS.

In today's world economic reality processes financial flows take an increasing importance. The

consequences of the global financial crisis showed that the loss of control of a virtual financial capital leads to a contradiction between the world's financial centers, groups of countries, forms the so-called "swelling" (over-accumulation) of the unsecured "financial bubbles", or so-called virtual finance, when the speed of financial transactions exceeds commodity ones.

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As noted by V. Bourtsev in modern terms financial factors of world economic system transformation take an enormous importance:

- a rapid development of trans-nationalization process of economic relations, the integration of national financial markets, globalization of the world economy;
- permanent weakening of the regulation of the world financial markets;
- expansion of the global financial system by means of incorporation into the world economy of the developing countries;
- steady increase in the great mass of capital, high concentration of capital on both macro- and micro- levels of a state;
- the tendency towards capital concentration, increasing autonomy of major financial players who have a significant financial power;
- a significant number of financial instruments and a high level of their dynamism;
- competition and conflict increase among states in economic and other fields, the use of aggressive strategies by powerful market participants, capture of the world economic area (Burtsev, 2001, p. 23).

World economic system of XXI century is fundamentally new than it was in the XVI-XVII centuries, when independent financial resources were formed, functioning as the corresponding flows.

As E. Lazicheva (2009) notes the finance importance means that the way to regulate the distribution relationship may affect the economic output, economic growth and thereby control the economic and social development of any territory. In today's realities, in particular in the literature on financial management, there hardly can be distinction between financial and cash flow in understanding of the nature of financial flows [(Senchagov & Arkhipov, 2007), (Romanovski, 2009), (Tikhomirov, 2008)].

In the modern sense, the financial flow consists of identical as follows from its content elements that are the essence of money. Therefore, cash flows can deterministically be regulated by the state, corporate bodies and the population. Destabilization of financial flows is possible due to the loss of control on the part of the corresponding subjects.

Over the past four centuries when financial flows became so great that were reflected in the relevant economic directions, in particular, including cameralism, one of the first developed. Their evolution varied around the basic postulate, the level of state intervention in economic processes. Proponents of one approach, starting from Adam Smith, included monetarism, the theory of a free market by F. Hayek, and many other schools, proved the effectiveness of self-regulation of business processes of market mechanisms.

Supporters of the other one, the Keynesians and their numerous followers, considered the effectiveness of financial flows to be in a strict government regulation.

With varying degrees of success these approaches have been used over four centuries, however XXI century is characterized by a fundamentally new quality and volumes of financial flows. Globalization has led to another characteristic that is the absence of control by the intergovernmental financial institutions, governments and some corporations. U.S. President Barack Obama once said that it is necessary to forget the myth of the "invisible hand of the market". He pronounced this speech at the end of the first decade of XXI century, when the United States was covered by a wave of financial turmoil. Also the following years, during which the governments of almost all countries tried to boost the economy in a centralized manner, confirmed the lack of effectiveness of market regulation.

It is appropriate to recall the prophetic words of J.K. Galbraith that in the future all the benefits of capitalism (the prevailing market economy) and socialism (the prevailing state regulation) will be used.

Let us consider some views on the theoretical study of financial flows management.

According to the present day synergetic approaches to the evolution of the world economic development, including the role of financial flows one should take into consideration the fact that the world is dual and that is its main characteristic; it is enough to mention the main elements of its structure, confirming it - day and night, man and woman, black and white, positive and negative, etc.

The synergetic approach means that the flows that must be controlled by the state, and lower order flows must be monitored by the relevant economic

participants. This combination can be effective. If the basic functions of the financial system are broken, the distribution and control ones, there appears corruption, abuse, inefficient use of resources, etc. that reduces the level of GDP, lowers economic growth. The reduction of living standards is the result of these processes.

The lower cash flow accountability at all levels of the economy, the greater the likelihood of embezzlement of budget funds, in some cases leading to the social disruption.

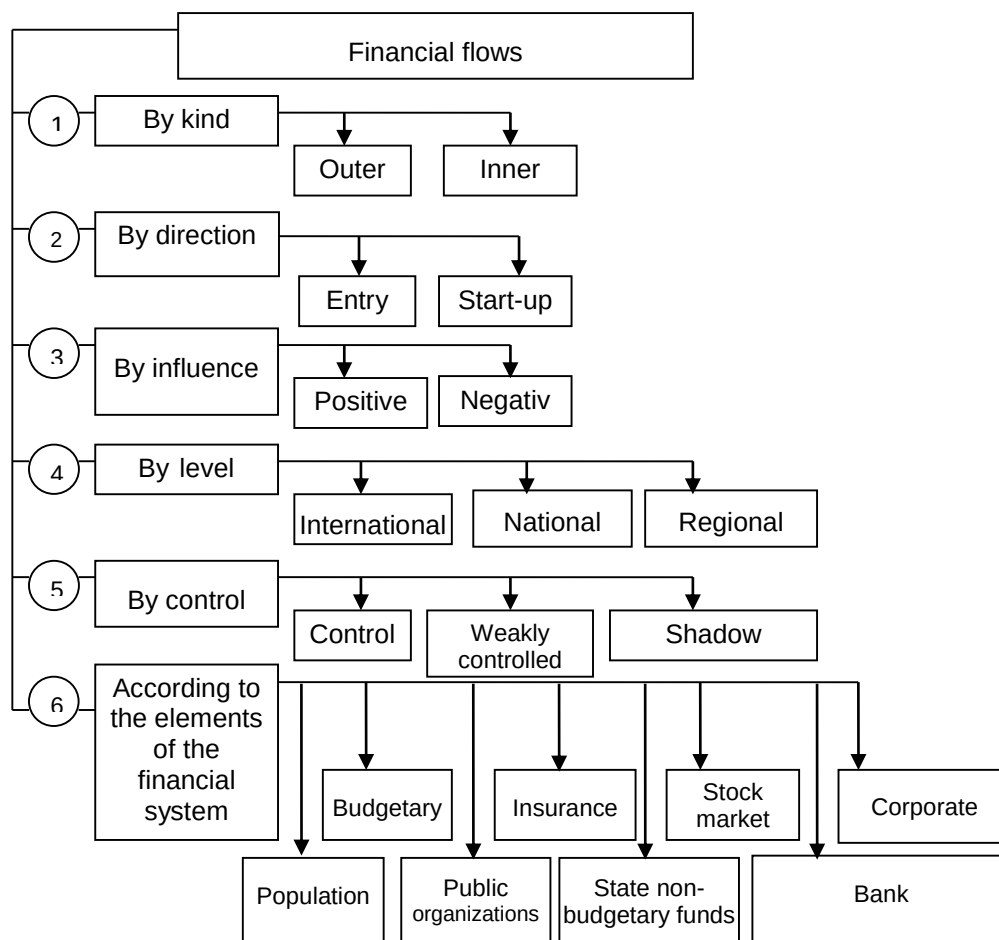


Fig. 1. Classification of financial flows

As it can be seen from Fig. 1, there is a whole variety of financial flows. Their effective management needs creation and implementation of positive flows under the permanent control of public entities with independent experts, specialists in this area, analytical agencies. But the control is not enough; response mechanisms must be formed as a part of the state, corporations and public agencies. That's the way to ensured social progress.

V.O. Kyo expressed an appropriate idea about this situation: "The power owned by business in the American politics, will confuse an individual with democratic tendencies: a relatively insignificant

minority has an extraordinary power" (Olson, 2004, p. 192).

Therefore, in today's reality monetary flows must be not only optimally and efficiently formed at all hierarchical levels, but also must establish their effective management and control of their occurrence with the appropriate response mechanisms.

To clarify the nature and significance of the place of Ukraine in the world economic system and identify the volume of financial flows in Ukraine let us study key indicators of the some countries, table 1 (Derzhavna sluzhba statystyky Ukrayiny, 2013, pp. 517-542).

Table 1 Basic indices of some countries and Ukraine (data for 2011 year)

Country	Indices				
	Territory, thousand square km.	Population, in millions	Unemployment rate, %	Average monthly wages, USD	GDP in billion USD
1	2	3	4	5	6
Great Britain	242.9	62.7	8.0	4,198.6	2,063.3
Spain	506.0	46.1	21.7	3,133.2	1,244.5
Italy	303.3	60.7	8.4	3,260.6	1,642.7
Canada	9,970.6	34.5	7.4	4,668.0	1,234.6
Germany	357.0	81.8	5.9	3,916.9	2,828.0
Poland	312.7	38.5	9.7	1,146.8	692.2
Russian Federation	17,075.4	143.0	6.5	806.3	2,178.6
Slovenia	20.2	2.1	8.2	2,557.3	50.3
USA	9,629.1	312.0	8.9	4,537.5	13,299.1
Croatia	56.5	4.3	13.5	1,459.4	70.3
Montenegro	13.8	0.6	19.7	658.0	6.6
Ukraine	603.5	45.5	7.9	330.5	291.1

Source: (Derzhavna sluzhba statystyky Ukrayiny, 2013)

According to the data in table 1 Ukraine, despite the large area and population, as well as the initial favorable conditions of development after the collapse of the Soviet Union, now has the lowest standards of living in Europe. Correspondingly, the insignificant level of GDP compared to other countries makes Ukraine weak according to the criteria for monetary flows - the volume of inter-economic operations, income, bank resources, etc. Meanwhile, the price levels of food, utilities, transport are lower several times than in Europe.

Thus, when the exchange rate of the UAH to the dollar during 2011-2013 was 8:1, and euro was 11:1, and in early 2014, was respectively 10:1 and 14:1 the standard of living is satisfactory.

Thus, the cost of utilities in 2014 for an apartment with the area of 60-70 m² is approximately 40-45

euro, and public transportation fare is 0.1-0.15 euro per trip.

According to the Tax Service of Ukraine there were 3011 UAH millionaires in Ukraine and according to the rates of magazine "Forbs" there were 5 "dollar" billionaires.

It should be also noted that official statistics of Ukraine indicated that the economy inflation constitutes 50%. The situation with the indicators, forming the financial flows, leads to uncontrolled and unpredictable processes.

Let us take, for example, Ukraine's GDP. The study will be started with the structure of GDP during 2009-2012 (Table 2) (Derzhavna sluzhba statystyky Ukrayiny, 2013, p. 35).

Table 2 Gross domestic product by the categories of the final use

	2009	2010	2011	2012
	million UAH			
GDP	913,345	1,082,569	1,302,079	1,408,889
Final consumer expenditures	772,826	914,230	1,113,008	1,269,601
Households	581,733	686,082	865,860	986,540
Gross fixed capital formation	167,644	195,927	241,785	265,349
Goods and services export	423,564	549,365	707,953	717,347
Goods and services import	438,860	580,944	788,901	835,394

As it can be seen from table 2 the GDP during 2009-2012 continued to grow. In terms of comparisons to the previous year, the increase took place as follows: 2009 to 2008 - 85.2%, 2010 to 2009 - 104.1%, 2011 to 2010 - 105.2% 2012 and 2011 - 100.2% (Derzhavna sluzhba statystyky Ukrayiny, 2013, p. 27). This disparity can be explained by the actions of the State to management to overcome the effects of the financial crisis.

A negative external imbalance which by the way, is continuing to grow every year, had also a significant impact on these processes.

In the structure of GDP for the period of 2012 almost half goes to salaries of employees (Figure 2) (Derzhavna sluzhba statystyky Ukrayiny, 2013, p. 34).

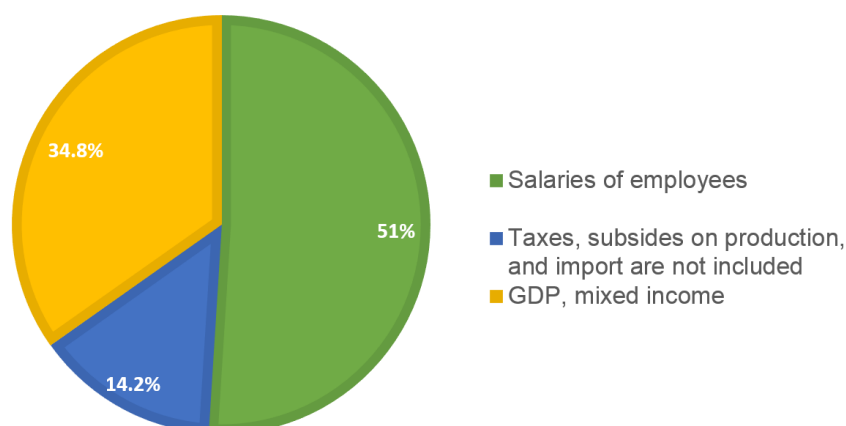


Fig. 2 GDP structure by the income criteria in 2012, %

Despite the relatively large volumes of GDP in monetary equivalents according to the data of table 1 in dollar terms it is 10 times less. Therefore, Ukraine's GDP compared to such countries as Poland is 2.4 times smaller, Spain - 4.3 times, and in relation to the developed European countries - Great Britain - 7.1times, Italy - 5.6 times, and Germany - 9.7 times.

Ukraine, even after a rather difficult political and economic circumstances in early 2014, has the potential to increase GDP, contributed by the relevant factors of output growth in agriculture, construction, metallurgy, food sectors.

Some reasons for this claim arise after the signing of political agreement with Ukraine the EU in March, 21 2014, and then in the economic field. An important lever for restoring normal economic processes is harsh methods to combat corruption, promote the legalization of financial flows throughout the real economy.

BUDGETARY FLOWS.

Let us study the features of management of budgetary flows (Table 3) (Derzhavna sluzhba statystyky Ukrayiny, 2013, p. 54).

Table 3 Consolidated budget of Ukraine (million UAH)

	2009	2010	2011	2012	2012 to 2009 %
Income	272,967.0	315,406.0	398,554.0	445,525.0	163.2
Tax income	208,073.2	234,447.7	334,691.9	360,567.2	167.3
Non-tax income	58,435.8	73,837.0	60,003.7	80,923.3	138.5
Expenditures	307,399.4	377,842.8	416,853.6	492,454.7	160.2
All-state functions	33,156.0	44,902.5	49,874.7	54,590.2	164.6
Defense	9663.3	11,347.1	13,242.2	14,486.9	149.9
Economic activities	39,753.0	43,832.4	57,124.1	62,377.4	156.9
Health care	36,564.9	44,745.4	48,961.6	58,453.9	160.0
Education	66,773.6	79,826.0	86,253.6	101,560.9	152.1
Social protection and social security	78,775.4	104,534.9	105,434.8	125,306.9	159.0

As it can be seen from table 3 revenues and expenditures of the consolidated budget of Ukraine during 2009-2012 in absolute terms were permanently increasing, and it should be noted that costs increased slightly to a lesser value, although in absolute value, they are great. It can be explained by a permanent budget deficit.

The increasing role of tax revenues in the income structure, grounded by the ordering of the tax revenue due to the adoption of the Tax Code of Ukraine, which entered into force in 2011, should also be noted.

The reduction in defense spending, compared with total expenditure should also be noted as a negative fact.

The budget policy for one year is formed in accordance with the Constitution of Ukraine and the Budget Code of Ukraine. This process involves the Ministry of Finance, Ministry of Economy and Trade, the National Bank of Ukraine. These directions are discussed at the meeting of the Cabinet of Ministers of Ukraine, agreed with the President of Ukraine and submitted for the approval by the Supreme Council of Ukraine.

This document specifies the amount of public debt, its structure, the current weight of intergovernmental transfers and equalization coefficients for local budgets, the share of capital investment expenditures of the State budget.

The starting point for the calculation of budget revenues at all levels, as well as spending is to evaluate the performance of the consolidated and state budget in previous years.

However, despite the elaborate since Ukraine's independence planning system revenues and expenditures, the level of collection of revenues to the budgets of all levels is inadequate. Expenditure planning is also ineffective. It occurs under the following conditions:

- lack of conceptual strategic research on political, social and economic development;
- revenues and expenditures planning practice of the consolidated and state budget for one year, although the Budget Code of Ukraine provides for a three-year term;
- lack of an effective mechanism for planning of expenditures for economic development and social needs;
- ineffective control over the revenues and expenditures of public funds.

To control the financial flows forming the consolidated budget a special attention must be paid to the tax flows. Almost before the beginning

of 2014 in Ukraine there was no clear control over the activities of individual business units, allowing them to hide large sums from paying. Certain tax corruption schemes prevented from collecting taxes. To remedy this situation, it is advisable to apply the following principles of management of tax payments:

- necessity to use rules on taxes and fees, determined on the basis of actual data about tax objects and tax liability of taxpayers for tax violations;
- equality which means the prevention of any discrimination, insurance of an objective approach to entities in determining the obligations of taxpayers and charges that carry mandatory payments, the only approach that should provide the best approach to the design and implementation of tax legislation with the definition of a particular taxpayer, the tax object, source tax, identification of the tax period, tax rates, the justification of grounds for granting benefits to individuals and corporate taxpayers, equality and proportionality, which involves tax collecting from legal entities and individuals in a certain proportion of earned income and the corresponding tax provision of proportionality depending on the amounts of income, economic soundness, which implies that the fair tax and duties with regard to indicators of the national economic development, individual regions, which aims to balance the cash flows of the budget income, the uniformity of payment, which includes the timing of the payment of taxes and fees for expenditures to fund programs for economic development, administrative and military structures, law enforcement, various social benefits, including low-income families with children, the disabled, etc.; competence, which includes installation and adjustment of taxes and fees, as well as the benefits to businesses and individual tax payers defined in the Tax Code structures, including the Supreme Council of Ukraine, city, town, village councils, accessibility, providing security, clarity of tax laws for all workers, without exception, the tax service bodies, employees of financial institutions of local state administrations and local self-government, individuals and corporate taxpayers; social justice, which includes providing social support to the poor

using differentiated and progressive income taxation.

- using a synergistic approach for the formation of the budgetary flows allows to develop effective schemes of budgetary flows;
- taking into account the power of influence of external and internal factors, including those formed by the state management, and in some cases may be of decisive importance;
- identify institutional change in future periods, with the important and significant impact on the final budget figures. The institutional changes include: the dynamics of world markets on major financial markets, exchange rate against other currencies, inflation, the dynamics of energy prices, increases in

minimum social standards, GDP growth, taking into account the volume of production in key sectors of the economy of Ukraine.

Budgetary flows are relatively small compared to those the population was involved, therefore let us find out the features of the management of these financial flows.

HOUSEHOLD INCOME

Let us study the situation with the financial flows forming the household income. The data from table 4 is to be analyzed with this purpose (Derzhavna sluzhba statystyky Ukrayiny, 2013, p. 375).

Table 4 Income and savings of the population (mln. UAH)

	2009	2010	2011	2012	2012 to 2009 %
Income	894,286	1,101,175	1,266,753	1,407,197	157.4
including					
salaries	365,300	449,553	529,133	593,213	162.4
social service	364,572	423,741	469,386	526,944	144.5
Expenditures	894,286	1,101,175	1,266,753	1,407,197	157.4
Goods and services	709,025	838,213	1,030,635	1,179,071	166.3

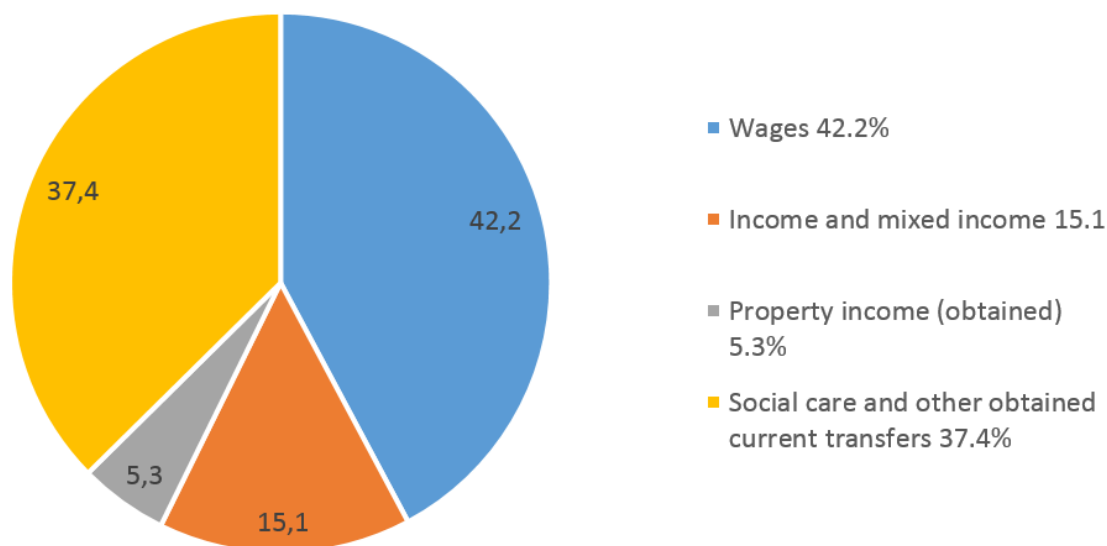


Fig. 3 Structure of the household income in 2012 in %

Table 4 shows that household incomes are constantly rising, and are actively involved in the structure of all financial flows of the States.

Taking into account that the situation of the income and purchasing power of the population of Ukraine in comparison with other countries was briefly described above, it can be added that about

twenty percent of Ukraine's population is poor, and about thirty percent gets salaries that are lower than average ones in Ukraine.

Let us analyze the household income structure in 2012 (fig. 3) (Derzhavna sluzhba statystyky Ukrayiny, 2013, p. 376).

As it can be seen from Fig. 3 the largest share in the structure of income is wages (42.2%), and various social benefits (37.4%).

Here are data on household spending (Figure 4) (Derzhavna sluzhba statystyky Ukrayiny, 2013, p. 376).

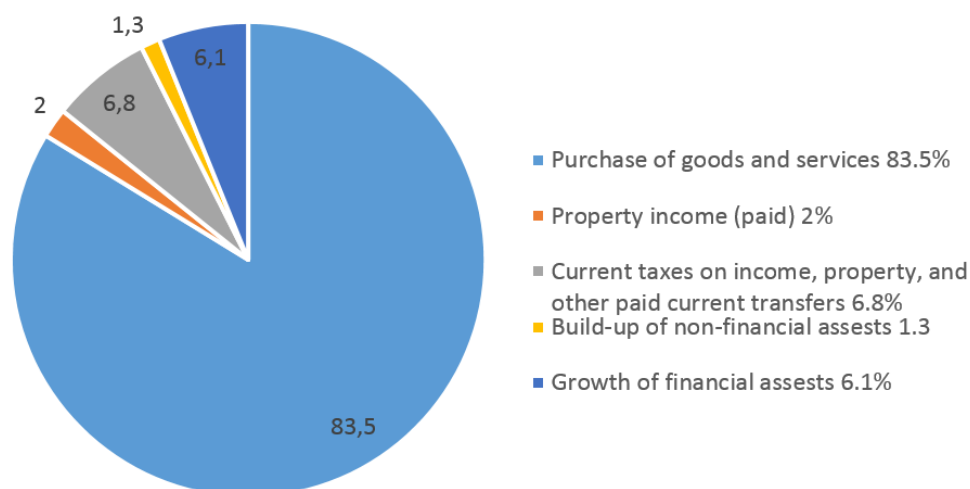


Fig. 4 Structure of the spending and savings of the population in 2012, %

As it can be seen from Fig. 4 people in Ukraine have a rather large share of the costs for the purchase of goods and services - 83.8%, and an extremely small fraction - the actual financial savings - 6.1%.

goods. The low level of financial savings is due to the sharp "jumps" of the national currency against the dollar and 8,2:1 10.5:1 euro during 2010-2013 and 10.0:1 14,5:1 and in the euro at the beginning of 2014.

This situation is justified by the fact that despite the relatively low inflation rate - 12.3% in 2009, 9.1% in 2010, 4.6% in 2011 and 0.2% (deflation) in 2012 the population does not feel promising stability and therefore invests money in durable

The particularities of the financial flows calculated by the National Bank of Ukraine will be investigated (Table 5) (Derzhavna sluzhba statystyky Ukrayiny, 2013, p. 59).

Table 5 Currency in circulation in Ukraine (at the end of the year, mln. UAH)

	2009	2010	2011	2012	2012 to 2009 %
Monetary supply (M0)	157,029	182,990	192,665	203,245	129.4
Monetary supply (M1)	233,748	289,894	311,047	323,225	138.2
Monetary supply (M2)	484,772	596,841	681,801	771,126	159.1
Monetary supply (M3)	487,298	597,872	685,515	773,199	158.7

Monetary aggregates are obligations of depository corporations to other resident sectors such as general government agency and other depository corporations. Money supply M0 comprises currency in circulation outside depository corporations. Monetary aggregate M1 - M0 monetary aggregate and transferable deposits in national currency. Monetary aggregate M2 - M1 monetary aggregate and transferable deposits in foreign currency and other deposits. Monetary

aggregate M3 - M2 monetary aggregate and securities other than shares. Since 2003, monetary aggregates are based on standardized report forms for the National Bank of Ukraine and other depository corporations (banks) according to the IMF methodology. The data on household savings on deposit are presented (Table 6) (Derzhavna sluzhba statystyky Ukrayiny, 2013, p. 59).

Table 6 Deposits of households, employed by the deposit corporations (National Bank of Ukraine is not included) (at the end of the year, mln. UAH)

	2009	2010	2011	2012	2012 to 2009 %
Total	214,098	275,093	310,390	369,264	172.5
In currency					
National	101,081	142,924	160,530	186,772	184.8
Foreign	113,017	132,169	149,860	182,493	161.5

The data in table 6 shows that household incomes are growing quite actively, thus as it follows from the data in table 5 the available money supply M3 for the resulting index does not exceed the GDP growth rate for the respective years, which is evidence of a relatively tight monetary policy of the NBU during these periods and the prevention of the unwarranted inflation.

There feasibility of managing these funds is to support innovative development of Ukraine. However, high interest rates to attract credit resources of the banking system - from 25 to 35% for a year substantially limit these opportunities.

Regarding personal income forming strong monetary flows is the income of "labor immigrants", citizens of Ukraine, who went abroad to work. According to estimates of experts of the National Bank of Ukraine and the Ministry of Finance of Ukraine the number of immigrants reaches 3 million, and monetary flows, legally going through banks, in 2012 reached nearly 10 billion U.S. dollars. The taxation problem of income was revealed by the Tax Service of Ukraine, has found considerable opposition from the general population and has not been implemented.

Regarding the objective necessity of forecasting financial flows it is advisable to use a technique suggested by Ukrainian scientists S. Londar, R. Shevchenko (Londar & Shevchenko, 2011, pp. 65-66).

When forecasting using the elasticity, the elasticity of the predicted performance based on changes in the tax base is estimated (usually - GDP, GVA, payroll, etc.) in retrospect, and the coefficient of elasticity is based on future periods. On this basis the forecast of economic indicators for the future is done.

The elasticity shows a relative change (percentage) of the economic indicator at the

relative change in the independent variable X for 1%.

Elasticity is calculated by the formula:

$$E_{y(x)} = \frac{x}{y} \cdot \frac{\Delta y}{\Delta x}$$

Correspondingly:

$$\Delta y = \frac{E \cdot y \cdot \Delta x}{x}$$

Therefore the predicted value equals to:

$$y_{\text{III}} = y + \Delta y = y + \frac{E \cdot y \cdot (x_1 - x)}{x} = y \left[1 + E \left(\frac{x_1}{x} - 1 \right) \right]$$

where x_1 is a future value of the factor value (Londar & Shevchenko, 2011, pp. 65-66).

Using this technique allows to calculate the corresponding financial flows in the expected dimension.

CONCLUSIONS

Management of financial flows in any country takes a crucial importance because it governs the dynamics of economic growth, thus directly affecting the well-being of the population.

The analysis of the management of financial flows in Ukraine during 2009-2012 years in particular in the formation of the consolidated budget, household incomes showed that the effective management of these flows prevented corruption, lack of strategic planning of the economic system as a whole and individual sectors, the lack of proper control of these flows. As a result in terms of living standards Ukraine occupies last position in Europe.

Country renovation that began in 2014 will definitely promote the formation of new social relations, including the economic area, in particular the formation of transparent financial flows.

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CAPITAL STRUCTURE OF FAMILY BUSINESSES IN COMPANIES SEATED IN THE WIELKOPOLSKA REGION

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Abstract:

The main objective of the article is to compare the capital structure of selected family and non-family businesses among the SMEs seated in the Wielkopolska region. Considering the research needs, a hypothesis was put forward that family businesses are more conservative in financial management, which results in a higher share of the equity capital and a higher rate of long-term liabilities to total liabilities. The definition of a family business is not explicit. For the needs of the study, the SFI (Substantial Family Influence) indicator proposed by S.B. Klein will be taken into account. For the research purposes, the financial results of 116 entities were taken into account. The sample included 29 non-family firms (16 producers and 13 service companies), the remaining 87 were family businesses (46 producers and 41 service companies). The research results confirm the hypothesis that family businesses are more conservative in terms of capital structure.

Keywords: family business, family firms versus non-family ones, SME, company's age, capital structure, debt structure

1 INTRODUCTION

Following the research conducted in Poland, European Union and other countries, family-run businesses make up a considerable share among SMEs, especially high among small business entities. It is mainly because a family does not usually guarantee a sufficient, for the needs of a

given business entity, supply of individuals with proper skills and knowledge to run a company. Moreover, establishing and running a family business seem to be identified with the activities aimed at surviving unfavorable market conditions as family economic security (Więcek-Janka, & Kujawińska, 2010).

The main objective of the article is to compare the capital structure of selected family and non-family businesses among the SMEs seated in the Wielkopolska region.

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Considering the research needs, a hypothesis was put forward that family-run businesses are more conservative in their financial management, which results in a higher share of their equity capital and a higher rate of long-term liabilities to total liabilities ratio.

2 THE DEFINITION OF A FAMILY-RUN BUSINESS

Either theoreticians or practitioners cannot agree as to the one and uniform definition of a family-run business since this category includes both small family-run entities as well as big enterprises controlled by one or a few families. There is also no consensus reached as to the criteria of distinguishing family firms, though most often the following factors are taken into account: family-owned business structure, family control over the company's strategy, the participation of family members in management processes as well as the engagement of more than one generation in the company's business activity (Handler, 1989). After all, one of the most distinctive research tendencies touching upon family-run businesses is the search for the characteristics of such companies which may aim at a more precise definition of a *family business* (Marjański, 2011).

The discrepancies concerning the definition of a family business influence the research results of this category of enterprises. For example, considering the research conducted on the American market, the adoption of various definitions of a family business leads to, for example, the following conclusions (Shanker, & Astrachan, 1996):

- the number of family businesses changes within the range of 4.1 million to 20.3 million,
- the number of employed in family businesses ranges from 19.8 million to 77.2 million people;
- family businesses possess from 12% to 49% share in the produced GDP.

The review of available publications allows to distinguish four basic approaches to the family

business based on the following criteria (Stradomski, 2010):

- ownership¹,
- ownership and management;
- legal nature;
- other.

According to the ownership criterion, a family business is a company where a family is the majority shareholder. However in practice there appear some methodological problems because private investors (families) sometimes take advantage of complex legal provisions to hide their presence as an owner in a given entity. Therefore, relatively frequently family succession is used as an auxiliary criterion supplementary to the ownership criterion which constitutes its distinctive feature.

Pursuant to the ownership and management criterion, a family firm is a business entity in which:

- a family is the majority shareholder or controls shareholding size directly or indirectly,
- the managerial functions are performed by one, dominant family members.

Pursuant to the legal criterion, family businesses are such entities whose owners belong to one family due to their capital contribution or the rights to the company were acquired by inheritance. It has to be emphasized, however, that this approach highlights only the capital element because the notion of a family business neither exists in the family law nor constitutes a separate category of commercial law.

The approaches to defining a family business enumerated above tend to be supplemented with other criteria, e.g. the application of the F-PEC scale (*Family-Power, Experience and Culture Scale*), which apart from encompassing the ownership, management and supervision criteria also takes into consideration succession and organizational culture (Stradomski, 2010).

¹ P. Dharma in cooperation with the team provides as many as thirty definitions of family-run businesses among which in

more than twenty the family capital share is the key determinant (Dharma, 1996).

Having analyzed the collected empirical material on the basis of the information obtained from credit documentation compiled in banks for the purpose of the paper herein, the ownership and management criterion using the SFI (*Substantial Family Influence*) indicator proposed by S.B. Klein (Klein, 2000) will be adopted in the definition of a family-run business. Each entity will be considered a family company, pursuant to the assumptions made by the majority of analyses, in which the SFI indicator was applied (Stradomski, 2010), for which the SFI indicator will take the values higher than one.

3 THE REVIEW OF RESEARCH ON FAMILY BUSINESS CHARACTERISTICS

While characterizing family businesses it is worth emphasizing some of their properties. One of them is the fact that family owners will prefer controlling the growth of the total enterprise value. Moreover, they are distinguished by the succession element from other business entities (Martyniuk, 2013), whereas the mode of conducting business is, to a great extent, the subject of personal traits of their owners and successors. These preferences concern e.g. a lower risk tolerance (Winnicka-Popczyk, 2011). This fact is confirmed by other research which say that family businesses are characterized by a lower share of working capital (Stradomski, 2010), which would indicate a more conservative management of the net working capital.

The engagement of the family in running current affairs of the company may result in lower efficiency of the entity due to the fact that family members will have to realize simultaneously their business and non-business objectives. This may be reflected in lower profitability of the company. It is supported by the argument that assets and costs are often transferred between the company and private persons and the preference of long-term stabilization of the company to the profitability of capital equity (especially short-term). In the case of family-run businesses it is also emphasized that they are characterized by a low risk tendency which is well explained by preferable stabilization aimed at long-term (many-generations) survival. Consequently, they prefer

higher capital equity, which does not allow to take a full advantage of the financial leverage to improve their profitability (Stradomski, 2010). Such entities pass down some values from generation to generation contributing to a more conservative approach to financial management (Gallo, Tepies, & Cappuins, 2004), and their nature is of crucial importance to the level of debt, which is usually lower (Ampenberger, Schmid, Achleitner, & Kaserer, 2009; Jewartowski, & Kołdoński, 2012; Winnicka-Popczyk, 2005).

So far, the majority of research proves that family-run businesses relatively rarely, due to their characteristics, take advantage of other, than their own capital, sources of financing. Nevertheless, if they do, they most often apply for bank's loans (Róžański, & Marszałek, 2012).

The key element to understand the peculiarity of a family business is to define the objective of its functioning. The superior goal of a company with a dispersed ownership structure and the division between ownership and managerial functions is to maximize the total enterprise value for the owner, while respecting the interests of other stakeholders, which, certainly, may differ e.g. depending on market conditions. In the case of family companies the situation is slightly different since, though respecting the necessity to maximize the total enterprise value, still such a monistic approach may lead to narrowing the horizon from which the company is perceived. For family-run businesses what counts most is usually business survival and stable development. It also seems that family owners will opt for controlled growth of the total enterprise value (Stradomski, 2010).

Family engagement in current affairs may result in decreased profitability of the entity due to the fact that family members will have to realize business and non-business objectives (Stradomski, 2010), which may find its reflection in lower profitability.

4 THE STRUCTURE OF FAMILY BUSINESS CAPITAL

The theory of capital structure presents three approaches to the structure definition. The first defines the capital structure as so called permanent financing, i.e. equity capital and long

term liabilities. The second approach, apart from the above enumerated elements, takes into account short-term liabilities, though operating liabilities, i.e. such liabilities which are non-interest bearing (Ross, Westerfield, & Jordan, 1995) are omitted. The third approach identifies the capital structure with liabilities structure (Gajdka, 2002).

The third approach which will be applied in the analysis. Moreover, it will be crucial to distinguish equity capital, long-term and short term liabilities. In order to measure a specific capital structure, the following indicators will be used: the equity capital share in total liabilities ratio and the long-term liabilities share in total liabilities ratio, obviously with regard to scientific achievements in the theory of capital structures and their verification.

The arithmetic average values for both indicators will be calculated separately for family and non-family firms with respect to the line of business. In order to avoid the influence of some extreme observations, the medians of these indicators will be used as well. Next, the tests of differences significance will be performed between the average values and medians in both groups of the analyzed entities. The standard parametric test will be used for the difference in average values and non-parametric test (U Mann-Whitney) for the differences in medians.

The capital structure in SMEs has been studied many times, and most often it was proven that the structure itself is far closer to the pecking order theory of capital structure (Hall, Hutchinson, & Michaelas, 2000; Poutziouris, 2001; Zoppa, & McMahon, 2002). While reviewing different publications, there appear some sporadic research which do not confirm this thesis. Sometimes it has been suggested that the capital structure of small companies is similar to, using the same business branch criteria, the observations made on big companies (Korkeamaki, & Rutherford, 2006). However, the insufficiency of explicit conclusions drawn from capital structure studies may indicate that one of the possible directions of developing the research on capital structure may be the definition of capital structure determinants which are of the biggest

importance for particular types of enterprises (Kubiak, 2013) including the family-run ones. Additionally, the research clearly define the determinants of capital structure as e.g. being the owner of the company as well as the person of the owner alone (Łuczka, 2013), which also justifies the interest in family-run businesses.

There are relatively few studies done which focus on the verification of capital structure in family-run firms. In such business entities some values are passed down from generation to generation and that may result in a more conservative approach to financial management (Gallo, & Vilaseca, 1996; Poutziouris, 2001; Gallo, Tapie, & Cappuins, 2004). And its character has a significant influence on the debt level, which is usually lower (Ampenberger, Schmid, Achleitner, & Kaserer, 2009; Lopez-Garcia, & Sanchez-Andujar, 2007). However, some opinions may be found that actually there are no differences in terms of financial characteristics between family and non-family businesses (Coleman, & Carsky, 1999; Anderson, & Rebb, 2003), and the structure of capital is influenced by the size, age and entity profitability.

The capital structure in family-run companies was also the subject investigated by Polish researchers (Sułkowski, 2004; Jeżak, Popczyk, & Winnicka-Popczyk, 2004; Różański, & Marszałek, 2012; Jewartowski, & Kołodński, 2012). On the whole, the research made on a group of family businesses seated in Poland indicate that such companies do not take advantage of foreign capital so eagerly.

It is worth noticing that the majority of researchers surveying family-run firms uses the data concerning big, often public, entities. The studies on the capital structure of family-run businesses within the SMEs scope are almost nonexistent in professional publications. Therefore, the attempt to deepen the studies discussed in this article will modestly fill in this gap.

5 RESEARCH SAMPLE

The financial results of the entities were compiled in the project carried out in cooperation with SBG

Bank S.A. and associated cooperative banks². Thanks to the project it was possible to collect the data from 642 business entities excluding, however, individual farmers. In the entire population, there dominate entrepreneurs functioning as one-person companies (302 entities, i.e. 47%). The number of partnerships is equal to 147 (23% of the population) and limited companies comprise 30% of the population (193 entities in total, among which 152, i.e. 79%, comprise limited liability companies). The project was implemented in 2012, therefore the majority of financial data dates back to 2010. The group was divided into family and non-family entrepreneurs on the basis of the SFI indicator. The non-family firms included two most numerous represented lines of business in a given population, i.e. plastic producers (8) and machinery and equipment maintenance entrepreneurs (7). Hence, two economy sectors are represented here: production and services. Next, out of family-run firms the companies operating in the same lines of business were selected (respectively 38 and 21).

In order to make the research results impartial, since the first group of companies is represented by debtors, the entrepreneurs from selected businesses (using the REGON criteria, i.e. the National Register of Business Entities data base) were asked to give their financial results for the same year, i.e. 2010, and the data allowing for the assessment if the company was a family-run or not. This stage was carried out in cooperation with the Association of Private Employers in the Wielkopolska region. The request was sent to 400 entities. The answers were given by 47 entities, however, 5 were incomplete.

Finally, for the research purposes, the financial results of 116 entities were taken into account, 74 of which were provided by the banks. The sample included 29 non-family firms (16 producers and 13 service companies), the remaining 87 were family-run businesses (46 producers and 41 service companies).

6 RESEARCH RESULTS

The general results of the population surveyed for capital structure is included in Table 1 from which the following conclusion may be drawn. In family-run businesses there may be observed a slightly higher share of the equity capital. The difference between average equity capital in a balanced sum is equal to 4 percentage points, slightly higher when the median is used since it reaches 7 percentage points.

In terms of the liabilities structure indicator, there is a significant difference between family and non-family companies as well. The first has a higher share of long-term liabilities. If the arithmetic average is used, the difference equals 9 percentage points, and in the case of median – 8 percentage points.

Table 1. Arithmetic average values and medians of capital structure indicators in family and non-family firms (%)

Enter-prises	Equity capital share		Long-term liabilities share	
	arithmetic average	median	arithmetic average	median
Family	77	79	25	24
Non-family	73	72	16	16

Table 2. p-values for the tests of significance for the differences

Statistical test	Equity capital share		Long-term liabilities share	
	a.a.	m.	a.a.	m.
T.TEST	0.0983		0.2109	
Mann-Whitney U test		0.0864		0.1711

a.a. – arithmetic average

m. - median

For both values (arithmetic average and median) tests of differences significance were conducted between family and non-family run businesses.

² “Researchers in the companies of the Wielkopolska region – research internship as a chance to improve innovativeness

and competitiveness of the businesses crucial for the region” (POKL.08.02.01-30-004/11)

The calculation results are presented in Table 2. If the arithmetic averages are compared, the standard parametric test was applied (T.TEST) for the difference. Whereas while comparing medians, the non-parametric Mann-Whitney U value test. A 10% level of significance was adopted.

On the basis of the results obtained from the tests of significance for the differences, the conclusion may be drawn that only in the case of capital equity share ratio the differences observed are statistically crucial, which was verified both with a standard parametric test for the differences in averages as well as non-parametric Mann-Whitney U value test for the difference in medians. Similar results were achieved in both tests, i.e. at the level of 10% of significance one can find the reason to reject the hypothesis of equality between averages and medians between family and non-family businesses. In the case of the analysis of long-term liabilities share, the hypothesis about the equality between averages and medians in both selected groups of enterprises cannot be rejected.

The surveyed population reveals some variations in capital structure indicators depending on business sector. Table 3 depicts the values for analyzed indicators in enterprises groups selected with regard to the sector of the economy.

Table 3. Arithmetic average values and medians for capital structure indicators in family and non-family businesses depending on the business sector

Enterprises	Line of business	Equity capital share		Long-term liabilities share	
		a.a.	m.	a.a.	m.
Family	production	69	70	30	28
	services	86	84	14	15
	total	77	79	25	24
Non-family	production	70	70	21	21
	services	78	77	11	12
	total	73	72	16	16

In the group of production companies the capital equity share ratio is generally lower than in service companies. This observation refers to

both family companies and other. But the differences between family and non-family businesses in terms of the value for the indicator of capital equity share can be noticed only in service companies (the difference between arithmetic average of the indicator equals 8 percentage points and in the case of median – 7 percentage points). In the producers group they fluctuate around 1 percentage point only.

Similarly, as in the case of capital equity share, in the liabilities structure one can notice the differences depending on the sector. A higher ratio is observed in production companies and, as above, the observation refers to both family and non-family companies.

A lower equity capital share ratio and simultaneous higher long-term indebtedness in the group of production companies can be explained by a greater absorption of costs of business activities and, consequently, the necessity to use other sources of financing.

Mean values for the indicators of family and non-family businesses structure depending on the number of employees are included in Table 4.

Table 4. Arithmetic average values and medians for indicators of capital structure in family and non-family businesses depending on the number of employees

Enterprises	Number of employees	Equity capital share		Long-term liabilities share	
		a.a.	m.	a.a.	m.
Family	0-9	82	83	29	31
	10-24	83	83	25	24
	25-49	75	74	19	20
	50 and more	71	73	21	20
	total	77	79	25	24
Non-family	0-9	82	80	24	22
	10-24	69	69	17	18
	25-49	74	74	15	15
	50 and more	70	72	14	12
	total	73	72	16	16

Analyzing the data included in Table 4, it can be easily observable that generally the bigger the size of a family company is, measured by the

number of employees, the smaller capital equity share ratio (the value for ratios in the companies employing up to 10 people and from 10 to 25 people actually remains at the same level, which does not question the conclusions). In the case of non-family businesses such a correlation cannot be put forward. For this population the highest value for the indicator was recorded in the group of companies employing up to 10 persons and the lowest in the group of firms employing between 10 and 24 people. However, a generally higher share of capital equity is observed in smaller companies. It is compatible with common practice and scientific research which indicate a limited access of smaller companies to foreign sources of financing and, simultaneously, capital equity preferred by such entrepreneurs.

Such conservative approach of smaller business entities, especially in the group of family companies, was confirmed by the values for the indicator of long-term liabilities share. Its higher values are observed in the group of family businesses especially in the case of smaller companies. The highest share of long-term liabilities in family companies is recorded among the entities employing up to 10 people, the mean value for the indicator equals 29% and is by 8 percentage points higher than in the biggest family firms selected among the analyzed groups. However, it is worth noticing that the lowest ratio was observed in the group of firms employing between 25 and 49 people, i.e. 19%. Similar correlations are observed in the group of non-family companies. Also here the smallest companies base their business activities on long-term liabilities.

Interesting conclusions can be drawn from the analysis of company structure indicators depending on the age of the entity. The data concerning this part of the analyzed population are included in the table 5.

In the case of family-run businesses, the highest share of capital equity is observed in the companies operating on the market for up to two years (87%). Also a high level of indicators is seen in the oldest companies which conduct their business activity for at least ten years (83%). The lowest values for the indicator was recorded in the group of companies functioning between 4 and 6

years. The results indicate the necessity to use mainly their own financial means at the beginning of their business activity, whereas next the external financial support is observable, which facilitates their further development or acceleration, hence lower values for this indicator. Simultaneously, in the group of the oldest companies again the percentage of capital equity increases, which may be connected with a greater financial stability of these entities, and at the same time, is a sign of their conservative approach.

Table 5. Average values and medians for capital structure indicators in family and non-family businesses depending on the entity's age

Enterprises	Entity's age (in years)	Equity capital share		Long-term liabilities share	
		a.a.	m.	a.a.	m.
Family	(0-2>	87	85	0	0
	(2-4>	73	74	0	0
	(4-6>	66	64	35	34
	(6-8>	81	78	12	8
	(8-10>	78	78	32	35
	> 10	83	85	7	9
	total	77	79	25	14
Non-family	(0-2>	79	79	8	8
	(2-4>	65	68	4	5
	(4-6>	75	71	16	17
	(6-8>	82	80	12	14
	(8-10>	70	72	24	19
	> 10	67	69	21	18
	total	73	72	16	16

In the group of non-family businesses, in the initial years of their operating on the market, the share of capital equity is also high, though not the highest since this was observed for the companies operating from 6 to 8 years (82%). Similarly, in the subsequent years (2-4 years of functioning) the share of capital equity decreases dramatically and reaches its bottom (65%). On the contrary to family companies, in the group of the oldest companies the share of capital equity does not increase, but conversely is close to the minimal value in the population, which results

from deriving benefits from achieved financial performance by the owners who are not family representatives. It may suggest that in the case of family businesses the objectives connected with securing the sustainability of conducted business activity are more emphasized and realized to a greater extent.

Surprising results refer to the share of long-term liabilities in the structure of foreign capital. In the group of family companies, huge variations in this indicator are observed. The entities functioning for up to 4 years do not take advantage of long-term financing, which is probably related to the necessity of focusing their attention on sustaining company's liquidity and taking advantage of operating lease as a source of financing capital assets. The highest share of long-term liabilities is recorded in the companies which function from 4 to 6 years and between 8 and 10 years. In the case of non-family businesses the distribution of the mean value for the indicator is more differentiated. It may be observed that older entities more eagerly take advantage of long-term financing which may be well explained by a greater credit score of such entities.

In the analyzed population there is no significant difference noted in the structure of capital taking in the consideration the legal nature of the entity though slightly (by 2 percentage points if arithmetic average is used and by 1.5 percentage points in the case of median) lower share of capital equity in the companies pursuant to the commercial law.

7 CONCLUSIONS

Summarizing the results of conducted analysis it can be stated that among family-run businesses

the share of capital equity is higher than in the case of non-family firms. Smaller family firms (employing up to 10 people) use capital equity more often, which are either at the beginning of their business activity development or are the companies of an established position and conduct their business activity for many years (more than 10 years).

In terms of the share of long term liabilities to total liabilities ratio, family-run companies are characterized by a higher, than in the case of other entities, indicator and there are generally no significant differences depending on the number of employees in these firms. Whereas taking into consideration the age of the company, then in the case of a family business it is hard to decide explicitly on the evaluation since there are huge variations in the values for the indicator in particular companies groups. In the case of non-family companies, smaller companies show a significantly higher share of long-term liabilities and the indicator grows together with the age of such entities.

It is worth noticing that there exist significant variations in the values for capital structure indicators depending on the line of business and irrespectively of whether the company is a family one or not. A higher share of capital equity was observed in the group of service companies rather than production ones, whereas the share of long-term liabilities was higher in the case of producers.

Concluding, the research results confirm the hypothesis that family businesses are more conservative in terms of capital structure. Due to the research sample the results cannot, however, constitute the basis for further generalizations.

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THE ALIGNMENT OF THE ORGANIZATIONAL BUSINESS STRATEGY AND PROJECT MANAGEMENT METHODS

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Abstract

The paper deals with one of the most important issues of the organizational business strategy in companies in developing countries, running their businesses in the age of "New Economy". The alignment of the project management methodologies, tools and techniques with company's strategy is one of highest priorities for top managers and their decisions. The survey and the analysis of the results create a basis for an insight into the conditions that are present in our practice, concerning application of the project management methodologies, especially using ICT in conducting their businesses in a sensitive economic environment, as it is in developing countries. The results of the study may help companies for appropriate business strategy development in the new business and market environment.

Keywords: business strategy, project management methodologies, industry survey, new economy, ICT

1 INTRODUCTION

The most important task in every company is business development along with a proper organizational strategy. It is necessary to take the

lead in realizing that strategy vision, which means that it has to be implemented and tested to prove that it leads the company to success. This requires innovation, constantly following new trends and technologies and application of methods and tools of the project management.

Company's strategy should correspond to the business area in which a company wants to

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achieve its *business needs*. It should also be viable for that particular business in last decade when a New Economy is increasingly accomplished through *projects* (Grant, 2002).

As a result of such trend, it is obvious that today, the company business strategy is mostly affected by the projects. It means that the company has to adapt itself to the new project oriented business environment. The alignment of the undertaken projects and their methods with the company's business strategy is the essential factor for the success, also.

However, it is very important to understand the *business needs* and the *business strategy* of the company and how to realize those needs, as well as how to accomplish the strategy. This is a way to attain an important and necessary competitive advantage, which could result in business success. The knowledge necessary for realizing company's projects is basis for achieving competitive advantage in the new business and economic environment.

For better business strategy fulfillment, some organizations have already implemented Information and Communication Technologies (ICT) systems. The use of ICT systems requires a good perception of the business environment, as well as the market opportunities. Good analysis is essential to find the best and most appropriate solution among all offered in the market. Success could be achieved through development activities, starting with a good analysis, development and finally implementation and evaluation of the solution.

It is, therefore, necessary to apply *Project management* and its methods and techniques. Project management, as a basis for successful implementation of the project, includes detailed planning of the activities that creates the conditions for success and strategy implementation, leadership, business processes and goals, skills, systems and risks. Thus, it organizes the system's work in the project.

It is generally accepted misconception that techniques of project management are procedures that are easy to learn and implement. But does it work in some developing countries with

lack of Project management knowledge and skills?

This paper summarizes the results of a survey concerning the implementation of project management methods, tools and techniques conducted on various companies in the Republic of Macedonia. Data sets for statistical analysis were collected using an originally created questionnaire. One of the critical criteria analyzed by the client questionnaire was *client satisfaction*.

To achieve this goal, in Section 2 of this paper there is a brief overview of the most commonly used project management methodologies. The research methodologies adopted in this study are described in Section 3. In Section 4 there is analysis with a focus on the survey results, and, finally in Section 5, conclusions and remarks are provided.

2 PROJECT MANAGEMENT METHODOLOGIES

There are many different project management methodologies and techniques. Here, we highlight the most commonly used methodologies: Agile, Crystal, Waterfall, PRINCE2 and RUP, emphasizing their advantages and disadvantages.

Agile methodology is based on short iteration cycles, which allows better respond to changes in business environment. One of the key principles in Agile development is to avoid unnecessary bureaucracy and documentation. When implementing Agile methods, the role of the team often takes central stage. Agile also means: more learner control, team responsibility, empowerment of the project officers. The project leader in an Agile environment focuses mainly on coaching and encouraging leadership. Project officers with insufficient seniority or lack of responsibility that cannot handle this freedom, cannot participate in an Agile environment (Dijk, 2009).

In other words, the Agile method means that a project is delivered at agreed times in small complete parts useful for the customer. The advantage of delivery in parts is an opportunity of sooner receiving feedback that can be used for the next parts. It requires the appropriate information system, which can be delivered in small complete parts. At the start of the project, the requirements

do not need to be known entirely and in detail. This enables starting with a project whilst not all requirements are known at detailed level. In the Agile working method, it is of vital importance for everything delivered to be of extremely high quality. When constantly iterating, one wants to be able to trust everything that is finished. The products of an Agile project will also be taken into production, so there is a need for various types of documentation.

Crystal is a family of Agile software development methodology (Cockburn, 2004). The starting point is the fact that the projects properties change depending on the number of people involved and the criticality of the project, ranging from loss of money to loss of life.

Crystal introduces the importance of people and communications, and adjusting the techniques used in a project to the characteristics of that particular project. While other software development methods, particularly other Agile methods, do stress the importance of people, the Crystal family uses a focus on people and communications as its organizing principle, and most of the properties and techniques are based on strengthening that process.

Crystal Clear is part of Crystal family of methodologies, where every methodology is characterized by a color. That color represents the number of people for which the methodology is suited. Crystal Clear is the lightest color and is meant for the smallest project groups, of two to eight people. Darker colors are for larger groups.

Unlike traditional thick methodologies, as PRINCE2 is, Crystal Clear is flexible as to what project teams are supposed to do and how to do it. This is expressed in the properties over technique and stretch to fit principles. In fact, Crystal Clear is designed to be usable for as many project groups as possible, with the least number of new techniques to learn.

One of Crystal Clear's major strengths is also its principal disadvantage: it tries to be a methodology that is applicable in as many cases as possible, which prevents it from ever being the "best" methodology in any specific case.

The Rational Unified Process (RUP) was acquired by IBM in 2003. It is a thick methodology, which means that the whole design process is described highly detailed. Thus, it is applicable mostly on larger projects. Unified Modeling Language (UML) easily adapts the methodology to the needs of a various projects or companies. In RUP, an iterative approach is used unlike a Waterfall approach. It means that the phases of requirements, analysis, design, implementation, integration and testing, are not done in strict sequence. Each iteration includes some, or most, of the development disciplines (Kroll & MacIsaac, 2006).

This iterative approach leads to higher efficiency. Testing takes place in each iteration, not just at the end of the project life cycle. Thus, problems are noticed earlier, and are therefore easier and cheaper to resolve. When using waterfall approach, it can happen that some project members have to wait for the completion of a previous phase before they start their iteration cycle. Using an iterative approach solves this problem. Integration and implementation will happen not only at the end of the project, but in each iteration. This saves time, since more team members can work more of the time.

RUP is a commercial product that it is not open and it has to be bought from IBM. It is a very complex methodology, sometimes difficult to comprehend for both project managers and project members. For successful implementation, every participant in the project has to learn working with RUP. Therefore, it is not the most appropriate methodology for most small projects.

Project in controlled environment (PRINCE2) is a process-based methodology for effective project management, used in the private and public sector (Barker, 2013). It is a structured approach to project management and provides a method for managing projects within a clearly defined framework. PRINCE2 describes procedures for coordinating people and activities in a project, for designing and supervising the project, and envisage the activities in case the project does not develop as planned and it has to be adjusted. In this method, each process is specified with its key inputs and outputs and with specific goals and activities, which has to be carried out, which gives

an automatic control of any deviations from the plan.

PRINCE2 provides a common language for all participants in the project. The various management roles and responsibilities involved in a project are fully described and are adaptable to suit the complexity of the project and skills of the organization.

Besides the key concepts of PRINCE2, there are some other advantages of its use. It is a standard methodology providing organizations with a standard approach to the management projects. The methodology embodies proven and established best-practice in project management. It is widely recognized and understood, and so provides a common language for all participants of the project. PRINCE2 is very useful for educative use. It enables project to have a controlled and organized start, middle and end, regular reviews of progress against plan, flexible decision point, the involvement of management and stakeholders at the right time and place during the project, as well as good communication channels between the project, project management and the rest of the organization.

Every project member should be quite familiar with every aspect of PRINCE2, which can be consider as a disadvantage of this methodology. It is very expensive to give everyone involved a course to study PRINCE2. A lot of documents and lists have to be written, and because project managers only have to inform project board about the status of the project, when something goes wrong they can easily blame others. Splitting up a PRINCE2 project often results in a lack of knowledge of the project by responsible persons, like the project manager.

In the **Waterfall** methodology, development phases happen sequentially. The progress is seen as flowing steadily downwards like a waterfall through the phases of conception, initiation, analysis, design, construction, testing, implementation and maintenance. One of the differences between Agile and waterfall methods is that testing of the software is conducted at different stages during the software development lifecycle. In the Waterfall model, there is always a separate, testing phase near the completion of

an implementation phase. However, in the Agile model, testing is usually done concurrently with coding, or at least, testing jobs starts in early iterations.

Every project is different and therefore demands a different approach. When the demands are clear and stable, it is reasonable to choose a waterfall approach. When large dynamics and software with a high degree of interactivity are involved, then it is more appropriate to choose the Agile method.

3 RESEARCH METHODS

The survey was conducted in November 2013 among companies in Republic of Macedonia. For the data collection activity, a specific questionnaire was designed. The target group consisted of different types of companies. The questionnaire objective was to collect information about the respondents' and their awareness regarding implementation of project management methodologies. Another objective was to investigate the user satisfaction with respect to specific project management method implementation. The questionnaire surveyed tools and techniques in use, their benefits, as well as the level of success of projects within the organizations with respect to the project parameters, such as time, cost and quality.

The data collected was analyzed and is represented graphically in this paper by considering the percentages.

4 SURVEY RESULTS

The data from the questionnaire were used to determine the following issues:

- organization profile (the number of employees, years of existence, type, etc.)
- IT project implementation,
- project management in IT project implementation,
- awareness of the existence of project management methods and tools in use,
- benefits of project management implementation in IT project.
- According to the results, 30 of 36 surveyed organizations (83%), have either 50 to 250

employees, or more than 250 employees. Only 2 of them have less than 10 employees, and 4 have up to 50 employees, as it is shown in the Fig.1.

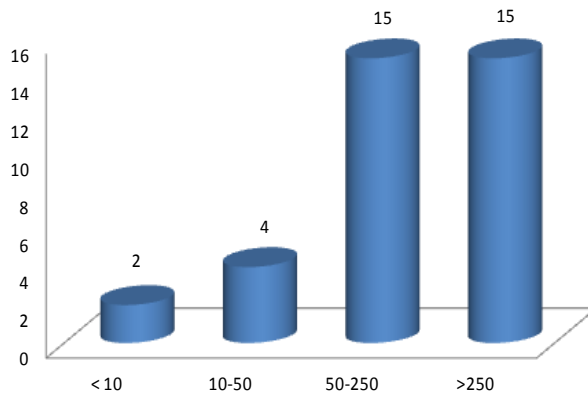


Fig. 1 Number of employees

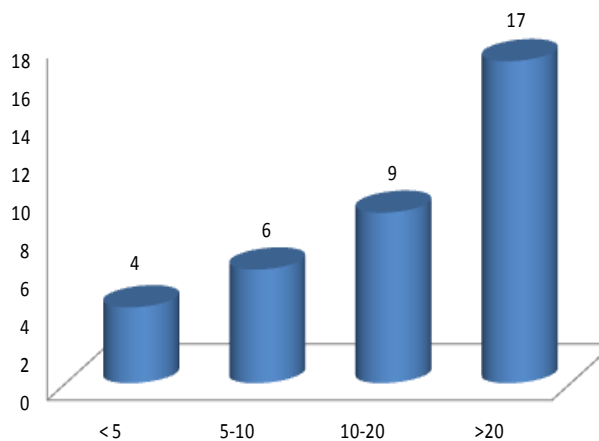


Fig. 2 Period of organization existence

Almost half of surveyed organizations (47%) exist more than 20 years, while 25% exist between 10 and 20 years, which is relatively long period, having in mind that Macedonia exists as an independent country since 1991 (see Fig.2).

The survey was conducted in different types of organizations like companies, banks, schools, insurance companies etc. 11 of the surveyed organizations were companies.

The educational, administrative and financial institutions, were equally represented (by 8 of each type), as it is shown in Fig. 3.

The second set of questions was about implementation of Information and Communication Technologies projects.

The results show that 86% of respondents use IT. Only 8% never applied IT, and does not intend to do it, while the remaining 6% intend to apply IT in the future.

This result is certainly a good indicator for the organizations, since it shows increasing awareness of the usefulness of technologies application for improving processes and facilitating the work of the organization.

About 92% of the companies believe that business strategy can easily be implemented through the use of ICT systems, while only 8% are not sure of it. No organization responded that ICT do not help in the implementation of business strategy.

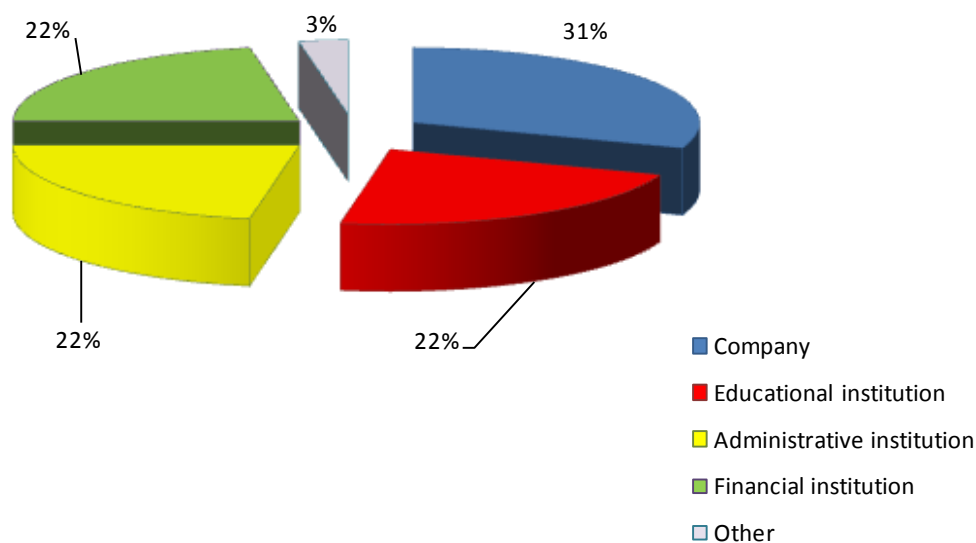


Fig. 3. Type of the organization

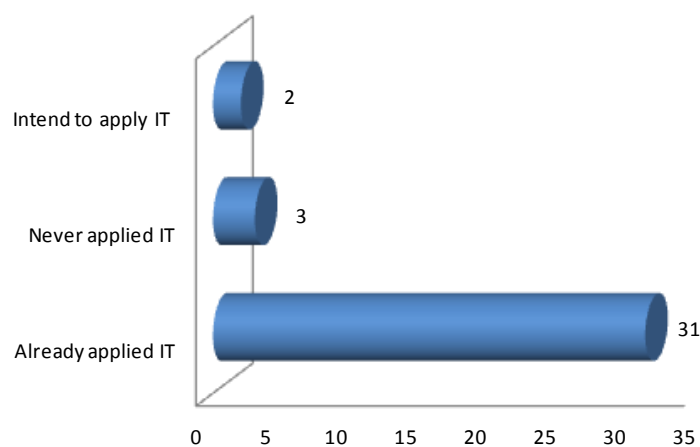


Fig. 4. Implementation of ICT in the organizations

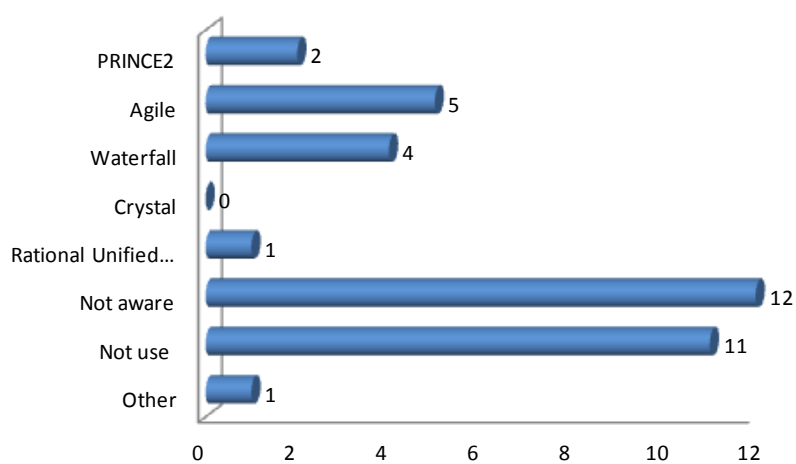


Fig. 5. Implementation of project management methods

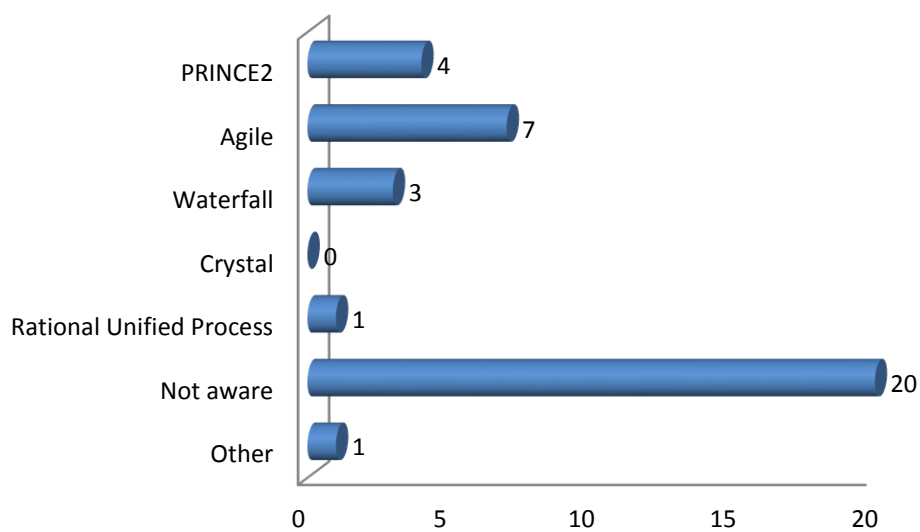


Fig. 6. Ranking the best project management methods

The final set of questions concerned the application of project management in the implementation of ICT projects. The results show that 53% of respondents apply project management in the implementation of ICT. More than a quarter of respondents (28%) are not familiar with project management at all, while 19% have no answer.

Surprisingly, more than half of the respondents either do not use (31%), or are not familiar (33%) with application of any project management methodology of in their organization. The most popular project management methods, as it is shown in Fig. 5, are Agile methodologies (16%), followed by Waterfall model (13%). Two organizations implement PRINCE2 (5%), while the Rational Unified Process (RUP) is used in only one organization (3%). There is also one organization that did not implement project management methods, but use external services. About 56% of the respondents did not know which method is the best for a successful implementation of ICT projects. 19% of them believe that Agile methods are the best, followed by PRINCE2 (11%), Waterfall method (8%) and the Rational Unified Process (3%). The rest 3% of the organizations, believe that it cannot be clearly determined which method is the best (see Fig. 6).

They also believe that it would be the most appropriate to use a combination of few methods, or integrate the best practices, which are adapted to the needs and processes in the company.

The last question concerns the respondents' opinion about the benefits from the application of project management in the implementation of ICT projects. According to the survey results, the majority of respondents believe that the greatest benefit is meeting the prescribed time frame and budget of the project. Application of project management provides: control over the project at any time, control of the project flow, which facilitates the design of deadlines, resources management and general coordination and organization of the project. No less important benefit is dealing with risks in the project, which eventually brings higher quality of services and projects.

Some respondents stated that the application of project management achieves higher reliability, increases data security, increases competitiveness and better services.

In general, all respondents believe that applying project management methods offer greater efficiency and more rational use of resources in the projects. It improves communication between stakeholders in the project and in a presence of any change of the schedule, it enables easy implementation of the Agile method.

Another benefit that was pointed out is the documentation of the project. This experience can be very useful for future projects. The implementation of project management results in better effectiveness and efficiency in the projects, leading eventually to a successful project.

5 ANALYSIS OF THE RESULTS

Analysis of the answers shows that all state institutions use ICT projects, but only half of them apply project management methods in their implementation. They typically use Agile methodologies and PRINCE2 method.

Almost all companies implement ICT projects. Most of them apply project management and its methods. The most commonly used is Waterfall model, followed by Agile methods. Some companies find that the best solution is a combination of PRINCE2, Agile and Waterfall. All respondents believe that it helps or will help in meeting their business strategy.

Only one of eight surveyed educational institutions use ICT in their work and none of them are familiar with project management and its methods, although most of them suppose that using ICT it would help their business strategy.

The banks are implementing ICT projects, but only part of them applies specific project management methodology, such as RUP, Waterfall and Agile. They think that application of project management methodology would lead to a better organization of the work within the planned parameters, greater control and also more successful projects.

The main reasons for the failure of the projects are as follow: unexpected new demands from clients, poor communication between team members (working on the project) and between users and key stakeholders. Furthermore, the following

issues could be added: not clearly defined requirements, the alignment of business processes and management's strategy requirements and excessive costs of scope of works. In the beginning of the project, one of the important problems is the lack of in-depth analysis of requirements, design, as well as a selection and hiring the best employees that have appropriate skills for project implementation. Since there is no proper analysis in advance by end users, very often there is a problem in the selection of tools and methods that correspond with their real business processes.

The analysis of the questionnaire answers shows that only half of the organizations in the Republic of Macedonia applied project management methods. The other half is not familiar with the methods and techniques and their application. In the companies that apply project management, the most popular are Agile methodologies. According to the answers, the companies believe that it is the best methodology to be used, but the implementation depends on the type of project and its complexity. The use of project management software is very important in the application of project management portfolio, since it significantly facilitates the successful work of project managers.

Although only a half of the organizations in the Republic of Macedonia applied project management methods, it is our opinion that some internal guidelines exist, so that new entrants to the organization can at least follow the relevant procedures. This perception was not explicitly measured by our survey. We suppose that some reasons for the absence of a formal methodology include, among others, the limitation of time allocated for completion of a project, as well as lack of employees' appropriate training regarding software project management. (Louws, 2008)

From the survey data it seems that the use of a project management methodology emphasizes

quality management versus cost management. Planning and procurement management are also well represented, followed by human resource management, communications management and risk management. It is, however, possible that human resource management, communications management and risk management are addressed separately, rather than by the methodology employed, although grouping all these tasks would be helpful.

The information gathered from the questionnaires, after analysis, reveals that project managers are not entirely comfortable with the methodologies in use, given that the latter does not appear to yield expected success rates.

6 CONCLUSIONS

According to the survey results, we can conclude that most of the organizations are aware of the benefits of ICT in the implementation of business strategy and they apply them to facilitate the business processes in the organization. But many projects, even in the more developed countries in the European Union (McManus & Wood-Harper, 2008), failed and did not achieve the desired goals. As it was already concluded in the analysis, the main reasons for the failure of the projects are changes in project scope and communication between the key stakeholders participating in a particular project.

Some of the developing countries usually have to face with a shortage of skilled staff, difficult economic and social conditions and turbulent political situation, which could be the reasons of limited implementation of project management methods and technique. The awareness of the necessity to maintain-up and apply project management knowledge, skills and technique, should be an objective for the top managers in the Age of the New Economy.

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ENVIRONMENTAL POLICY TOOLS TO PROTECT ENVIRONMENT

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Abstract

The objective of the contribution is to point out the broad range of environmental policy tools, which can be used to protect environment. These tools include: standards, financial and economic tools having the form of environmental payments, emissions trading and voluntary agreements. Differences in implemented tools generate different economic efficiency and environmental effectiveness.

Environmental taxes stimulate polluters to reduce emissions in cases when costs of their reduction are lower than the environmental tax they are obliged to pay. The stimulation function of environmental taxes needs to be continuously evaluated so that it does not prevent the flexibility of polluters in looking for cost-effective ways of reduction of the burden on environment. The practice of environmental policy tools implementation confirms that environmental protection solely in the form of environmental taxes is rare. Environmental taxes are normally enforced in combination with other environmental policy tools, which include standards, custom duties as well as voluntary tools. Voluntary tools are characterised as voluntary activities of polluters. They include environmental management systems and others.

Keywords: environment, environmental policy, internalisation of negative externalities, environmental standards, environmental taxes, emissions trading, voluntary agreements

1 INTRODUCTION

The issue of environmental pollution originates in the occurrence of side effects in the spheres of production and consumption. These side effects are called externalities by economists, and they are considered to be a reason leading to the failure of market's allocation function. It means that due to the existence of negative externalities, product prices do not reflect actual manufacturing costs, which results in excessive production related to environmental damage.

We need to realise that production costs only include one part of costs related to ensuring environmental balance. They are costs incurred by the purchase of ecological components of the manufacturing process. The second and decisive part of costs related to the occurrence of negative externalities in prices is absent.

The implementation of so called common burden principle upon the payment of costs of ensuring environmental balance not only encounters a lack of public resources, but it also leads to inconsiderate usage of environmental resources, their excessive exploitation and damage. Increased costs arise to other users of environment as a result of its damage. Costs of environmental damage are thus borne by

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someone else, not the entity having caused them. In an effort to solve this problem, economic theory applies a number of approaches to the given issue, including: bilateral agreements, environmental standards, environmental taxes, tradable permissions to pollute, and voluntary tools. This article aims at highlighting differences between basic approaches to the solution of internalisation of negative externalities and their different economic and environmental efficiencies.

2 ALTERNATIVE TOOLS OF ENVIRONMENTAL POLICY

The objective of environmental policy tools implementation is to influence the behaviour of economic entities. Following the way behaviour is influenced, we can deal with direct and indirect environmental policy tools.

Direct environmental policy tools have a form of orders, restrictions, standards as well as prohibitions of certain productions. Their application enables to achieve enhanced quality of environment in a short time. A negative feature of their usage is that they are too expensive from the national economic viewpoint, as they must be respected by everybody regardless of the amount of costs necessary for their shaping.

Indirect environmental policy tools are not regulations to protect environment, however they create pressure (stimulus) on polluters towards effective usage of environmental resources.

Further economic environmental policy tools include duties, emissions trades and voluntary tools.

2.1 Environmental Standards

Historically, environmental standards are classic tools originating in civil health legislation. A broader usage of standards as regulation tools started at the end of the 1960s and beginning of the 1970s. Standards of various types, aiming at fulfilling the environmental policy principle "order-check" were applied in this period. In this relation, standards were perceived as orders enforceable by means of respective law (Water Act, Clean Air Act, etc.). Non-fulfilment of standards was considered to be law violation.

Following the environmental protection need, several types of standards have been applied,

including emission standards, technological standards and product standards. It is necessary to emphasize that besides the environmental quality criterion, the establishment of standards is also influenced by technological and economic criteria.

Reflection of the quality of environment in standards presupposes the definition of a maximum allowed level of polluting substances in a selected element of environment, i.e. air, water, soil, aiming at securing zero risk of damage occurrence. Zero risk generally means the level of pollution protecting everybody from possible damage regardless of their sensitivity to it. However, this approach is reasonable to adopt in case of highly toxic substances.

It means that emission standards should be stipulated in so called threshold values. However, toxicological studies show that it is problematic to stipulate threshold values in many pollution cases. One of the reasons is the fact that knowledge on damage origin as well as synergic effects generated by pollution is only collected gradually.

Standards enforcement presupposes considering the latest technical solutions whose implementation helps increase environmental protection. A negative feature of standards implementation is that they are static and little stimulating. It is common that the implementation of technical progress is reflected in standards with time delays. Another disadvantage of standards is that their enforcement does not result in the minimisation of national economic costs of reducing one emission unit. This deficiency can be eliminated by implementing environmental taxes as well as emissions trading.

2.2 Emissions and Environmental Taxation

The reason for toolkit broadening towards the market was the knowledge on welfare economics theory, according to which labour, soil and capital are effectively allocated when commodity prices equal their marginal social costs. One of the conditions for effective resources allocation is the existence of equality between private and social costs.

The welfare economics theory was developed by English economist A. C. Pigou. He claimed that

inefficiency in resources allocation originates in the existence of negative externalities. He perceived negative externalities as costs imposed by one economic entity to another economic entity. He claimed that if costs incurred as a result of environmental pollution are not reflected in prices, external costs and subsequent market inefficiency arise. The elimination of inefficiency was seen in the enforcement of externality tax called the Pigouvian emission tax.

Pigou based its shaping on the assumption that if such tax equalled external costs, private costs of producers would increase at the level of production social costs and would become a tool of effective resources allocation. The amount of emission tax itself was stipulated in the intersection of the cost curve of marginal protection and the cost curve of marginal damage. Thus stipulated amount of emission tax was supposed to stimulate rationally behaving polluters to decrease all emissions whose reduction costs are lower than the tax amount itself (Pigou, 1932).

A restriction and at the same time a limit for the application of Pigouvian tax is the absence of information which the tax office does not have. This information can only be obtained from polluters and the aggrieved themselves. Exact quantification of Pigouvian emission tax is therefore impossible in practice.

Further objections against environmental protection management by means of emission tax also include the dynamics of economic growth itself, as well as the occurrence of deformations in economics, causing private costs to differ from social costs.

In the 1980s, the category of emission tax was reviewed from the viewpoints of its environmental efficiency, economic effectiveness and its fiscal effects. The new category of environmental tax started to be used parallel in this period.

Environmental taxes are taxes with incorporated eco regulator enforced within the taxation system of the given state, as well as emission taxes with different structure and mechanism of action (OECD, 2010).

Taxes with incorporated eco-regulator correspond to excise taxes at most by their character. They restrict production as well as consumption, which are related to negative impact on environment.

Emission tax is used to tax emissions originating as a side product of manufacturing process and deteriorating the quality of air, water and soil. From the viewpoint of economic nature, emission tax expresses the "rarity" of environmental resources expressing the substitution relationship between the quality of environment as a public good and as a medium used to exhaust harmful substances.

The definition of environmental tax category is significantly problematic due to the aforementioned two-dimensional apprehension. We can state that so far generally valid definition of this financial category does not exist anymore. The European Commission also pointed out this fact in its official papers, characterising environmental tax as a tax based on a physical unit or its analogous part having a specific negative impact on environment (OECD, 2007).

Under this definition, tax base can be: exhaust emissions (in the air, water, and soil); energy (fuels, oil, coal, natural gas, and electricity); agricultural inputs (fertilisers, pesticides); selected environmentally harmful products (plastic packages, batteries, tyres, etc.); as well as noise.

Present times are characterised by the condition when individual countries apply various types of environmental charges characterised by differences in their amounts, extent of emissions charges, as well as in types of the burden of environmentally harmful products.

The quantification of an efficient environmental tax presupposes the incorporation of a stimulus for polluters, encouraging them to look for ways of reducing environmental burden and minimising their costs. It means that polluters, aware of their marginal costs of environmental pollution reduction and environmental tax amount, will be encouraged to reduce emissions, if their costs of environmental pollution reduction by one emission unit are lower than the amount of applicable environmental tax on such an emission unit. Environmental tax limitations include an uncertain impact on the quality of environment, as the extent of environmental pollution reduction upon environmental tax enforcement is dependent on polluter's response to its amount itself. It is thus not sure that environmental tax implementation will result in achieving the stipulated objective, as responses of polluters cannot be precisely approximated. Further deficiencies in the

environmental taxation include increased costs of its regulation as well as the possibility of creating non-related decentralised company decisions. In cases when it is necessary to ensure a hundred percent certainty of environmental pollution reduction, it is more appropriate to achieve the stipulated objective by means of other tools. Such tools include the enforcement of standards as well as tradable permissions.

2.3 Standard Price According to W. J. Baumol and W. E. Oates

The awareness of negative features of Pigouvian emission tax led to the proposal of W. J. Baumol and W. E. Oates to enforce standard prices of using environmental resources upon environmental protection. Their amount should be derived from costs necessary for maintaining the quality of a selected element of environment (Baumol & Oates, *The Use of Standards and Prices for the Protection of the Environment*, 1971). They defined environmental quality standard as a maximum allowed amount of imissions. Imissions were considered to be the criterion, as they represent the information on actual local environmental pollution. It was highlighted that emissions are decisive for effective enforcement of environmental quality standard, as costs related to standard fulfilment depend on the extent of reducing harmful substances emissions.

Economic efficiency of the enforced “price” of using environmental resources is determined by possibilities of individual polluters to avoid emissions (Baumol, 1972), which means that it depends on what form of emissions reduction is used by polluters (production volumes reduction, changes to manufacturing programme, substitution of ecologically harmful manufacturing inputs, etc.).

A negative feature of the enforcement of prices derived from environmental quality standards is that stipulating high price can lead to increased costs of environmental protection. High price is a stimulus for polluters to carry out investments in pollution prevention. Price decrease will cause that newly built capacities remain, respectively can remain unused, as their operation would be connected to increased costs compared to the payment of enforced reduced prices.

In the opposite case, i.e. upon stipulating a low price, we can assume that facilities which will be built will not be as environmentally efficient as would be those built in case of higher price. These capacities would need to be modified upon price increase. Additional capacities modification is however connected to higher costs than in case if efficiency parameters were already known at the very beginning of design works.

The given arguments imply that upon the enforcement of “prices” derived from quality standards of a selected environmental element, the economic effectiveness of allocated financial resources is not secured. On the other hand, the enforcement of these prices creates a precondition enabling the quality of a selected environmental element modified by the standard to be achieved. It means that “prices” help ensure environmental efficiency.

2.4 Bilateral Agreements

R. H. Coase tried to refute the neoclassical statement that externalities are a source of market failure and that they result in the need of state interventions. Coase claimed that market optimality is also practicable upon the existence of externalities. According to it, economic entities themselves are able to reach effective solutions by means of bilateral agreements (Coase, 1960).

In an effort to support his claim by an argument, Coase formulated a theorem, according to which externalities should be balanced in the form of compensations for damages. A precondition of the compensation for damages is the existence of clearly defined property rights and a legal framework of the compensation of damages regulated by state.

Suability of a property rights violation enables to initiate a direct negotiation between a polluter and an aggrieved. It results in the optimum internalisation of negative externalities, which is a precondition of optimum environmental resources usage according to Coase.

Coase admits that his theorem is only valid under limited conditions, i.e. when high transaction costs are not incurred in relation to the negotiation. This situation occurs, if the creation of a negative externality has been caused by several polluters. The existence of a balance between the interests

of polluters and the aggrieved itself, which can only rarely be achieved in practice, is also problematic.

2.5 Emissions Trading and Voluntary Tools

The idea characterising the nature of trading with emission rights is an effort to establish markets of environmental resources. Efforts to solve the given problem led to the establishment of property rights on emissions (emission rights). Their establishment runs as follows: regulation centre responsible for the quality of environment stipulates the amount of harmful substances emissions which can be released in the system of environment in a certain time without exceeding an emission standard. Maximum acceptable volume of emissions is divided among individual polluters, who thus acquire the emission right. In case a polluter reduces emissions in their company under the level acquired by means of their emission right, they can emit their right and sell the "increased emissions". On the contrary, if they emit more emissions than the amount corresponding to their allocated emission right, they have to buy their right to emit them. The price of an emission unit is set on the market, where entities with lower costs of reducing one ton of emissions than its price represent the offer side. The demand side is represented by entities whose costs are higher than the market-generated price of emission permission. The enforcement of this mechanism enables pollution reduction at the lowest costs.

The stimulus of the owners of emission permissions to reduce emissions in an extent greater than that for which they acquired the permission will last until their costs of the elimination of one emission unit reach the market price of one unit of emission permission.

It is necessary to realise that the activity of polluters aimed at emissions reduction is concurrently reflected in the increased offer of unused emission permissions, which subsequently results in their market price decrease. Long-term balance occurs following the balancing of costs related to emissions reduction by all polluters, while the equilibrium price of emission permission should equal the marginal costs of emissions reduction.

An advantage of emission permissions enforcement, besides the minimisation of issuers' costs, is also their environmental efficiency. Problems with environmental efficiency upon enforcing this tool can occur when issued emission permissions do not consider the consequences of imissions in the given area. In such cases, the creation of so called "hot spots" cannot be excluded. However, a positive feature of this tool is the fact that the fulfilment of environmental objective will also be achieved without information from individual issuers on the marginal costs of emissions reduction.

The functioning of the market with emission rights is affected by several factors, including:

- issuers' possibility to measure emissions with acceptable preciseness;
- the existence of environmental technologies enabling polluters to reduce emissions;
- market with several buyers and sellers, enabling transparent generating of the price of one unit of emissions;
- the ability of offices responsible for the monitoring of released emissions to monitor emissions, and the ability of offices responsible for the allocation of emission quotas to allocate them properly; and
- the existence of transparent market rules which need to be simple, clear and at low transaction costs.

The aforementioned factors have a significant impact on economic effectiveness as well as environmental efficiency of trades with emission permissions. If factors affecting market functioning have been fulfilled, the usage of trade permissions subsequently enables:

- the balancing of costs of environmental pollution reduction;
- the encouragement of technological changes oriented on environmental pollution reduction;
- the provision of a high level of environmental safety by means of stipulating a maximum limit of environmental pollution; and
- the achievement of flexibility in cases of distribution and redistribution effects.

However, situation when a business entity enters the market with emission permissions and increases their prices can occur upon the emission permissions enforcement. The fact that higher prices of emission permissions are unacceptable

for other interested persons in terms of costs can result in production stoppage or even relocation (Filip, 2011). Emission permissions can thus become a tool of competition elimination, respectively of restricting room for their expansion in the given area in future.

2.6 Voluntary Tools

Voluntary tools of environmental policy can be characterised as voluntary activities of polluters in the form of implemented measures to reduce environmental pollution. These tools are either oriented on products or processes.

Tools oriented on products enable buyers to obtain information on the quality of products and their environmental profile. Such tools include e.g. labelling of environmentally-friendly products, life cycle analysis, integrated manufacturing policy, eco-design and green public procurement (Kovač, 2013).

Tools oriented on processes are focused on process management in companies regarding the adoption of measures to reduce environmental pollution. These tools include the environmental management system, environmental management and audit system, environmental audit, environmental accounting, environmental profile evaluation, cleaner production and voluntary agreements.

Exemptions from environmental tax or its reductions are possible upon voluntary agreements implementation. Advantages resulting from voluntary agreements implementation are significant for business sphere, as room is created for a greater flexibility upon environmental objectives fulfilment

compared to the enforcement of other environmental policy tools.

However, voluntary agreements implementation has a negative impact on revenues resulting from the collection of environmental tax, which private sector thus has at disposal. Public sector thus waives revenues resulting from the environmental tax collection and subsequent possibility of its usage to ensure environmental objectives.

3 CONCLUSION

Enforced environmental policy tools enable to influence the behaviour of economic entities. Following the way the behaviour is influenced, we can deal with direct and indirect environmental policy tools. The most frequent direct tools include norms - standards. Besides environmental problems solution, the issues of economic effectiveness and environmental efficiency of environmental quality standards are important upon their establishment. A negative feature of their enforcement is that they are static and little stimulating. It is common that technical progress implementation in standards is reflected with time delays. Another disadvantage of standards is that their enforcement does not result in the minimisation of national economic costs of reducing one emission unit. This deficiency can be solved by imposing environmental taxes as well as trading with emissions, which will be more and more significant in near future due to the need of minimisation of costs exerted to protect environment.

Enforcing voluntary tools of environmental behaviour, entities observe the intention to increase their environmental profile as well as to generate environmental and economic effects.

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METR MODEL FOR MEASURING TAX BURDEN ON INVESTMENT IN UKRAINE

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Abstract

Taxation is one of the most important determinants of investment. It has a major impact on the cost of capital and the expected net revenue from a given investment. Moreover, different tax burdens distort investment allocation. Recognizing the importance of these effects, this study tries to identify the tax induced distortions associated with the current system of taxation, and to find out which tax incentives are the most important for inducing investments in Ukraine. The study attempts to measure the real tax burden on capital investment by using the marginal effective tax rate (METR) as a quantitative indicator. The research includes both general and selective tax incentives, drawing high attention to the incentives acting through the system of corporate income taxation. The calculations are divided into two main parts: the first part - with due regard to general tax provisions (CIT – corporate income tax rate, treatment of dividends, capital recovery incentives, and import duty); the second one – with widening METR calculation by taking into account selective investment tax incentives (tax holidays, investment tax credits, preferential CIT rates). The paper also examines whether general or selective tax incentives' implication changes the results of calculations.

Keywords: corporate income tax rate, CIT, investment incentives, marginal effective tax rate, METR, tax burden on capital investments, real rates of return before and after tax, general and selective investment tax incentives

1. INTRODUCTION

The most important changes in tax system, fixed in the Tax Code of Ukraine, which came into force on 01.01.2011, concern the mechanisms for

encouraging investment and innovation activities of enterprises. The mechanisms should motivate taxpayers to modernize their industrial and technological base by increasing their own investment resources and by attracting foreign direct investments.

Most tax incentives with the longest period of validity were established within corporate tax

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system. Lowering statutory corporate income tax (CIT) rate is one of the least distorting forms of investment incentives. It is largely due to the fact that the statutory rate applies uniformly to all profitable business activities (so, without biasing the allocation of capital, the form of financing, etc.). This type of tax measure is administrative simple, since no complexity is added to the system of tax monitoring and tax administration. Lowering standard tax rate is a transparent measure that reduces the incentives for abusive tax planning.

Nevertheless, the measure has an important drawback – its effect relative to the revenue loss. This is because the tax relief falls on all

businesses, regardless of their willing to undertake new investments.

In Ukraine, the nominal CIT rate was reduced in 2004 (from 30 to 25%), in 2011 (from 25 to 23%), in 2012 (from 23 to 21%), in 2013 (from 21 to 19%), and in 2014 (from 19 to 18%), and a further decline is planned for 2015-2016 (17 to 16%). Due to the decline, in 2012 Ukraine was positioned as one of the countries with the lowest marginal effective tax rate (METR) for capital investment. For instance, according to the calculations of D. Chen and J. Mintz (2012), decline of CIT rate during 2011-2012, by two points per year, from 25% to 21%, combined with generous depreciation allowance, yielded a very low METR on investment in fixed assets of 6%.

Table 1. Marginal effective tax rate on capital investment in some countries, 2012 vs. 2005

	Marginal Effective Tax Rate		METR ranking in descending order		Statutory Company Income Tax Rate		
	2012	2005	2012	2005	2012	2005	+-% point
Argentina	43.2	43.2	1	3	35.0	35.0	0.0
India	33.5	37.8	6	6	32.45	36.6	-4.1
Colombia	33.4	26.3	7	23	33.0	35.0	-2.0
Brazil	31.6	35.1	8	11	34.0	34.0	0.0
Japan	30.4	31.9	9	16	36.8	39.5	-2.7
UK	26.7	29.7	14	19	24.0	30.0	-6.0
Germany	24.6	34.2	21	13	30.2	38.9	-8.7
Poland	14.5	14.5	55	72	19.0	19.0	0.0
Ukraine	5.6	7.5	87	86	21.0	25.0	-4.0

Source: Duanjie Chen and Jack Mintz (2012, p. 9)

Though, results of the study by D. Chen and J. Mintz do not correspond to the statistics of inflow of foreign direct investments in Ukraine. E.g., among the countries that, according to the calculation of marginal tax rates, were specified in the top ten with the highest burden on investments, had much higher absolute figures of foreign direct investments. As shown in the schedule, Argentina, India, Colombia, Brazil (which have a high estimated tax burden on investment and occupy respectively the 1st, 6th, 7th and 8th places in the top ten) run ahead of Ukraine by the level of investment, despite the fact that Ukraine occupies 87th place by severity

of burden among the 90 countries surveyed by D. Chen and J. Mintz.

Furthermore, other studies of the tax burden on capital investment indicate, that Ukraine has one of the highest effective tax rates in Europe. For example, according to the study of changes in corporate taxation in developing countries, conducted by S. M. Ali Abbas and Alexander Klemm, with Sukhmani Bedi and Junhyung Park (2012), due to the reduction of CIT in 2004, corporate effective tax rates in Ukraine has decreased. But both the initial effective tax rate and the reduced one, were high: 41.9% and 32.7% for METR before and after the reduction.

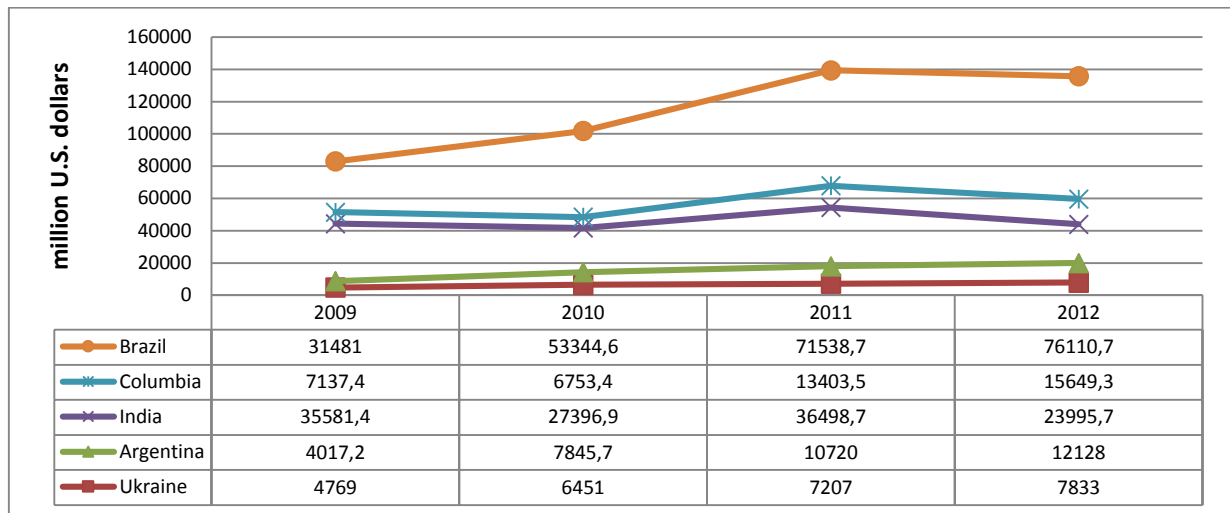


Figure 1. The amount of foreign direct investments in some countries during 2009-2012

Source: The World Bank

Table 2. Episodes of large effective tax rate changes in Ukraine (ln%age points)

	Start year	Duration	+/-	Start level	End level
EATR	2004	1	-9.5	40.3	30.7
METR	2004	1	-9.2	41.9	32.7

Source: S. M. Ali Abbas et al. (2012).

After a decline of the nominal rate and corresponding reduction of effective rates in 2004, the level of corporate taxation in Ukraine continued its growth. According to estimates of the Association of Separate and Independent Accounting and Consulting Firms (AGN International, 2008) in 2008 the effective corporate tax rate increased significantly - to 42%.

Considering that the results of studies on tax impact on capital investments in Ukraine differ significantly, we have conducted our own calculations in order to highlight the main issues for investment tax burden analysis in Ukraine.

2. METR AS A TOOL FOR ANALYZING TAX BURDEN ON INVESTMENTS IN UKRAINE

Changes in the statutory tax rate only partially shows the extent to which the tax system influences the rate of return and affects the allocation of capital. This is because tax burden on any type of business activity is influenced by many other factors: exemptions, deductions,

exclusions, allowances, and credits, and also the nature of the investment itself (internal or external type of financing).

Measuring the tax burden on investment is a difficult task. In the literature, the dominating concept is the effective marginal tax rate measure introduced by King and Fullerton (1984). On the basis of statutory tax rates and tax bases, King and Fullerton consider a permanent increase in the capital stock of a representative firm and calculate the tax burden on the basis of the difference between the rate of return of the marginal investment and the return required by the investor. Therefore, METRs measure the extent to which the tax system reduces the real rate of return on investment, at the margin.

Their methodology has further been applied by Dunn and Pellechio (1990) who developed the Marginal Effective Tax Rate model for their survey work on the taxation of business income in developing countries. They have represented a very useful and valuable tool to calculate effective tax rates for a variety of tax policies, types of investments and tax incentives.

Useful discussions of the METR can be found in Chua (1995); Shah (1995); OECD (2000); Zee, Stotsky and Ley (2002). Gordon, Kalambokidis and Slemrod (2003) have suggested another measure of the marginal tax burden on investment. The difference to King and Fullerton (1984) is that this new measure is a backward looking concept. Under certain assumptions it can be shown that the depreciation deductions in one period can be used to approximate the future deductions of the investment project under consideration. However, due to its strict assumptions this new measure has several shortcomings when applied to real world data.

The analysis in this paper includes the exploration of the main idea of the Dunn and Pellechio Marginal Effective Tax Rate model. The model is based on assuming a hypothetical project with a particular internal, before-taxes, rate of return. METR generates a cash flow for the project. Given the appropriate information on tax policy, the model applies this information to the cash flow and derives the internal rate of return for the after-tax cash flow. The effective tax rate (ETR) is the difference between the before and after-tax rates of return expressed as a percentage of the before-tax rate of return. On the basis of this idea, we develop a method of evaluating the tax burden on investments and correcting them for errors due to tax law complexities. The most important purpose of this paper is to apply our method to Ukrainian balance sheet data.

METR is a measure that shows the extent to which the tax system reduces the rate of return on investment, taking into account not only statutory tax rate, but other technical parameters of the tax system: investment incentives, loss carry forward and carry back for income tax purpose, capital gains taxation etc.

The definition of "tax incentives" encompass both general and selective incentives, it should cover both direct and indirect tax measures. Tax incentives should be included in the METR model as a set of tools: low statutory tax rates, preferential tax rates, tax holidays, capital recovery incentives - accelerated depreciation and initial capital allowances, investment tax credits, treatment of dividends, extra deductions, and also indirect tax incentives (export incentives,

reduced import duty on capital goods and raw materials, etc.).

The research includes both general and selective tax incentives, drawing high attention to the incentives acting through the system of corporate income taxation. The calculations are divided into two main parts: 1) METR calculation with due regard to general tax provisions (CIT rate, treatment of dividends, capital recovery incentives, and import duty); 2) widening the METR calculation by taking into account selective investment tax incentives (tax holidays, investment tax credits, preferential CIT rates).

2.1. METR calculation for general investment tax incentives in Ukraine

The model of tax burden on investment in Ukraine should include tax parameters that are the core factors affecting investment decisions. We propose that the general calculations include such tax factors: statutory CIT rate, withholding tax, import duty on capital goods, and annual capital allowance.

Though the METR measures the extent to which the tax system reduces the real rate of return on investment, at the margin, it can be expressed as follows:

$$METR = \frac{(RORbT - RORaT)}{RORbT} * 100\%$$

where:

RORbT and RORaT are the real rates of return before and after tax.

To simplify the data problems, we have constructed representative examples of investment projects that conclude basic data (general tax parameters).

For Ukraine, the CIT rate is 18%, withholding tax is 15%; average dividend payout ratio is 30%. We have calculated three scenarios for different import duties: 0%, 5%, and 10%. It is important to note, that the calculation is made only for internal sources of financing.

Table 3. Marginal effective tax rates for general tax parameters

	25% capital allowances			50% capital allowances		
	10% import duty	5% import duty	0 % import duty	10% import duty	5% import duty	0% import duty
100% dividend reinvestment	96.6	83.5	73.5	39.5	38.1	36.8
50% dividend reinvestment	151.4	130.9	115.2	61.9	59.7	57.6
0% dividend reinvestment	206.2	178.2	156.9	84.3	81.3	78.5

As tax burden on investment is influenced not only by tax conditions, but also by the structure of financial sources and types of assets (rates of depreciation/amortization), the calculation divides onto three options of dividend reinvestment (full capitalization, 50/50, and none), and the number of possible scenarios increase due to the inclusion of different capital allowance rates in the analysis. Though capital allowances reduce the user cost of capital, we considered two arbitrary options for capital depreciation: the first year

deduction of costs is 25% and the first year deduction of costs is 50%. We also considered the effect of the "capital allowance tax shield".

The significance of the results is in evaluation of relative efficiency of fiscal policy measures, in particular investment tax incentives. The lowest marginal effective tax rate of new investment accounts for a scenario with zero import duty, full dividend reinvestment and, what's most importantly, - high capital allowance rate - 50%.

Table 4. Marginal effective tax rates for general tax parameters, course of calculation

Import duty	Distributed profit (in the form of dividends)	Net income	UCC	UCC 25% depreciation	UCC 50% depreciation	25% depreciation tax shield	50% depreciation tax shield	UCC after tax, 25% depreciation	UCC after tax, 50% depreciation	METR, 25% depreciation	METR, 50% depreciation
0.1	0.0	0.7831	1.1	0.275	0.55	0.04950	0.099	0.7755	0.451	96.61	39.51
0.1	0.123	0.6601	1.1	0.275	0.55	0.04950	0.099	0.7755	0.451	151.40	61.91
0.1	0.246	0.5371	1.1	0.275	0.55	0.04950	0.099	0.7755	0.451	206.19	84.32
0.05	0.0	0.7831	1.05	0.2625	0.525	0.04725	0.0945	0.74025	0.4305	83.50	38.09
0.05	0.123	0.6601	1.05	0.2625	0.525	0.04725	0.0945	0.74025	0.4305	130.86	59.68
0.05	0.246	0.5371	1.05	0.2625	0.525	0.04725	0.0945	0.74025	0.4305	178.21	81.28
0.0	0.0	0.7831	1.0	0.25	0.5	0.04500	0.09	0.705	0.41	73.53	36.76
0.0	0.123	0.6601	1.0	0.25	0.5	0.04500	0.09	0.705	0.41	115.22	57.61
0.0	0.246	0.5371	1.0	0.25	0.5	0.04500	0.09	0.705	0.41	156.92	78.46

As one can see, a scenario with zero import duty, full dividend reinvestment and 50% capital allowance rate has the lowest METR – 36.76%. The return on investment ratio in this scenario is

0.5371, and user cost of capital (UCC) after tax is 0.41. In this case, the tax rules are investment inductive.

In contrast to the mentioned scenario, the scenario which takes into account 25% capital allowance is inefficient from investors' perspectives, as METR is the highest. Thus, when capital allowance rate is 25%, and import duty is 10%, the return on investment ratio varies within 0.54 – 0.78 (depending on the dividend reinvestment ratio), and the cost of capital is 0.78. Thus, the ratio "return on investment-to-the cost of capital" varies from 0.69 to 1.0, i.e. the effect of the tax system leads to the reduction of income by 31 to 100%, and capital allowances allow to write off only 22% of user cost of capital during the first year of investment (UCC after tax is 0.78).

Therefore, the METR model used for the assessment of relative effect of taxes and depreciation on corporate investments allows us to draw conclusions about the close dependence of the rate of return on investment and: 1) tax rules; 2) depreciation of capital; 3) the distribution of income. The calculations show that tax policy imposes a strong bias on investment patterns even in the absence of selective tax incentives.

It is obvious, that the greatest impact on METR has depreciation (capital allowance). It opens a question of effectiveness of CIT lowering, introduced by the Tax Code. Would it be more effective to leave the old tax rate 25 per cent, and, in same time, introduce the reduced rate, say 10 per cent, for companies-investors? Especially taking into account, that flat reduction of the standard CIT (from 25 to 18 per cent in 2014) leads to revenue loss. In my opinion, based particularly on the METR calculations, it would be more efficient (from the point of investment activity) to leave 25 per cent standard CIT, and to introduce the reduced one, that would be applied to companies, undertaking investments. That means that introduction of differentiated tax rates would have greater effect on investment activities.

2.2. METR calculation for selective investment tax incentives in Ukraine

The tax burden can be reduced in two ways: by making the general tax system more attractive, or by offering selective incentives. There are some important notes on selective tax incentives:

selective incentives require screening procedures, which can create significant administrative costs and delays; to ensure accountability, full and prompt public disclosure should be a firm requirement for any system of selective tax incentives; selective tax breaks (if used) should narrowly focus on activities that are likely to deliver high payoff in terms of policy goals, and which would not be undertaken without special incentives. Furthermore, any selective screening process can be subverted by political maneuvering.

Among the most common selective tax incentives (in terms of type of industry or business), undertaken in Ukraine are: tax holidays, investment tax credits and preferential tax rates.

Due to the provision of corporate tax incentives, the revenue loss in 2011 increased more than 7 times: from 2 billion UAH in 2010 to 15.4 billion UAH in 2011, and remained significant in 2012, - 5.1 billion UAH. Accordingly, the size of income tax incentives as a share of budget expenditures has increased from 5.7% in 2010 to 26% and 31% in 2011-2012, respectively.

An observation of the tax incentives in Ukraine allows us to draw conclusions on the lack of investment and innovation targeting. In this regard, A. Sokolovska, T. Efimenko, I. Lunina, R. Balakin, V. Ziatkovskiy (2006) suggest ways to improve existing mechanisms for providing tax incentives, and also to enact a system of tax efficiency monitoring (by analyzing budget losses) (Sokolovska, 2011). However, the problem of assessment of investment tax incentives' efficiency remains unsolved, particularly taking into account the fact that the wearout level of capital equipment in Ukrainian industry is about 75%.

The METR model provides a measure for evaluating the extent to which various tax incentive packages improve the rate of return for representative investment projects, at the margin.

So, next off, we have extended the representative examples of investment projects by inclusion of tax incentives provided by the acting corporate income taxation system of Ukraine.

Table 5. Type and industry distribution of income tax incentives, operating during 2011-2012

Type of investment tax incentive	What does the incentive provide?	Industry/services
Tax Holidays	Income from operations is exempt from corporate income taxation	Energy production
-x Holidays	Income from domestic production of book products, except erotic production, is exempt from corporate income taxation.	Publishing activities
Tax Holidays	Income from operations is exempt from corporate income taxation (except businesses working with customer-supplied raw materials).	Consumer goods industry
Tax Holidays	Income from core industry operations, and R&D operations are exempt from corporate income taxation.	Aircraft industry
Tax Holidays	Corporate income tax relief falls on: income earned by domestic manufacturers of device, machinery, and equipment, if the device, machinery, and equipment are designed to produce and reconstruct technical and conveying equipment (including self-powered agricultural machinery and powerplants) that expend biofuel.	Machinery manufacturing
Investment tax credit	80% of income earned from sales of own-produced goods on Ukrainian customs territory is exempt from corporate income taxation: renewable energy-fired equipment; materials, raw materials, equipment and complete units, used for energy production from renewable sources; energy efficient equipment, materials, products, operation of which provides economizing and rational use of energy resources; means for measurement, control and management of fuels and energy resources costs; equipment for alternative fuels production.	Food and pharmaceutical, machinery processing industries
Tax Holidays	Income from operations is exempt from corporate income taxation.	Shipbuilding industry
Tax Holidays	Income from operations is exempt from corporate income taxation.	Machine manufacturing for agricultural sector
Investment tax credit	Funds or cost of property, possessed by film producers and/or animation producers, that are used for production of national films, are excluded from taxable income.	Film production
Tax Holidays	Income from sales of biofuel is exempt from corporate income taxation.	Biofuel production
Tax Holidays	Income from hotel services provision is exempt from corporate income taxation (five star, four star and three star hotels, new and rebuild or reconstructed) if income earned by the entrepreneur from accommodation services comes up to at least 75% of total income earned during taxable period in which tax relief is in force.	Hotel business
Preferential tax rate	From 01.01.2013 until 01.01.2023 for IT-industry entrepreneurs 5% CIT rate is set.	IT industry

Source: Ministry of Revenue and Duties of Ukraine

Table 6. Marginal effective tax rates for investment tax incentives

	Dividend reinvestment rate	25% capital allowances			50% capital allowances		
		10% import duty	5% import duty	0% import duty	10% import duty	5% import duty	0% import duty
Tax holidays, 0% CIT rate	100%	25.7	21.2	18.0	10.0	9.5	9.0
	50%	111.4	91.7	78.0	43.3	41.0	39.0
	0%	197.1	162.3	138.0	76.7	72.6	69.0
Investment tax credit, 80% of income is excluded from tax base	100%	42.9	35.7	30.6	16.9	16.1	15.3
	50%	121.1	100.9	86.5	47.7	45.3	43.2
	0%	199.3	166.1	142.3	78.5	74.6	71.1
Preferential tax rate, 5% CIT rate	100%	49.1	41.1	35.3	19.4	18.5	17.7
	50%	124.6	104.3	89.6	49.2	46.9	44.8
	0%	200.1	167.4	143.9	79.1	75.4	72.0

In the extended calculation, the basic data (general tax parameters) are held constant (the CIT rate is 18%, withholding tax is 15%; dividend payout ratio is 30%) while other factors that affect the METR (investment tax incentives) are changeable: tax holidays, investment tax credit, and preferential tax rate. Though, the changeable factors that have constructed the calculation, include: 5% preferential CIT rate, 0% CIT rate (tax holidays), and the exclusion of 80% of corporate income from the tax base. As tax burden on investment is influenced not only by tax conditions, but also by the structure of financial sources and types of assets, the calculation includes three options of dividend reinvestment (full capitalization, 50/50, and none), and two options for capital allowance rates (25 and 50%).

Using this approach, one can isolate the impact of various factors by holding constant other factors that affect the METR. The examples are constructed to provide information needed to calculate rates of return before and after taxes. This approach can be used for analyzing tax systems across countries.

The METR calculation for investment tax incentives allows us to draw some conclusions: 1) the most effective tax instrument for lowering METR on new investment in Ukraine is tax holidays (it can provide the lowest METR of 9%), but it should be noted that tax holidays are time-

limited; 2) the investment tax credit is more effective instrument for lowering tax burden on investments than the preferential tax rate (METR for investment tax credit, under full capitalization, is 15.3-42.9%, and for the preferential tax rate – 17.7-49.1%).

3. METR FOR NON-PRODUCTIVE ASSETS IN UKRAINE

The results of our empirical analysis suggest that the accuracy of indicators varies considerably across firms. We investigate the factors explaining the differences across firms and find that tax depreciation is unexpectedly low in firms with a high share of non-productive assets.

That is why it is important to evaluate the impact of capital allowance on marginal tax rates, when it comes to non-productive assets. In terms of investment, non-productive assets are less attractive: tax credit on VAT cannot be charged, what is more - non-productive assets are not charged to tax depreciation which means the tax shield does not work.

The table represents the results of calculations for two types of assets – productive and non-productive, under different depreciation charging rates: 25 and 50%. Furthermore we have taken 20% VAT into the account.

Table 7. Marginal effective tax rates for investments in productive and non-productive assets

		25% capital allowances	50% capital allowances
Investments in non-productive assets	100 % dividend reinvestment	216.9	54.2
	50 % dividend reinvestment	340.0	85.0
	0 % dividend reinvestment	463.0	115.7
Investments in productive assets	100 % dividend reinvestment	73.5	38.0
	50 % dividend reinvestment	115.2	59.0
	0 % dividend reinvestment	156.9	80.5

It is obvious that there is essential difference in the tax burden on investments, depending on the type of activity. For example, the company, which accounted for the balance of a large mass of non-productive assets (energy, transport, telecommunications) will experience higher tax burden on investment resources, than those

companies that do not hold such assets. Therefore, even if different companies are subjects to the same basic and selective tax incentives, the tax burden on investments undertaken by such companies will vary, depending on the type of assets in which the companies invest.

For this reason, as a rule, investment in non-productive assets (acquisition, construction and improvement of such assets), which include roads, utilities and telecommunications, social infrastructure, are often carried out by the state. As shown in I. Lunina (2011), Ukraine, in terms of cost of investments in fixed assets, ranks last among post-socialist countries.

Therefore, in our view, the main task of implementing investment tax incentives in Ukraine concerns the growth of investment in material and social infrastructure: communications and telecommunications, energy and social field.

The main problem, however, is that there is no “good” criteria of stimulating efficient projects that would not be undertaken in the absence of special incentives. As Krugman (1983) concluded from his review of “popular criteria” for targeting industrial promotion policies, it is very difficult for governments to “devise criteria...which will by and large pick the right industries,” or establish procedures that will not be driven by political interests rather than genuine economic benefits. So, we still have much to be done.

4. CONCLUSIONS

The basic conclusion is that the analysis based on the METR model is an effective mean of assessing the tax wedge caused by both general and selective tax incentives. However, it should be noted that this estimate as any other, cannot answer the question of how investment flows will change as a result of the use of certain tax incentives. If non-tax elements of the investment climate are in poor shape, there may be few investments forthcoming even if the METR is very

low. On the other hand, high METR rates may not have a significant effect on investment in activities with very favorable conditions, such as oil projects. In other circumstances, many investors consider projects where expected returns are close to the hurdle rate; if so, then a high METR will cut them out, and a low METR will bring them in.

Another feature of the analysis based on the METR model is that the model can not incorporate features of tax laws. If the tax administration is arbitrary, ineffective or corrupt, if entities are looking for ways to use investment incentives in order to reduce the tax burden on the operating or financial performance, the official tax instruments included in the analysis, may be uninformative; than the METR analysis does not reveal much about the effect of the tax system on investment incentives.

Tax incentives may be a useful tool for stimulating productive investment, research and development, and training. But they must be carefully designed and well administered so as to avoid side-effects that diminish productivity by distorting resource allocation, sustaining inefficient or unsustainable activities, and losing revenue needed for other components of the productivity package.

For Ukraine, a kit of analytical tools that can be used in analyzing the effectiveness and impact of tax incentive programs, should be developed. The tool kit should include not only a model for evaluating the marginal effective tax rates, but also: information systems for monitoring effective tax rates; guidelines for monitoring tax expenditures; and guidelines for screening applicants for selective discretionary incentives.

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OPPORTUNITIES FOR ECONOMIC DEVELOPMENT OF BULGARIA THROUGH PUBLIC PRIVATE PARTNERSHIP

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Abstract

The paper discusses the development of public- private partnership as necessary and required form of cooperation between public authorities and private sector. The positive and negative aspects of the public-private partnership for the development of Bulgaria will be determined. An analysis will identify the opportunities and threats of public-private partnership development by attracting funds from private partners/investors.

The financing through public-private partnership allows the implementation of holistic approach to design, financing, construction and operation, emphasizing on the invested from it funds in the whole project cycle.

This type of financing publicly-state owned projects allows using private resources in infrastructure project realization. This results in most cases in following the pre-set budget and timeframes for project construction. The capacity and experience of the private partner, which can be used in infrastructure project realization, are of crucial importance for the financial sustainability and development of the project.

Keywords: public-private partnership, infrastructure, financing, private partner

1. INTRODUCTION

The public-private partnership is one of the financial instruments that successfully ensures investments in the infrastructure, which is publicly-state owned.

Financial gap in the state and municipal budgets results in the need to seek alternative forms of country development.

The definition that the public-private partnership is cooperation between the public and private sector in order to implement investment project or service, traditionally provided by the public sector, is generally accepted (Metodicheski ukazaniJa za publichno-chastno partnyorstvo, Ministerstvo na

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The public-private partnership allows the application of innovative methods for structuring and financing investment projects and ensures investments for developing basic infrastructure for providing qualitative public services in the country.

Recently the development of public-private partnership in Europe is stimulated by the accelerated regional development of the common European market.

This in turn will result in the need of development of transport, environmental and social infrastructure that meets the growing needs.

The combination of these needs with the adopted European Directives in the field of environment and transport will result in necessity of big investments in this basic infrastructure.

The possibility for achieving a better value of the invested public funds by using the effectiveness and efficiency of the private sector in providing public services is recognized.

On the other hand the applied strict monetary and fiscal policy imposes restrictions on the consolidated budget.

The financing through public-private partnership allows the implementation of holistic approach to design, financing, construction and operation, emphasizing on the invested from it funds in the whole project cycle.

2. ANALYSIS

It has to be mentioned that public-private partnership allows sharing project risks between public and private partners.

Traditional infrastructure financing can be summarized mainly as state obligations for implementing periodic payments to hired contractor during construction phase of the infrastructure project.

After the construction works the state is committed to the operation and maintenance of the built infrastructure. In this type of financing the main burden is for the state as it takes all risks

during the project realization and infrastructure operation.

The practice shows that frequently when we have traditional financing the forecasted construction price is by far exceeded and making an assessment of the state expenditures on the operation and maintenance of the infrastructure is hardly feasible.

Therefore the financing through public-private partnership is appropriate form for applying holistic approach to design, construction and operation of infrastructure project.

The value of the invested funds during the whole project cycle is important for the financing of infrastructure project through public-private partnership.

This is the reason the state to compare not the value of the infrastructure construction, but the total expenditures for providing the desired service, in assessing the opportunities for implementing public-private partnership.

Another major difference with the traditional financing is that when we have public-private partnership the payments of the state are due when the desired service is received in the desired volume and quality, i.e. there are no financial liabilities during the construction phase of the infrastructure.

Very important advantage of the public-private partnership is the possibility for balance of risk taking between partners. In terms of financing the project, this means that the state can transfer all risks, associated with financing, construction, maintenance and operation of the infrastructure project, to the private partner and share only the risk for provided service demand.

This type of financing publicly-state owned projects allows using private resources in infrastructure project realization. This results in most cases in following the pre-set budget and timeframes for project construction.

The capacity and experience of the private partner, which can be used in infrastructure project realization, are of crucial importance for the financial sustainability and development of the project.

The public-private partnership includes different forms of cooperation: leasing, franchise, concession, management contract, BOT (Build-Operate-Transfer), BOOT (Build-Own-Operate-Transfer), DBFO (Design, Build, Finance & Operate), DCMF (Design-Construct-Manage-Finance), joint venture, etc. (Boeva & Vasileva, 2008)

The public-private partnership is one of the key elements of the modern business, due to the benefits it provides, namely the interesting way of financing and providing investments in the public infrastructure.

This defines the role of the public-private partnership as a source for public goods provision.

The provision of more accessible service of better quality whilst implementing the contract strictly and on schedule may be indicated as positive effect in project implementation through public-private partnership.

Giving the option of project risk-taking is exceptional strength, since all risks have their value and thus the public sector may transfer significant expenditures to the private sector.

This approach is particularly topical and applicable for the Transport sector.

The public-private partnership allows the development of major infrastructure projects without significant start-up investment costs with funding from the budget, which in turn ensures improved public infrastructure.

To have successful project implementation through public-private partnership requires taking into consideration important and particularly necessary for the successful business indicators, namely the presence of equality between the partners and absolute transparency of all actions to limit corruption.

The efficiency of project implementation through public-private partnership depends on both the political and public support and the availability of legislative frame suitable for applying models for public-private partnership and different ways for project funding.

In order to guarantee the qualitative and beneficial implementation of projects through

public-private partnership is required the procedures to be transparent and open thus resulting in reducing to an absolute minimum the possibilities for misappropriations.

The projects implementation through public-private partnership creates options for conflict of interests, because the municipalities' government in Bulgaria is carried out by different political parties, lobbying for certain companies.

The maximum effect for the population of certain municipality is not always achieved since the process of project implementation through public-private partnership can be very expensive and long. There is a need of highly qualified specialists for preparation and implementation of procedures, associated to the public-private partnership.

Recently the economic development of Bulgaria is low due to stagnation of economy, privatization and lack of financial resources for realization of economic policy.

The way out of this situation is attracting funds from private partners and creating public-private partnership between the public and private sector for implementing certain project or service in public sector.

Such an arrangement can be realized in the construction of highways and railways, in the reconstruction, management and maintenance of infrastructure, as the public and private sector share expenditures, profit and risk.

The public-private partnership in Bulgaria is used mainly for maintaining and developing transport infrastructure, mostly in roads, bridges and railways, garages, parking, etc.

An upward trend in public-private partnership in the sectors of waste management, water, health, etc is reported. The public-private partnership development through attracting financial resources from private partners offers opportunities as efficiency, innovative solutions, risk sharing, financing.

In times of financial and economic crisis our country cannot fully engage with financial resource for implementation of certain projects. This factor allows private business to be involved

as partner as cooperation in the form of public-private partnership is carried out.

Thus an attempt to overcome the scarcity of budget resources though attracting private capital is made.

Regarding the Bulgarian municipalities the application of public-private partnership is of key importance as the scarcity of public resources, caused by the crisis processes, increasingly limits the traditional funding of public services.

The public-private partnership creates conditions for stimulating and developing business by creating prerequisite for economic benefits via increasing employment and providing opportunities for economic growth and competition increase.

The competition in turn results in both innovations development and productivity increase.

The opportunities, provided by the public-private partnership can be directed towards project implementation and services provision in different economic spheres.

- Social Services
- Waste Management
- Transport Infrastructure
- Transport Network Maintenance
- Telecommunications
- Tourism
- Power Engineering
- Health Services
- Water Supply
- Public Works (urban infrastructure, landscape architecture, restoration of municipal buildings and monuments)
- Agriculture and forestry
- Consulting Services
- Civil Engineering
- Energy Efficiency
- Construction of Industrial Parks
- Education and Culture
- Sports
- Others: Zakon za publichno-chastnoto partnyorstvo (2013), Pravilnik za prilagane na Zakona za publichno-chastnoto partnyorstvo Priet s PMS # 6 (2013), Metodicheski ukazaniya za publichno-chastno partnyorstvo (2009)

In Bulgaria, the Public Private Partnership Law is in force since the beginning of 2013.

A restrictive approach has been adopted in the law in force as the activities, where public-private partnership projects can be realized are explicitly specified – technical infrastructure projects (parking, garages, public transport, surveillance and security systems, street lighting systems); social infrastructure projects (health services, education, culture, sports, social assistance); green system projects (green spaces, parks, gardens).

Currently different proposals for amendments in the law in force are introduced and the opportunities, offered by it are expanded, so that the benefits of public-private partnership are used constructively.

The success of the public-private partnership is highly dependent on local conditions (i.e. political risk, laws, experience, etc.).

Typical for Bulgaria is that most of the projects through public-private partnership are carried out in the sphere of environment and in particular in the field of waste management (39 %).

Then follow the projects in the field of power engineering – 25 %, as those in the areas of water supply, public works and social activities are third in the ranking, having 18 %.

The smallest number of realized public-private partnership projects is in the field of transport and cultural tourism (11 %) and telecommunication (7 %).

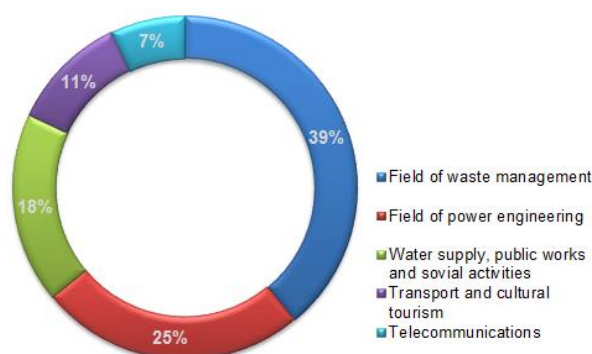


Fig. 1 Project of public-private partnership sectors

A modern infrastructure is a major stimulus for economic growth and raising the standard of living.

Our country in its process of economic development needs modern and alternative solutions in the field of public services and in the modernization of infrastructure projects and utilities.

The practice shows that the public-private partnership is successful financial instrument to ensure investments in the public infrastructure, when the State and public budgets do not have the resources and want to provide a better value of the invested public funds.

It is, in particular, essential to assess in advance whether the projects are appropriate for implementation through public-private partnership, considering the fact that the goal of the public-private projects is not just to build infrastructure or facility, but to provide certain service, which is of better quality or cheaper than realized by the state only.

On the other hand, there should be both a fair balance of risk taking and when the private investor incurs a larger risk in project implementation to receive a higher return on investments respectively.

Why is it recommended to use public-private partnership, especially in the current economic conditions?

The answer of this question can be summarized as a result of the analysis of the positive and negative aspects in project implementation through public-private projects, as follows:

- Ensuring additional allocations for funding;
- Using the expertise of private partners in project implementation;
- Offering additional benefits to the consumer and society via providing new, better and qualitative services;
- Optimal use of resources;
- Rational balance of risk-taking;
- Transparency and openness of procedures so that the project success in long run is ensured;
- Creating opportunities for business and employment.

When is it recommended to use public-private partnership as a form for project realization?

- If there is financial need when there is budget deficit;
- Poor state of the infrastructure;
- Looking for greater efficiency and innovation in project implementation;
- Competitiveness;
- Sustainability of the results in project implementation;
- If there is holistic approach to design, construction and operation of infrastructure project;
- Competency.

To ensure sustainability of the funding and operation, the option for implementing projects through public-private partnership is increasingly explored, which is promoted as a form of top-up of EU funds in the next programming period.

The role of the public-private partnership in Europe is gradually growing, but during economic crisis it is necessary to apply more flexible forms of cooperation between the state and the private partner – both in the implementation of projects and methods of funding.

3. CONCLUSIONS

In the economic conditions of our country development, the public-private partnership is an efficient solution of managing projects of public interest and may be considered as top priority for economic development.

Considering the national priorities, objective facts and primarily the resource limitations of the country, the public-private partnership is a certain perspective for Bulgaria.

The public-private partnership is a form of interaction between the public and private sector that still have a development ahead, following the best European practices and will contribute to the development of beautiful Bulgaria.

The public-private partnership provides considerable opportunities for development of Bulgaria, for improving its infrastructure and competitiveness.

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STRUCTURAL ANALYSIS OF PRINCIPAL THREATS TO ECONOMIC SECURITY OF THE REGION IN THE PROCESS OF EUROPEAN INTEGRATION

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Abstract

It was found that the threats of economic security are caused by changes in the external environment and internal elements of the operation region. Such destructive impact factors on the economic security of the region as - uncertainty, risk, danger, damage are identified and analyzed. It was established that the main threat to Ukraine is in the domestic sphere and it is determined by internal problems of socio-economic, political, legal, ethical, environmental, energy plan. Threats to economic security and their ranking according to the nature and extent of the possible destructive action are classified. Classification criteria of threats in the region to help in the analysis of probability prediction and control of negative consequences of existing threats to economic security are proposed, sources of hazards and the degree and extent of the negative impact are identified. Based on statistical data, the main threats to economic security of Ukraine are determined and analyzed, and also the relationship between threats to economic security of the region is established. A comprehensive analysis of existing threats to economic security led to the conclusion that they are a dynamic system of cause and effect relationships with a large number of reverse dependencies existence of which can greatly enhance the destructive effect of any specific threats to economic security. It is researched and proved that the combination of systemic effects of endogenous and exogenous risk of regional differentiation is a threat to economic development of the region and the national economy.

Keywords: economy, national economy, economy of the region, economic security, internal threats, external threats, destructive factors, economic security, region

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1. PROBLEM FORMULATION AND ITS LINK WITH IMPORTANT SCIENTIFIC OR PRACTICAL TASKS

European integration vector of socio-economic development envisages carrying out essential functional-structural and regulatory institutional changes. Modern European integration policy of Ukraine is formed under the conditions complicated by the influence of internal and external, objective and subjective factors of development. Among these are important issues of ensuring economic security of the region.

Studies of the problems of strengthening economic security of the state and the region are connected with the development of theoretical fundamentals of security, defining principal factors of threats, analysis of the state of economic security under the conditions of participation in the processes of global economic integration. A special emphasis is placed on the most essential characteristics of security based on the analysis of the factors of security, criteria for assessment of vulnerability of national economies, classification of threats to economic security and mechanisms of their localization.

According to Pirpiliu (2012, p. 88), "It has to be mentioned that not any economic problem represents a security problem and not all economic security problems represent national security problems. Defining an economic problem as a security one is not an easy process due to objective conditions- the development level of a state, etc but also due to subjective factors. No matter the level applied, trying to define the economic security implies notions non-quantifiable: perceptions, interests, values as it goes along "with one of the most ambiguous and heavy notions seen in the social sciences", the national security".

Analysis of social-economic development of the country shows that the causes of emergence of threats to economic security are of a regional nature. Growth of disproportions in the levels of social-economic development of different regions contributes to the emergence and further strengthening of negative processes in the economic sector, affecting stability of functioning

of the economy, sovereignty of the state. The situation is aggravated especially by the growth of social inequality of various strata of population of the regions that leads to disruption of social harmony in the country. State independence, security is largely dependent on the regional aspects and, therefore, it is important to study economic security of the region as a component of formation of national security of the state.

In general, we shall note that basically there is no clear approach to the establishment of economic security of the country so far in theoretical and methodological terms, and there are even more problems on the regional level (the minimal set of informative indicators, their threshold values have not been determined, methodological issues of organization of monitoring and decision making have not been resolved with respect to the prevention of threats to economic security, etc.). Any region under effects of general Ukrainian tendencies of social-economic development shows its characteristic problems connected with the formation and functioning of the security system that are determined by peculiarities of the territory itself, for example, by its geopolitical location, climatic conditions, availability of natural resources, by the structure of branches of industries, ethnic composition of population.

2. THE OBJECTIVE

The objective of this article is to substantiate interaction and impact of external and internal threats to economic security of the region in the process of European integration.

3. EXPOSITION OF THE MAIN MATERIAL OF THE STUDY

A range of scientific research works has been conducted on the issue of ensuring economic security of the country, region, and company for recent years. For instance, Neu & Wolf (1994) comment in regard to the US's national economic security the following: "High on the list of concerns is national economic security--the ability to protect or to advance economic interests in the face of circumstances that may threaten or block these interests. The United States is not economically isolated but an integral part of the world economy, doing business in world markets and influencing--

and being influenced by--the international financial environment, economic policies, and commercial and financial infrastructure". They note, that "enhancing international economic security

enhances U.S. economic security--and its physical security, because some situations can escalate to the point that they require a military response.

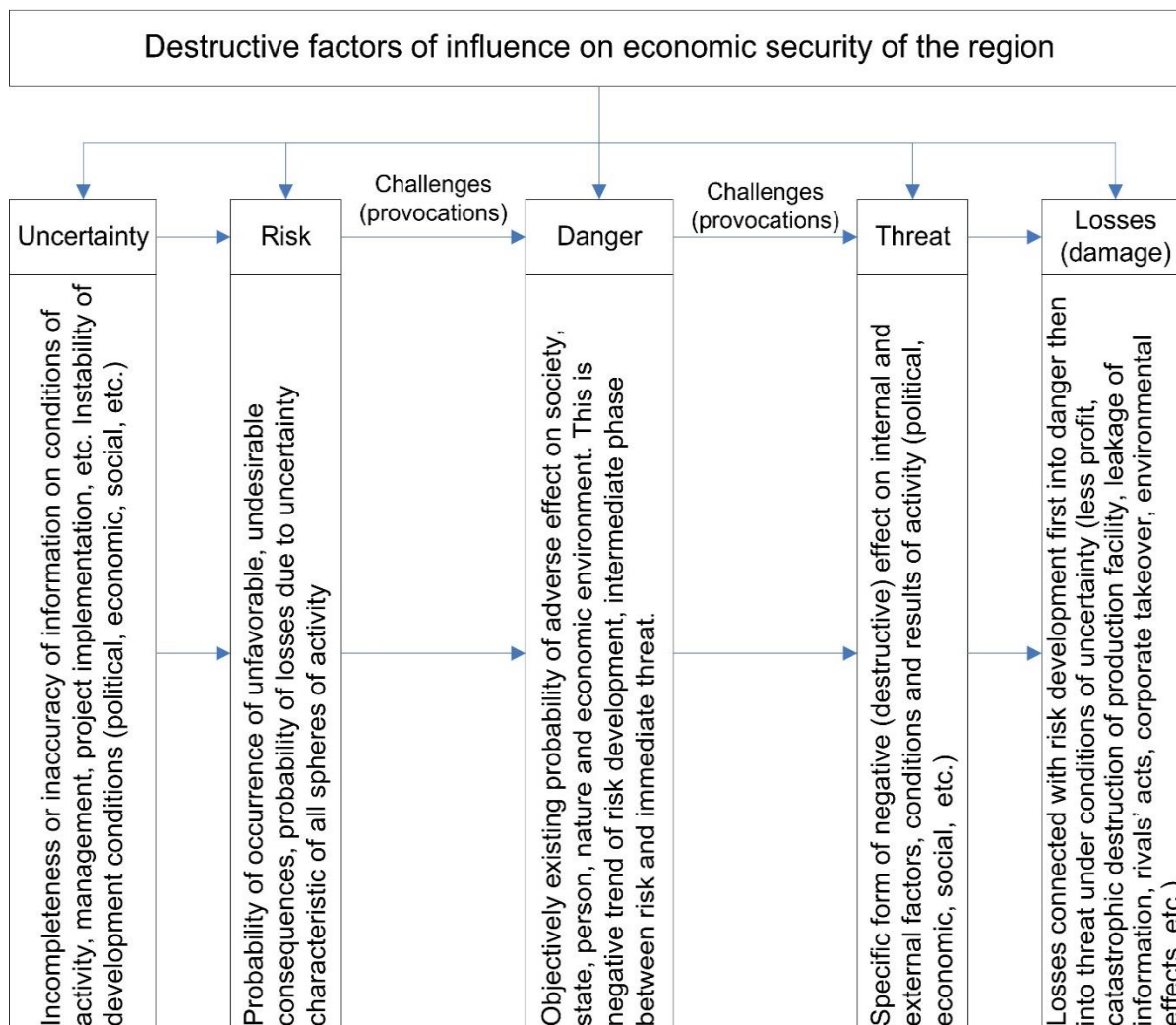


Fig.1. Destructive factors of influence on economic security of the region

A strong military to respond to such a threat requires strong economic underpinnings--and economic instruments can serve as a nonmilitary form of defense, even as defense considerations can affect the economy" (Neu & Wolf, 1994, p. 5). According to V. Tsookanov, a component of the security system is the mechanism of ensuring economic security which important structural element appears to be the necessity to determine the needs for economic security (Tsookanov, 2007, p. 37). The needs for economic security are influenced by a range of factors, objective and subjective, internal and external, predictable and unforeseen. In concentrated form, they can be

represented as destructive, which have an impact on economic security of the region. For this reason one should distinguish between the following categories: risk, danger, threat, losses (Fig. 1).

Risk in the above chronology of destructive factors is associated with uncertainty and probability of formation of a situation that creates a danger. Challenge is a provocative action or means of pressure, danger is a real possibility of inflicting losses, and threat is the intention to inflict losses. Risks may and should be modeled. Toma, Alexa, & Nistor (2013, p. 67) point out: "Risk modeling is fundamental in economic activities because it

offers and selects the appropriate policies and efficient techniques for risk management and because the risks and threats change over time, it is necessary for organizations to periodically reassess risks and reconsider whether the policies, decisions and control chosen are appropriate and effective". As V. K. Kuznetsov (2001, p. 43) notes, the category "risk" allows recognizing challenges specifically. Challenge is a desire of one state, a group of states to counteract against another state, a group of states in implementation of their national interests. Challenge in the sphere of national security is that what stimulates competition, contest, struggle (Gorbunin & Kaczynski, 2009, pp. 13-16, 19-39).

Osberg & Sharpe (2012) examine trends in the IEWB Economic Security Index for four affluent OECD countries and compare a cross-section of seventy rich and poor countries in 2007/08. In order to reflect better the reality of developing countries, the authors include the volatility of food production in the risk of loss of livelihood, adjust the risks of health care costs to consider the proportion of household spending on food, and add adult male mortality to the risk of divorce in calculation of the risk of single parent poverty in the index. Osberg & Sharpe (2014, p. S53) note that, "Worrying about possible future economic dangers subtracts from the present well-being of individuals, which is why affluent societies have complex systems of private insurance and public social protection to provide a degree of economic security". The authors also point out that such protections are largely unavailable to the citizens of poor nations. This helps us measure economic insecurity in very different contexts, including in the context of Ukrainian economic realities.

Another destructive factor of influence on economic security is danger. As V. P. Gorbunin (2005, pp. 39, 46, 50) notes, danger shows the possibility of occurrence of some conditions of technical, natural, economic or social nature, under which unfavorable events and processes can take place. For example, regional security is such a state of a particular region in which it, on the one hand, can withstand destabilizing influence of external and internal socio-economic threats, and on the other hand its functioning must not create socio-economic (financial, ecological,

demographic, interethnic, etc.) threats to elements of the region itself and its environment.

Assessing likelihood of occurrence of a particular situation, it is necessary to assess possible losses. Losses are actual or possible economic and social damages (declining health of humans from mean statistical indices, that is, diseases or even death of humans, disruption of the process of normal economic activity, loss of property, etc.) and/or deterioration of natural environment due to changes in the environment of man resulting from some events, phenomena and actions.

Along with uncertainty, challenge, risk, danger and losses, some of the basic notions of economic security are the threats that in the above hierarchy are placed between danger and losses. Emphasising the importance of the category "threat", Grigoreva & Fesina (2014, p. 642) say that "An important methodological issue in determining the essential-conceptual notion of "economic security" is the problem of the transition category "threat" to "danger." The concretization of this approach is due to the adoption of a special border line as a criterion for security, as an indication of the critical state of socio-economic system beyond which there is a threat or degradation and destruction of the system". According to the law of Ukraine "On National Security of Ukraine" (Zakon, 2003) the threats to security are understood to be the existing and potentially possible phenomena and factors that are perilous to vital national interests of Ukraine. Threats arise from the conflicts of economic interests of various elements that interact both, inside and outside the socio-economic system. They determine the content and trends of activity aiming at ensuring security. To substantiate specific and most important ways of strengthening economic security and identify forces that provide them it is important to distinguish modern dangers and threats. Threats to economic security are factors that render impossible or complicate the process of realization of national interests and endanger survival of the nation, its socio-economic and political system. Identifying threats and their elimination must be the priority elements of economic policy of the state. A threat can be represented as a system of risks in the state of their interaction in the process of the growth of

threats of destruction of the object or its separate parts.

Ukrainian scientist V. Predborsky identifies the following key economic threats to Ukraine: increasing structural deformation of the economy, decline of investment and innovation activity and the collapse of scientific-technological potential; tendency to transform Ukraine into fuel and raw material supplying periphery of the developed nations; growing dependence on import; outflow of foreign exchange resources from the country; deepening stratification of the society; high level of external and internal debt; excessive openness of the economy, criminalization of economic relations (Predborsky, 2005, p. 20).

We shall note, that structural analysis of the problems of economic security should be conducted taking into account interrelation of economic contradictions, risks and losses that may occur in the result of fulfillment of threats. Threats to economic security are divided into internal and external threats. It is difficult to present the mechanism of interaction of internal and external threats from the standpoint of geopolitical strategy and the globalization process. Internal threats are inability of the country to ensure its self-preservation and self-development, weakness of innovative character, ineffectiveness of state regulation of economy, inability to establish an optimal balance of interests and use the experience of solving social disputes and conflicts. Internal threats are generated by low capacity of the financial system to ensure reproduction (mutual non-payments, disruption of guaranteed budget funding, etc.) to serve public debt, etc.

A prolonged preservation of internal threats without an effective economic policy makes the country more vulnerable to external threats, playing a special role under present day conditions. The main reasons for their emergence are: rapid development of the process of transnationalization of economic relations, integration of national financial markets, and internationalization of world economy. These reasons are concentrated also in relative weakening of regulation of world financial markets (with the increase of their volumes and amounts of business, growing competition between them); expansion of global financial system through the

developing countries entering the world economy (increasing global instability); a steady increase of the volume of capitals, whose mobility (predetermined by the growing speed of transfer from one market to another) creates a tense situation.

The high level of concentration of financial resources on macroeconomic level (budget systems of states and international organizations) and on the level of interstate economic integration, including its financial and monetary component, tendency to concentrate capital or sub-governmental economic subjects possessing a considerable financial power, growth of their influence on the economy of separate countries (particularly on Ukraine); growing intensity of financial transactions, a high level of mobility and interrelation of financial markets (for example, a crisis that occurs in one market quickly spreads to other markets, and this can lead to unpredictable consequences for the entire world financial system) on the basis of the latest information technologies.

It is also necessary to take into account such reasons as interpenetration of domestic and foreign policies of the countries (including Ukraine as well), that are becoming increasingly dependent on global finance, increased competition between Ukraine and other countries in economic and other spheres (loss of sales markets, discrimination of Ukrainian commodity producers in the world markets); excessive dependence of national economies (in terms of budget sector) on foreign short-term speculative capital, that affects negatively their financial systems.

Threats to economic security are more variable, largely diversified, and not always predictable. Therefore, analyzing internal and external threats it is especially necessary to analyze unforeseen factors that determine possible threats. One of the important approaches to the analysis of threats is determination of "the scale of security priorities", classification and ranking of threats depending on their character and level of danger they represent. Such scholars as V. S. Gusev, V. A. Dyomin, and B. I. Kuzin (Gusev, Dyomin, & Kuzin, 2004, p. 21) offer the following classification attributes to threats:

- sphere of human activity (political, economic, social, legal, military, aggravation of interethnic relations, ecological, demographic, genetic, scientific-technical, technological, ideological, psychological, intellectual, information, raw materials related);
- source of threat (internal - source on the territory of Ukraine, external - source located abroad);
- relation to human activity (objective - formed regardless of target activity, subjective – created deliberately);
- probability of occurrence (real - can take place at any time; potential - in the case of certain conditions);
- depending on consequences (general – take place in entire Ukraine or in majority of its subjects, local - in some subjects).

The "scale of security priorities" may change depending on the specific situation, the character and level of threats. In particular, the main threat to Ukraine at present exists in the internal sphere and is determined by internal problems of socio-economic, political, legal, ethical, ecological, energy nature.

The basis of organization, planning and realization of practical steps to ensure economic security is analysis of the concept of threat, assessment of the nature of real and potential internal and external dangers and threats, crisis situations. The system of real and potential threats is not constant, sometimes threats may appear and disappear, may grow and may fail depending on the specific situation, while their effect on economic security will be changing accordingly. For example, the main threat to economic security of Ukraine in the internal sphere under the conditions of unstable development is determined by the internal problems of socio-economic, political-legal, ecological development, etc.

Systematized classification of threats to economic security and their ranking depending on the character and level of possible destructive effect is presented in Fig. 2. According to the classification of threats to economic security there are distinguished, first of all, the spheres (sources)

of emergence of threats. The main internal threats to Ukraine and its regions are:

1. Level of competitiveness of products produced in the country as the most objective integral criterion of viability of the state.
2. Low levels of manufacture of exports, loss of markets for machine-building products.
3. Criminalization of the private and public sectors of economy.
4. Under the conditions of imperfect applicable laws, absence of effective independent judicial system, corruption on all levels of power, redistribution of property takes place, which is characterized by the fact that it applies not only administrative pressure, but also possibilities of dual interpretation of applicable laws.
5. Development of "shadow" and informal sectors of economy of Ukraine.
6. Ineffective investment and innovation activity of potential Ukrainian investors, growth of capital investments in commercial, intermediate trade and financial activity to the detriment of manufacturing business.
7. Instability of production-economic situation triggers emergence of internal threats in social sphere, a serious gap between the rich and the poor leads to the growth of social tensions.
8. A serious fall of living standards of the population has aggravated demographic problems.
9. Growth of the threats of accidents and man-made disasters with serious negative consequences for the environment.

The following should be attributed to the main external threats to economic security:

1. Ukrainian economy is characterized by the great dependence on foreign economic situation, political and economic decisions of integrated groups of foreign countries, international financial and trade organizations that infringe on economic interests of Ukraine.
2. Occupation of internal Ukrainian market by a variety of commodities produced by and, consequently, dependence of Ukraine on imports of numerous types of goods.

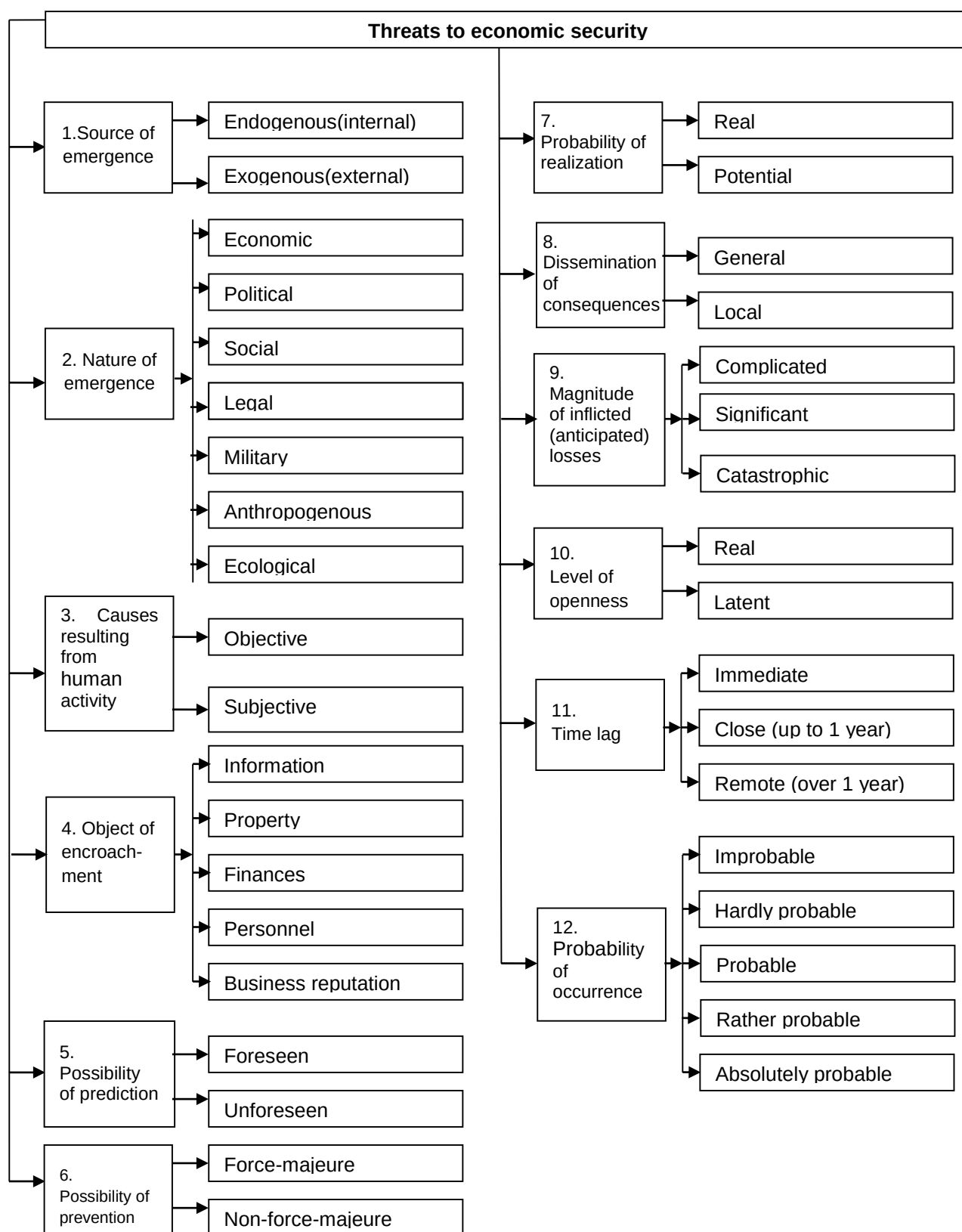


Fig.2. Classification of threats to economic security

3. High level of external public debt, growing budgetary expenditures for its repayment and the growing efforts to use it for exertion of influence on economic and political decisions of leadership of Ukraine.
4. Purchasing by foreign companies of Ukrainian enterprises with the aim of eviction of national producer from the production sphere and, subsequently, from foreign and domestic markets.
5. Inadequate export and foreign exchange controls and unregulated customs and state borders.

It is customary to distinguish emergence of threats by their nature as follows: economic, political, social, legal, military, technological, ecological and others. It is also proposed to classify threats to economic security based on the following characteristics: possibility of prediction, object of encroachment, possibility of prevention, level of openness, probability of realization, amounts of possible losses, consequences and time of occurrence, probability of occurrence.

Human activity can also be the cause of threats. Such threats to economic security are divided into objective and subjective. Objective threats emerge without participation and will of economic entity regardless of decisions and actions of administration. In particular, these are the state of financial situation, natural disasters, technological innovations, etc. They have to be predicted, measured and taken into consideration in decision-making. Subjective threats are generated by deliberate or unintentional actions of people, various agencies and organizations, including national and international.

According to the probability level, it is assumed to distinguish incredible threats, the possibility of which occurrence rate is zero; rare threats, which occurrence possibility is also quite low; probable threats that justifiably threaten market participants; probable enough, the onset of which is almost inevitable; quite probable, which are the closest to occurrence.

Depending on the possibility to predict, they distinguish expected threats which can be predicted, and unexpected ones. The first ones include those, occurring under conditions which

are known from the experience of economic activities, they are typical; they are timely revealed as generalized by economic science. The unexpected ones occur suddenly, unexpectedly. They are associated with unpredictable actions of external actors of economic relations, with the change of the legal framework, the deformation of socio-economic or political situation of force majeure (accidents, natural disasters), etc. Therefore, first and foremost, it is important to promptly identify threats and reduce their negative effects.

Depending on the possibility to prevent, they distinguish threats of force majeure or Acts of God. The first ones are notable for uncertainty of actions (wars, disasters, emergencies). Other ones can be prevented with timely, productive actions. According to the probability of threats implementation, they distinguish real threats that have the effect on the economic object, and the potential ones that can be either implemented, or may not occur depending on external factors and protective actions taken. It is suggested also to divide all threats into general and local, depending on spreading of the consequences of their actions. Depending on the scope of losses or damages, being the result of destructive factors, threats are divided into complex, significant and disastrous. Depending on the level of openness, all the destructive factors are divided into real that actually exist, and latent (invisible). They can appear suddenly, therefore urgent decisions, additional efforts and expenses should be taken for their elimination. As a special feature, we suggest to allocate an object of infringement (information, property, finance, personnel, business standing of organization, etc.). Overall classification offered is typical, as the list of threats presented can be implemented in any state or region regardless of the level of its socio-economic development, political system, etc.

Referring to Raczkowski (2012), Trzaskowska-Dmoch & Hryniewcka (2013, p. 387) point out that, "Increased economic and political interdependence requires determined and coherent actions for setting common national, European and global goals. Economical security of a business and financial trading guarantees prosperity for society and it applies to each realm of life. A sense of security refers to a lack of threats

and hinges on a variety of factors both individual, related to self-esteem through the outlook on life professed, and collective, connected with the involvement in a specific type of local, national or international community". The authors also note that, "The recent difficult years of 2011-2012 reveal certain weaknesses within the European economy. Debt soared and millions of people lost their jobs. The future of Europe is determined by actions which the member states are willing to launch." (Trzaskowska-Dmoch & Hryniewcka, 2013, p. 387) Problems in the European Union as the whole, no doubt, cause problems in its individual member-states. For instance, as part of the European Union, Poland's construction sector is influenced by the economic situation of the rest of Europe, including the financial problems of the Union and the collapse of the construction market in Spain (Trzaskowska-Dmoch & Hryniewcka, 2013, p. 404). Other problems include the availability of bank loans to businesses. Similar problems are faced by businesses in Ukraine. Based on statistical data, we shall emphasize and analyze the main threats to economic security of Ukraine in the period of 2010-2012:

1. Loss of productive potential due to a high degree of depreciation of fixed assets. Today wear on equipment in the majority of industries makes up 65.0%. Elimination of assets exceeds their implementation by more than 1.5 times (Osaulenko, 2012, p. 93).
2. Public and publicly guaranteed debt of Ukraine as of December 31, 2012 amounted to 516.405 billion UAH or 64.607 billion U.S. dollars, while as of December 31, 2011 it made up 473.122 billion UAH, i.e. Ukraine's public debt increased by 9.1% (Anon, 2013).
3. According to the Global Competitiveness Index, in 2012 Ukraine was the 73rd out of 144 countries (Index of global competitiveness 2012-2013, 2012). Moderate competitiveness of domestic products and the competing imports have a negative impact on Ukrainian commodity producers, manufacturing goods for the domestic market.
4. Population poverty rate and low quality of life of a considerable part of Ukrainians. Percentage of Ukrainian population with the average total revenue per capita per month

below the subsistence level decreased in the first quarter of 2012 by 5% in comparison with the first quarter of 2011, but it is still significant and makes up 25%. Correlation between total revenue of 10% of high-income and low-income groups in 2012 was 5.6 times (25 % ukrayintsiv mayut' dokhody, nyzhchi za prozhytkovyy minimum, 2011).

5. Growing number of unemployed. According to ILO methodology, unemployment in Ukraine in 2011 amounted to 1732.7 thousand (7.9%), in 2012 it was 1952.0 thousand (8.1%) (Riven' bezrobittya v Ukrayini za metodolohiyeyu MOP sklav 8.2 %, 2011).
6. The scale of flow of capital from Ukraine in recent years reached the level, which is threatening to the national economic security. According to the Ministry of Economic Development and Trade of Ukraine, about 30 billion U.S. dollars have been withdrawn from Ukraine since the declaration of its independence, with an annual scope of flow of capital from Ukraine being about 1.5-2.0 billion U.S. dollars (Pavlenko & Belyaeva, 2011).

Combination of threats in the financial sector, including a significant GDP load, financial and banking system of payments of external debt load, with increased negative trends in reproduction of capital is a special feature of the period under study. This creates irregularities in the functioning of life-supporting sectors and industries (energy, transport, housing and communal services).

As we have already noted, imminent peril to the economic interests is created by domestic economic concerns, which interfere with the normal development of social reproduction. These threats are: Ukrainian economy converting into the object of political opposition of political elites, political parties and movements, rupture of economic ties horizontally and vertically, loss of control of these ties, leading to a decrease in effectiveness of use of scarce resources, causing setback in production and investments; degradation of technical and engineering base of the economy; unemployment and inflation; avoidance of taxation; monopolization of Ukrainian economy, criminalization of economy and society; amounts of domestic and external debt; outflow of currency resources.

One of the significant external threats is growth of import dependency, excessive openness of economy. Ukraine continues to decline in industrial production. In the first quarter of 2013 there was recorded fall in the key sectors of Ukrainian economy - mining, metallurgy and machine building by 3.6%, 6.6% and 11.4%, respectively (Zholonkivs'kyi, 2013).

Fall in output, loss of end markets, structural degradation and technological regression promote economic recession. Reduction of intellectual, informational, scientific and technological potential of Ukraine, the investment crisis, technological security threats and losses due to emergencies, disasters and accidents represent a significant threat to the socio-economic development of Ukraine. A serious external threat is the lack of integral regulatory framework governing foreign-economic activities, import dependency, underdevelopment of infrastructure of domestic exports support, loss of developed end markets,

outflow of intellectual property and personnel abroad, export of currency, raw materials, etc. Proceeding from threats to economic security identified and systematized, we face a task of its strengthening in view of globalization of economic processes.

According to V.V. Kuzmenko, in order to ensure the economic security of the region, it is crucial to prevent emergence of threats (Kuzmenko, 2007). He proves that a threat is a possibility or inevitability of the emergence of socio-economic, natural or anthropogenic phenomena with predictable but uncontrolled undesirable events that may occur at a certain point of time within a given territory, causing deaths and injuries to human health, result in physical and financial losses, worsen the condition of environment and so on. The main threats to the economic security of the region (potential and existing) and the existing relationships between them are presented in Fig. 3.

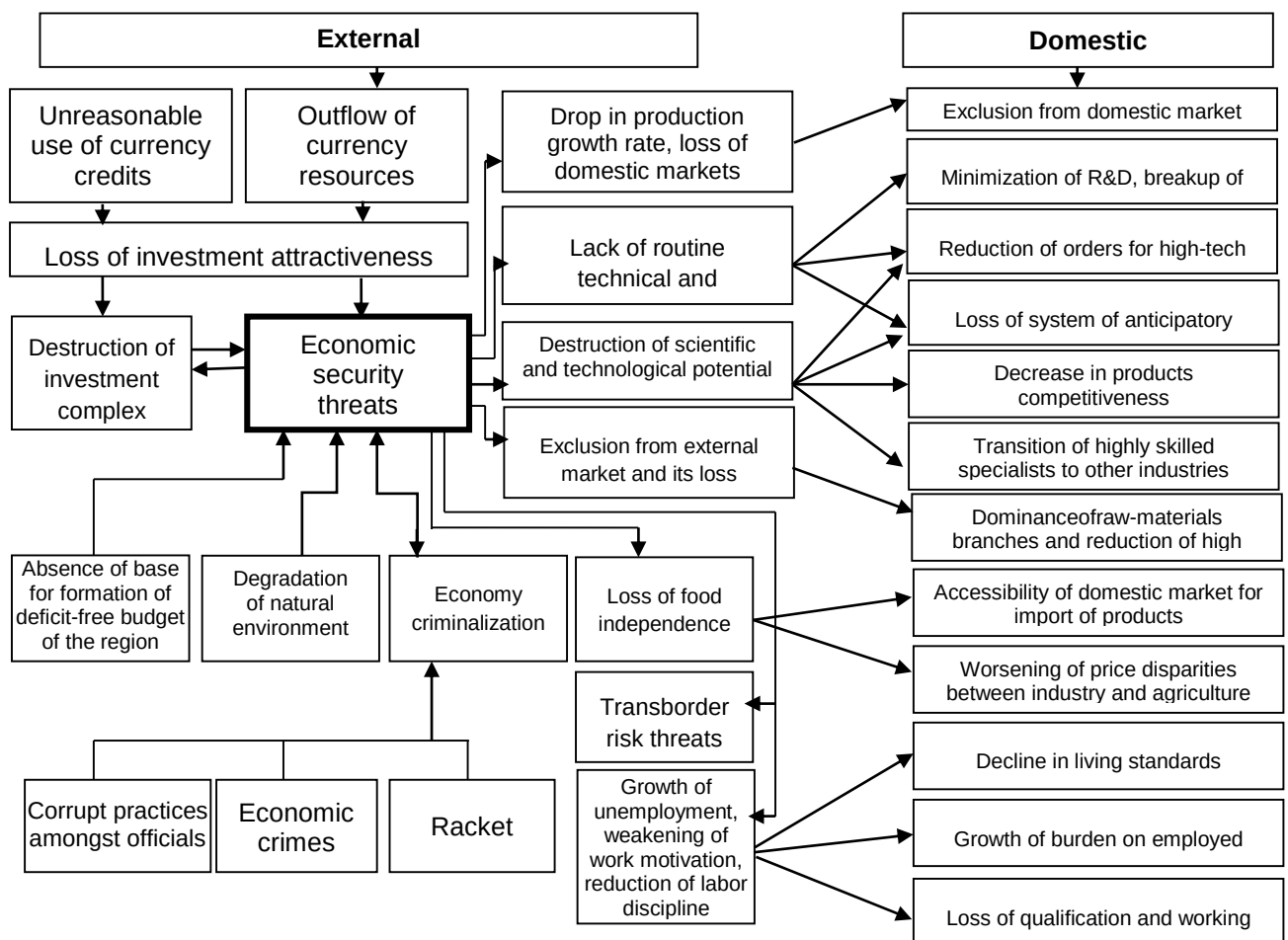


Fig. 3. Economic security threats of the region

We shall emphasize major threats to the economic security of the region:

1. Drop in production growth rates and loss of the domestic market. Underutilization of manufacturing capacities, closing of some productions and, consequently, the destruction of technological potential lead to collapse of a progressive structure of domestic industry on its own resource base.
2. Destruction of scientific and technological potential and deindustrialization of economy. Minimization of R&D, research teams collapse, reducing of orders for high-tech products, transition of highly skilled specialists to non-production sphere, dominance and development of raw-materials branches of industries and reduction of high-tech industries lead to degradation of scientific and technological capacity and decrease in competitiveness of the territory. Implementation of this threat in the territory is characterized, on the one hand, by slow and latent dynamics, and on the other hand, taking into consideration current territorial specialization of allocation of science-consuming industries (territorial specialized research and production centers), it may result in the loss of certain "links" of research and production process and deindustrialization.
3. Strengthening of possibility of trans-border risks implementation. In this case the effects of environmental, anthropogenic and other disasters can be passed "up the chain" to the neighboring regions, leading to the necessity to invest in localization of the sources of these threats and their elimination in the neighboring regions.
4. Loss of food independence leads to increased price disparities between industry and agriculture. Opening of domestic market for imported products and waiver of reasonable paternalism in relation to domestic producers lead to uncertainty in stable provision of population with foodstuff, increased dependence on supplies from other regions, destruction of agricultural sector of the region and the country.
5. Growth of unemployment, weakening of work motivation, and, as a result, reduction of labor discipline, growth of burden on employed, decline in living standards, sharp differentiation in incomes, and consequently, the destruction of consumer market give rise to social conflicts.
6. Economy criminalization. Growth of economic crimes, corrupt practices of officials cause distrust of people in the possibility to ensure legal protection.
7. Degradation of natural environment. Increase in anthropogenic stress and decrease in stability of natural territorial complexes lead to growth of the number of diseases and forced migration of people to other more environmentally favorable regions.
8. Lack of a stable base for formation of a balanced budget of the territory. This misbalance is reflected on the branches of social sphere, it increases subsidization of local budgets, creates the need for borrowing, leading to overall instability of the regional economy.
9. Lack of routine technical and engineering policy leads to a loss of investment attractiveness, destruction of purposeful system of personnel training, fall in competitiveness of domestic products, loss of advanced technologies, increased costs for the purchase of imported equipment, etc.
10. Loss of external markets. Minimization of high-tech production, especially in export industries, raw materials export growth with reduction of export of science-consuming and high-tech products result in the disproportionate flow of currency earnings, which reduces the possibility of renewal of machinery and equipment in high-tech industries. Negative foreign trade balance, improper use of currency earnings and loans in the absence of a clear normative base create unattractive investment climate in the domestic technology market.

The source of emergence of these threats is a system of economic relations not only between market players. Region in the structure of market relations is an independent business entity, and it

is forced to independently provide economic security, to foresee and prevent action of destructive factors, which arise both within the country and abroad.

According to the Ukrainian scientists S. O. Bila, O. V. Shevchenko, V. I. Zhuk, M.O. Kushnir, I. V. Valyushko (Stratehiya rozvytku rehioniv: shlyakhu zabezpechennya diyevosti: analit. dop., 2011, pp. 3-9) (Bila, Shevchenko, Zhuk, & Kushnir, 2011, pp. 3-5), A. Sunduk (2008, pp. 137-139), and Z. V. Gerasymchuk (2008, pp. 119-125), combination of systemic effects of endogenous and exogenous risks with the regional differentiation threatens economic development of the region and the national economy. The level of negative impact of threats to the economic security of Ukraine is different in different regions of Ukraine, depending on the specific character of economic and social situation in each region. Therefore, if the negative impact of threats such as criminalization of economy, "shadow" production and ever increasing level of economic crimes is defined as the most dangerous in almost all regions of Ukraine, the situation with the impact of other threats in the regions has significant differences.

In particular, in the regions of Ukraine with agriculture and foodstuffs production being the defining economic specialization (Vinnytsya, Volyn, Poltava, Cherkasy, Khmelnytsky, Ternopil, Chernihiv regions), the most acute threats are: loss of external end markets; aggressive domestic market penetration by foreign producers, growth of unemployment, irregularity of financial, tax and customs legislation of the country; structural and price imbalance. A similar situation exists also in the regions where export-oriented production is located, with low processing level and high energy and resource consumption, manufacturing raw materials or semi-finished products (Donetsk, Luhansk, Dnipropetrovsk, Zaporizhzhya, Mykolayiv, Sumy regions).

Quite a different situation is observed in the regions with dominating branches with high levels of processing that produce final products. Economic orientation of businesses in Kharkiv, Odessa, Mykolayiv, Zaporizhzhya, Lviv, Chernivtsi, Ivano-Frankivsk regions has this structure. High-tech productions, machine-building complex, military enterprises were and

are now located there. There are many institutions of scientific and technical specialization in the majority of these regions. The main threats in these regions include loss of external end markets; breaking of economic relations with foreign partners; growth of import dependence on certain types of strategically important raw materials and energy resources; uncertainty of the state policy in science and technology; loss of the national scientific and technical potential; unreasonable corporatization and privatization of enterprises, resulting in destruction of industrial and technological relations.

4. CONCLUSIONS

System of interaction and dynamic development of security threats is the basis for the need for a comprehensive, systematic approach to addressing security issues at any level of administration (state, region, enterprise). Comparative analysis of threats indicates that internal threats are the most dangerous ones. However, external threats increase the risk of internal threats due to systematic nature of the totality of threats.

Classification features suggested will help in the analysis of probability, prediction and control of emergence of negative consequences of the existing threats to economic security, in identifying sources of risks and the degree and extent of negative impact. This will facilitate in preventing the action of negative factors or a faster response to a danger. Security threats are not subject to a certain universal hierarchy of ranks. A comprehensive analysis of existing threats to economic security allowed summarizing that they represent a dynamic system of cause-and-effect relationships with a significant number of inverse relations, which existence may significantly enhance the destructive effect of any specific threat to economic security.

Threats to economic security are conditioned by changes in the external and internal elements of environment of the region operation, besides the greater is the threat intensity, the greater is the probability of its implementation. The level of negative impact of threats to economic security of the region depends on the structure of economic complex and socio-economic situation in the

region. Economic security threats in the fields of material production are almost immediately transformed into social sphere of the region.

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TRANSFORMATION OF INSTITUTION OF EMPLOYMENT AS AN ADAPTATION OF THE LABOR MARKET

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Abstract

This paper deals with the development of the labor market under the economic uncertainty. Analysis of the formation of flexible forms of employment in the country revealed that on their basis the adaptation strategies of labor market transition are formed. Proved, that the growth of employment in Ukraine is largely due to deformalization of employment. This makes it possible to reduce the likelihood of unemployment and maintain qualification skills of employees, but the state budget would receives less tax revenues, which increases the risk of budget deficits.

It is determined, that the distribution of new schemes using temporary involved (borrowing) work normally carried out within the framework of outsourcing, outstaffing and staff leasing under the terms of a civil labor contract. Labor legislation of Ukraine does not regulate legal relations connected with dealerships in hiring personnel through a civil contract and this eliminates employee rights, guarantees and compensations stipulated by labor legislation. It is proved that there is an urgent need for legislative regulation of the use of flexible forms of employment.

It is proved that the development of modern information and communication technologies and increased demand for new services specific to the information economy, leads to a new direction of development of remote employment - freelance. This paper investigates the dynamics of changes in the occupational structure of freelancers in Ukraine, which allowed us to identify major trends and key labor market trends in the field of remote employment. We also identified the benefits of non-standard flexible forms of employment and the problems they generate in the field of labor relations.

Keywords: labor market, employment, nonstandard employment, employment adjustment, labor supply

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1 INTRODUCTION

Recently an evident trend towards flexibilization of labor market reveals itself increasingly in developed countries. Objective basis for this

phenomenon are the new achievements of scientific and technological progress, the individualization of the labor process. Emerging trends of economic development come into conflict with strict regulation of working conditions bring to life new forms of work organization and remuneration, non-standard forms of labor market functioning. Individual terms of recruiting and the use of employees in the workplace are created. The formation of a flexible labor market can go in different directions and take various forms. Among them we can mark out nonstandard modes using full-time employment; non-standard forms of employment; increased flexibility in matters of hiring, firing, rotation.

2 BRIEF LITERATURE OVERVIEW

The issue of labor market flexibility and the use of non-standard forms of employment are the focus of Ukrainian scientists: S. Bandur, L. Bezitlesna, O. Grishnova, A. Kolot, E. Libanova, L. Lisogor, Y. Marshavin, I. Motorna, I. Petrova et al.

The study of specific mechanisms of adaptation of the labor market, and especially the flexible non-standard forms of employment are the main areas of research of western economists and sociologists. According to the American sociologist A. Kalleberh, the standard hierarchical organization of labor relations rather a historical anomaly, while various forms of non-standard employment - general rule (Kalleberg, 2000). Casey B. writes about flexibility of the labor market (Casey, 1991). Dutch economists T. Wilthagen, (2004) and F. Tros, (2004) developed the concept of a secure flexibility (flexicurity), devoted to analyzing the impact of flexible labor market institutions on its operation (Wilthagen & Tros, 2004). However, it is safe to emphasize that the problem of the use of flexible forms of employment in an unstable Ukrainian labor market is still understudied.

3 PURPOSE

Very important today is solving scientific task to assess the advantages and disadvantages of the use of flexible forms of employment in the Ukrainian labor market and to identify opportunities to use them for the labor market of Ukraine. These questions our dedicated article is devoted to.

4 RESULTS

Natural population increase remains negative in Ukraine therefore the demographic process predetermines a labor shortage. Because of the demographic challenge Ukraine has to recruit labor migrants. But migration policy for the purpose of migrants' integration into Ukrainian society can lead to deformation in the society. Therefore wide application of partnership between government and private sectors is reasonable. The partnership has established a reputation in various countries.

State and business structures (including TNC), international agencies forco-operationand development, public organizations (such as Diasporas and religion ones), donor organizations may operate as agents and interested parties.

Indicators of labor supply on the labor market are defined by economically active population amount. Economically active (15-70 years-old) population made up 22.01 million at the end of 2012. That is 16% less than it was in 2000 but relative ratio such as population economic activity level has increased 1.4 percentage point. The highest level of economic activity has been observed traditionally for 35-49 age group (for men and women as well). Rise in economic activity level of the group is provided with rise in level of employment.

Levels of employment in Ukraine are higher than average ones in European Union countries. In 2012 level of employment in Ukraine reached 59.7% of economically active (15-70 years old) population (State Statistics Service of Ukraine, 2013). In 27 EU countries it averaged 51.7% of population aged 15 and over (Eurostat, 2013). Levels of employment in Ukraine have been constantly grown from 55.8% of economically active population in 2000 to 59.7% in 2012. Youth employment becomes a problem of great importance. Youth reach the highest level of employment at age 30-34 when problem of the first job has already been solved and person has already reached defined professional level. Level of employment for aged 25-29 group is in essentially less. For the youngest (aged 15-19) level of employment is minimal that can be considered as a positive phenomenon, since at this age is more important to study and learned a trade. In the future it will raise a competitive ability of

young people. Comparing the levels of employment in different types of population centers, we can see that village youth enters the labor market earlier than the urban one but later on it prefers passive behavior strategy on the market or migration to towns, where there are more possibilities for getting a job (State Statistics Service of Ukraine, 2013).

Over a period of time previous to economic and financial crisis 2008-2009 there was some economic recovery accompanied by Ukrainian labor market stabilization and structural changes. But outstanding feature of that stage of development was *low quality of employment*. Employability (as a chance to get a job) was reducing constantly while economic activity was increasing. Interaction of these trends caused some negative self-strengthening economic processes on the labor market, in the economy and society. Growth of unemployment in Ukraine took place not only for account of noncompetitive individuals but for account of high educated and qualified professionals. So national labor market before the world economic and financial crisis was characterized by following features: low unemployment rate that was accounted for by inelasticity of employment with respect to GDP change, presence of structural disparities between labor supply and demand, excess of wage increase rates over labor productivity growth rates. Crisis aggravated the existing problems and demonstrated unsystematic character of employment policy in Ukraine. So far, as amount of officially registered unemployed is directly correlated to the financial position of the state, some administrative measures were used during the last crisis to avoid massive lay off and applications for unemployment status. Employment policy was primarily protective one and supported social stability, assisting in job placement for uncompetitive workers and fixing job quotas for them. That assists in unemployment level reduction.

Beginning of crisis did not lead to countrywide mass unemployment, and chronic jobless was avoided. Relative employment stability and reasonable level of registered unemployment were the main achievements of state authority, when it was opposed to consequences of a crisis for Ukrainian labor market.

Number of citizens which lost their work and became the job seekers reached peak in January-February 2009 but in second half-year signs of labor market stabilization were outlined. Unemployment level came down and at a later date it became lower than the indicator of EU countries, where unemployment sluggish growth has still been occurred. This might be a limiting factor for the following labor migration from Ukraine. The main problem in Ukraine is not an unemployment level itself but growth of the part of people who have sought for a job for 12 months and more. That means stagnancy intensification.

Job vacancies arose up to 2009 primarily at the expense of dismissal of blue-collar workers. Then a gap between number of blue and white collar redundant workers gradually narrowed. Crisis did not cause liquidation of jobs for unskilled employee. Dismissal level for jobs which did not need a special training remained stable. Labor demand traditionally was formed at the expense of manual workers but during crisis a demand for office employee increased (Figure 1).

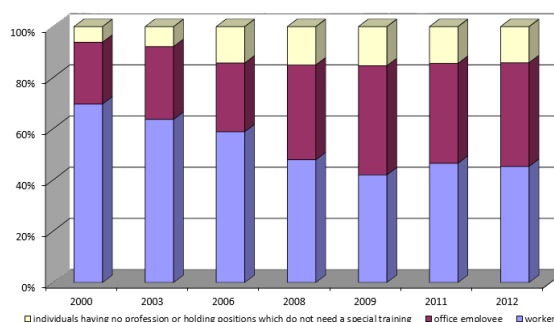


Fig 1. Labor demand dynamic by job categories (Source: official website of the State Statistics Service of Ukraine: <http://www.ukrstat.gov.ua/>)

The employment structure formed in Ukrainian economy during transformation period is not optimal. It still does not meet requirement of postindustrial society but describes labor deindustrialization process. When market-style reforms began, the growth of employment in services sector was expected. But as for Ukrainian labor market the "service" mainly means trade and also hotel and restaurant business. Reduction in industrial employment could be considered as a positive sign if employment in information and communication field were increased. Regretfully such trend in Ukraine is absent.

It is practically impossible to achieve balance between demand and supply of labor force in the modern job market only with market mechanisms (dynamics of the labor cost), the state implements a specific set of measures to ensure such a balance, which is an employment policy aimed at: ensuring the growth of population employment, stimulating employment of citizens who are not competitive in the labor market, self-employment of the population and job creation by small businesses, strengthening social protection against unemployment and ensuring reduction in the number of unemployed; increasing state regulation of employment.

Today, within the social and labor sphere there are a number of problems that need to be solved. First is the low level of wages, which leads to poverty of the working people (even minimum wage in Ukraine is 3 times lower than in Lithuania, and 20 times - than in the UK), there are back pays and other problems. Especially dangerous is the gap between actually implemented and formally set rules and regulations in the field of social and labor relations. Recently hasty and random and therefore inefficient decision-making in labor compensation only hampers further progress in complex addressing social problems.

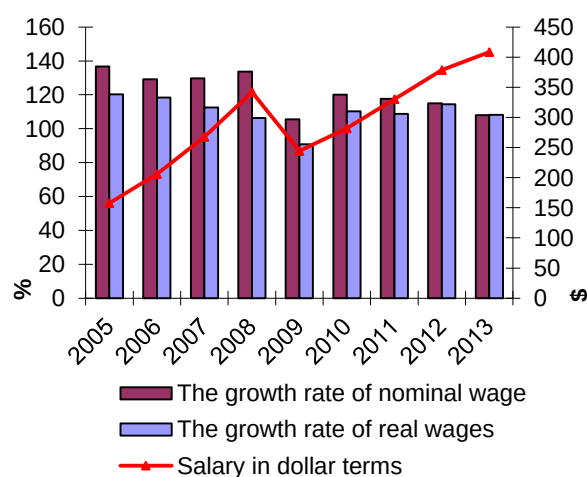


Figure 2. Dynamics of wages in the pre-crisis, crisis and post-crisis periods (Source: calculated by the authors according to the State Statistics Committee of Ukraine [electronic resource] - Available at: <http://www.ukrstat.gov.ua/> and the National Bank of Ukraine [electronic resource] - Available at: <http://www.bank.gov.ua/>)

The consequences of the recent crisis became the decrease in real wages in almost all industries,

understatement of the cost of labor force and unjustified differentiation of wages between certain groups of employees. Analysis indicates that real wages and salary in dollars regained the pre-crisis level only in 2012 (Fig. 2).

The highest salary for an extended period is kept in the same activities. According to results of 2011 these are financial activity (5340 grn), transport (particularly airlines - 8742 grn), metallurgy and manufacture of fabricated metal products (export-oriented industries, 3539 grn) and mining industry (4370 grn).

We can predict that the negative situation with deformities in remuneration of labor is not typical for all sectors of the industry. It will remain primarily in the public sector of the Ukrainian economy, where the impact of the crisis was particularly clear.

The problem of remuneration of labor in the public sector is one of the most painful one in the economic policy of Ukraine. For the majority of public sectors the composition and level of the personnel, the availability of highly qualified professionals, as well as an opportunity to attract young professionals are of particular importance. However, conditions of labor compensation clearly do not meet this task.

Given that the public sector employs about 34 % of all staff employed in the economy of Ukraine, the issue concerning optimization of their remuneration is undoubtedly very important (the concept of "public sector employees" include all employees whose salary is funded from the budget sources of different levels).

It should also be noted that mental, scientific, and cultural fundamentals of the society are exactly in the public sector, that the most educated human potential, the source of intellectual resources are concentrated there that we are losing each year primarily due to material demotivation (through internal migration to the commercial sector and external one - to countries with a higher standard of life). Limitation in remuneration of labor of employees of public sectors is unjustified not only in terms of social priorities but does not have an objective basis, as the skill level of public sector employees in general exceeds the qualification level of the other sectors of the economy. Although the mobility of employees in the sector is low, in recent years a lot of qualified professionals

(majority of public sector employees are in education, healthcare, science and most of these areas experienced the outflow) were lost.

Statistics show a continuous underpayment of employees of public sectors that does not encourage their recruitment with perspective, qualified specialists, and leads to higher concentrations of less productive employees. Despite the relatively high growth rate of the nominal wage in this area that took place in 2001-2007, the level of payment remained consistently low here. For example, the average salary for the first half of 2012 in healthcare accounted for 62.1% of wages in industry and in education - 73.6% (given that before 2001 the rule was applied in Ukrainian legislation, according to which the average salary of academic teaching staff of the higher educational institution had to be at a level no lower than twice the average wage in the industry). Thus the variation in the range gap for certain categories of employees were quite

substantial. It is clear that in the present situation of budget savings it is incorrect to suggest the increase in remuneration of labor. However, even under these conditions it makes sense to highlight the problem of determining the fair labor compensation. Today it is possible to implement structural reform of remuneration of the labor in the public sector without reducing the financing that will preserve the high level of qualification and ensure the principle of justness in labor compensation.

Wages are the main determinant of the sectoral mobility of employees. Thus, Figure 3. graphically shows differentiation (deviation from the average in Ukraine) in the ratio of employee turnover and wages by sectors in 2000 and 2012 respectively. It can be concluded that for those sectors where wages are significantly behind the average values for Ukraine, rates of mobility are significantly higher.

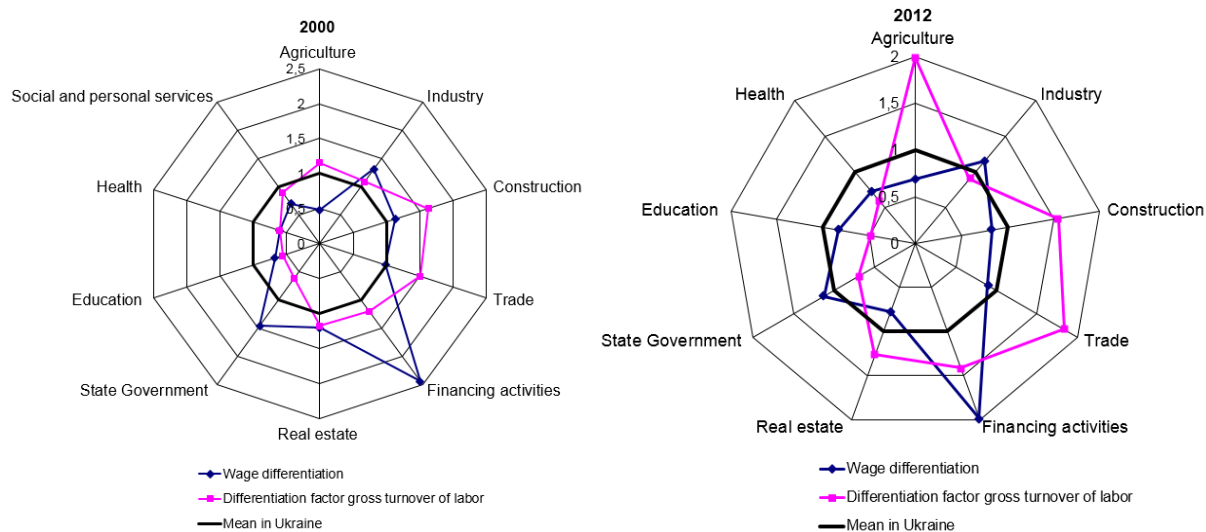


Fig.3: Sectorial differentiation of wages and labor mobility in Ukraine's labor market in 2000 and 2012

This situation exists primarily for agriculture, where differentiation factor by mobility is twice higher than the average for Ukraine, construction and trade sectors, where wages, which stand behind the averages in Ukraine, cause movement of workers. For financing activities, industry, public administration there is a situation at which wages are higher than average and therefore the human potential is more stable. Comparison of the differentiation by mobility and wages shows that, despite the understated indicators of labor compensation in education and healthcare,

people employed in these areas are characterized by low mobility, which can be explained by the accumulation of specific human capital, which cannot be used in other areas, and the presence of certain social guarantees to employees, which positively affects the human potential of these sectors. For such types of economic activities like trade, construction the role of specific human capital becomes insignificant and the change of work brings out the individual much more than the return from a

specific experience - experience in one area of employment.

The dynamics of gender differences in remuneration of labor in Ukraine is fairly stable phenomenon. Thus, the average economic ratio of wages of women and men over the last three years (2010-2012) amounted to 77.8%, 74.9%, and 77.6%, respectively. But the gender gap in terms of economic activity has some differences. For example, in agriculture and forestry the wage of the average woman according to data of 2012 is about 89.3% of men's wages, in education – 91%, in healthcare – 90.5% (Figure 4).

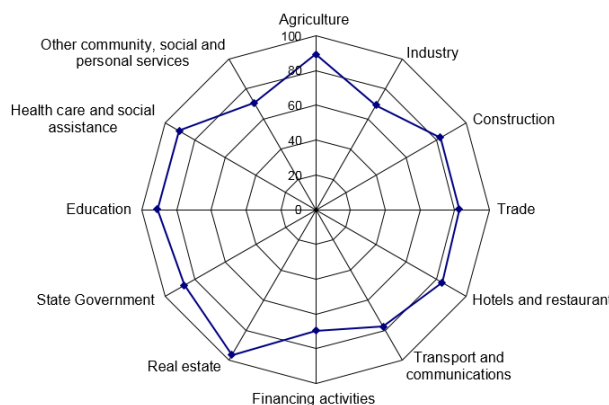


Figure 4: Ratio of average wages of women and men in economic activities in Ukraine in 2012

At the same time in the financial sector this ratio is less than 69.6 %, and in the sector of public, social and personal services – 70.8%. What can explain the differences in remuneration of labor between men and women in Ukraine? Issues of gender differences in payment ever belonged to the circle of interest of researchers of women status in economic activities. For example, Brainerd E. (2000) finds that the transition to a free-market economy had negative impact on the status of women in the labor market in Russia and the former Soviet Union countries. Some of reasons of the sharp increase in the wage gap between women and men from 20 percentage points in the early 90s to 30-35 percentage points in the mid-90s, which is the worst among Central-East European countries he sees in inequality of the accumulated human capital, levels of labor activity and employment structure as well as in the presence of discriminatory behavior of employers in the market. These findings correlate with the data presented in the Newell, Reilly (2001).

In the economic literature on the analysis of gender wage differentials there are three main reasons for differences in wages between women and men distinguished more often (Blau, F. and L. Kahn (2006); Jurajda, Š. (2005); Pastore F, & Vereshagina A. (2007)). First of all, the gender wage gap is explained by differences in the amount of accumulated human capital, both general and specific. Another reason, which may be distinguished, is the concentration of employed men and women in different sectors of the economy, jobs and occupations, and the third one indicates the existence of discrimination against women in the labor market.

Mechanism of regulation of the labor market of Ukraine should combine financial, structural and investment, social and economic, organizational and managerial components in the overall system of economic management and be implemented in the context of regional policy of economic reforms. Fundamental principle of economic regulation of the labor market should be the real cost of labor and effective employment of population, which in our case involves the activation of the process of the release of excessive labor force, the formation of the mobile labor pool, and the legalization of concealed unemployment.

An important factor of active and effective adaptation strategies for transitional societies is a reliance on the flexible employment models to support or replace the basic, standard employment. Ukrainian labor market, as the labor markets of other countries, is liable to significant changes under conditions of globalization. Implementation of reforms (in order to soften a crisis impact on the labor market) led to spreading of nonstandard employment. Labor force which is able to adapt immediately to changeable circumstances in the labor market was formed.

Globalization sets up new claims to labor force concerning its qualification and general educational attainment as far as "human factor" became a key element of new model of postindustrial development (Petrova, Blyzniuk & Kulikov, 2009). Standard employment gives place to atypical kinds of employment. Their spreading has objective social and economic grounds. Demand for nonstandard employment including part-time, irregular, distant or even informal ones is formed not only by employers but by certain

social groups: women, students, pensioners, freelancers and so on.

Today in Ukraine job growth of Ukrainian population takes place in a great measure at the expense of informal (shadow) sector of economy. Widening of informal economy during 2010-2012 enabled partly to absorb employee fired from formal sector, as a result of financial and economic crisis. In 2012 number employed in informal sector came to 4.7 million or 22.9% of employed population 15-70 age group. Expansion of the service sector as a result of Ukrainian economy transformations effected informal employment structure (Figure 5).

During 2007-2012 the maximal growth was observed in construction (3.8 percentage point) and trade (1.0 p.p.) per year. Agriculture is the main branch among other informal economic activities but there was observed a reduction in employment by 5.7 percentage point. Taking into consideration that 22.9% of employed population got job in informal sector in 2012, we can draw a conclusion that crisis intensified trend for deformalization of the employment structure. On the one hand, it is good that employed workers have not become unemployed or economically inactive. They maintain their work skills and habits. On the other hand, the State budget receives less tax revenue and a budget deficit is possible.

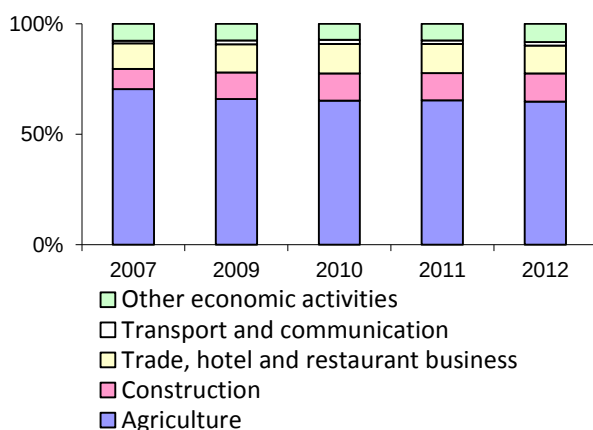


Fig.5: Informal employment structure in Ukraine (Source: official website of the State Statistics Service of Ukraine: <http://www.ukrstat.gov.ua/>)

Besides technological factors there is a considerable role of demand for the new service that is inherent in information economy. Employers need specialists of information technology sphere. Importance of professionals

who involved in work with information and have creative personal abilities grows rapidly. Also grows as hare of the jobs connected with information processing, relative to ones where material values are produced. However intention to reduce staff costs leads to transference of work activity outside office and widely-spread creation of flexible (virtual) workplaces. According to the researchers O. Pavuk and N. Moldenhower, as a result of the introduction of new technologies, correlation between the number of employees and growth of the industry is becoming less pronounced. It is the key manifestation of virtualization of economy (Pavuk & Moldenhower, 2013).

Virtual working environment of flexible employment provides for application of information and communication technologies (ICT). It means working through the information networks, working from home and special centers distant from the main company office (Motorna, 2008). We analyzed data from the cite freelance.com.ua which is specialized in working home employment. Information concerning changes in freelancers' professional structure in Ukraine made it possible to reveal main trends of labor market development in distant employment sphere (Figure 6).

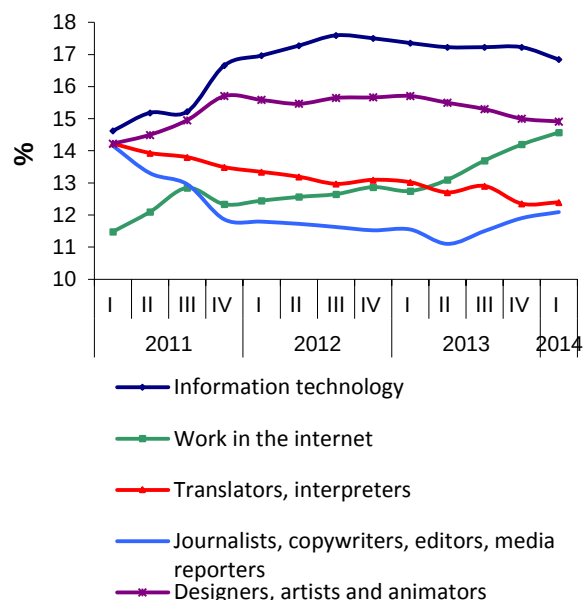


Fig.6: Proportion of freelancers by profession in 2011 – 2014 (Source: Compiled by the author L.Guk according to cite freelance.com.ua)

Besides technological factors, a significant part in employment structural change plays demand for a new service typical for information economy. During 2011-2014 information technology market demonstrated dynamic development. Number of freelancers at that period increased by 4.8 times, share of employed in this sphere was the greatest (16.8% by 2014). Employment related to work in the internet also developed dynamically. Share of freelancers in that sector increased by 3.1 percentage point. Designers, artists and animators form considerable part of freelancers. Since 2011 it increased by 0.7 p.p. and reached 14%. For that period apart of copywriters, editors, media reporters and translators fell but total demand for service of working home employee has grown impressively. According to the data of citefreelance.com.ua, number of projects per one freelancer permanently increases (Figure 7).

Official statistics claims that average labor income of a freelancer has nothing in common with average wage in the country and for majority of freelancers it is only an additional income to earnings at the place of primary employment. According to findings of a public opinion polls, 25% of respondents earn less than 100\$ per month. Only 7% succeed in earning 1000\$ per month (Labor market analysis, 2010). Earnings of a freelancer may be striking different by the month but it is impossible to control them because of absence of relevant statistics. Growth in number of distant employees in Ukraine is expected, because remuneration of Ukrainian freelancers is several times less than Russian or West European ones, and quality of their work can match international standards.

In Ukrainian labor market begin to expand *new mechanisms for arranging temporary, borrowed labor force* usually in the form of outsourcing, outstaffing, and employee leasing. Outsourcing means giving the responsibility for running a particular business-process or production function to another company (company-outsourcer) specialized in appropriate sphere of activity. For example, cleaning, catering, legal, account, IT, call-centre service, and so on. Service and support are usually occasional or episodal and are limited by start and finish. To outsourcer usually are transferred the function of professional support for trouble-free operation of

some systems or infrastructures on basis of agreement (as minimum for one year).

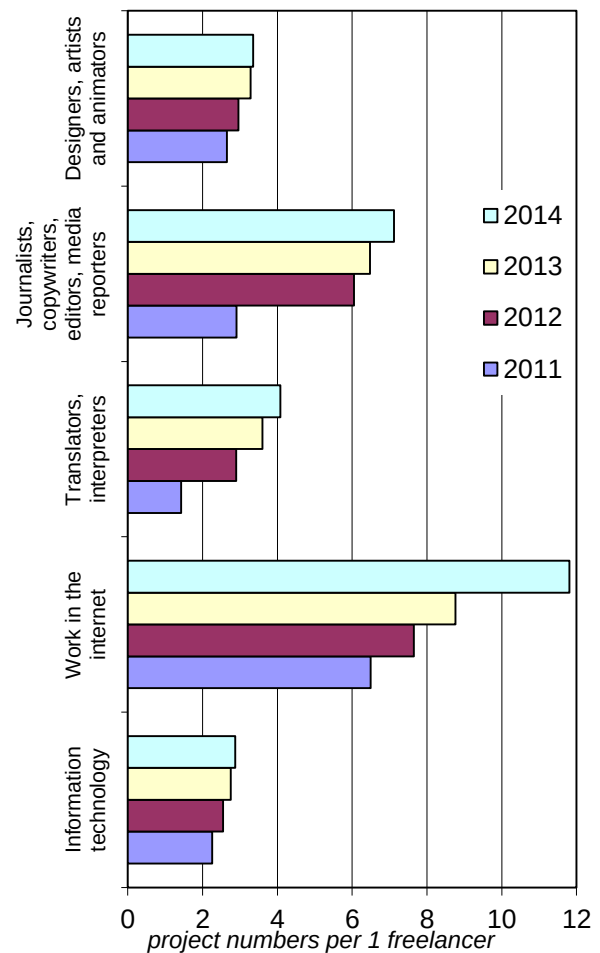


Fig.7: Project number per 1 freelancer in 2011 – 2014. (Source: Compiled by the author L.Guk according to the data of citefreelance.com.ua)

Outstaffing occurs when company for a time of certain work, enlists non-staff freelancers who have corresponding knowledge, skills, and experience. In contrast with outsourcing, an outstaffing provides for transfer of concrete workers. They are taken on the staff of company-provider (professional employer organization, staffing company) working in actual fact for the company-customer. But in practice by outstaffing often is understood a removal an employee out customer's staff and putting him on the provider's staff. At the same time an employee continues with his job at previous workplace but employer liability is laid on the provider.

Ukrainian labor legislation does not regulate the legal relationship connected with intermediation

under employment. Setting up an employment contract provides for reciprocal rights and duties between employee and provider but not between employee and a customer. In case of outstaffing a civil law contract is concluded and that deprives an employee of rights, guaranties, and compensations provided by labor legislation.

Staff leasing is a management technique that enables to supply company-provider's business process with necessary labor force enjoying service of lessor (professional employer organization, staffing company). When leasing a staff, customer does not conclude a labor contract with an employee and also may refuse his service any time if it is provided by agreement between lessor and the customer. Fundamental difference between staff leasing and outstaffing is following. Under outstaffing a termination of labor agreement between employee and a customer entails termination a contract between customer and provider which has the employee on its staff. Under the staff leasing labor relations between employee and a lessor remain valid.

Rapid growth of borrowed labor application indicates that such labor is productive. Its advantages consist in rise of labor market flexibility, lowering a stagnant unemployment, creation temporary or (sometimes) long-term jobs. The professionals not being on staff are involved into important high-skill job (advertising and design, computer and technical backup, financial management and audit, consulting, projecting, and so on). Applying new forms of labor management the employers can reduce product cost; reduce training budget and cost of motivation. They also can avoid prolonged and expensive procedures related to hiring and dismissal; maintain core workers employment for account of casual ones. It is possible to take off the staff non-core services delegating them to company-agent, thus reducing a tax burden and making own company more attractive to the investors.

As S. Hauseman affirmed, demand for temporary workers depends on company size, location (distance from a big city), seasonality of production, existence of trade unions, and structure of incentives, if social package exists or not (Houseman, 2001). Temporary employment probability is higher at the big companies, in the

big cities, for seasonal jobs, under absence of unions, etc.

There are a lot of irregular employment patterns watched on the labor markets of different countries. As for Ukrainian one it is possible to single out two main subtypes of irregular employment:

- 1) employment for a specified period (seasonal, temporary);
- 2) casual employment.

Employment for a specified period (seasonal, temporary) conforms to labor relation, meant for preconcerted period of time (including one that is long enough, 2-5 years), and it can be prolonged or recommenced after termination. Irregular employment might not come within the purview of labor legislation and may be regulated with civil standards. That is an employment for performance of a certain scope of work. Employment on the ground of **oral arrangement** is an extremely unstable employment basis, since in this case the employee finds himself devoid of any formal guaranties for continuity of employment. The most instable employment pattern is so called casual employment which means performance of individual works occasionally.

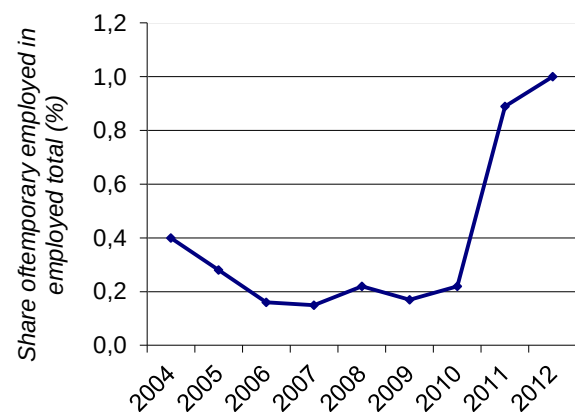


Fig.8: Dynamic of temporary employment level in Ukraine, 2004 – 2012. (Source: Compiled by the author L.Guk)

Distinguishing features of casual labor relations are their extremely short-term type under absence, as a rule, any formal arrangement. Range of such activities is enough wide: occasional repair, cleaning, nursing, baby-sitting, translation and some.

Number of temporary employed in Ukraine exceeded 865.17 thousand. They have 4.3% share of employed total that was a bit less than average for OECD countries. Like OCED, in Ukraine the scope of temporary employment grew rapidly from 0.4% in 2004 to 4.6% in 2012 i.e. 4.2 percent point increase (Figure 8).

Growth of temporary employment was uneven. Considerable increase was seen in 2011. That rise, in our opinion, was caused by methodological changes in statistical procedures for measurement of the temporary employment. Since 2011 the Ukrainian State Committee on Statistics begins to use variational list of temporary employment patterns. Sample survey statistics of population concerning economical activity during 2011, enables to separate out the temporary employment and casual one. Temporary employment level was equal to 3.4% and casual one – 0.9% of employed total.

Comparing these data with the showings for the former period, we can see that temporary employment level was considerably underestimated. Provided that part of employed workers having temporary contracts (particularly long-term ones) could identify themselves as permanent, they could underestimate actual irregularity of their employment.

Temporary employment is widely-spread among all social-demographic groups of population, so it makes this type of employment very mixed. But diffusion level is different. In developed countries, as it shown in the Figure 9, share of temporary employed among women is much bigger than among men. In Japan and Finland women accounts for more than 60% of temporary employed, in most countries - about a half. Only in Turkey, Russia, Estonia and Ukraine the situation is opposite, and risk of temporary employment is higher for the men.

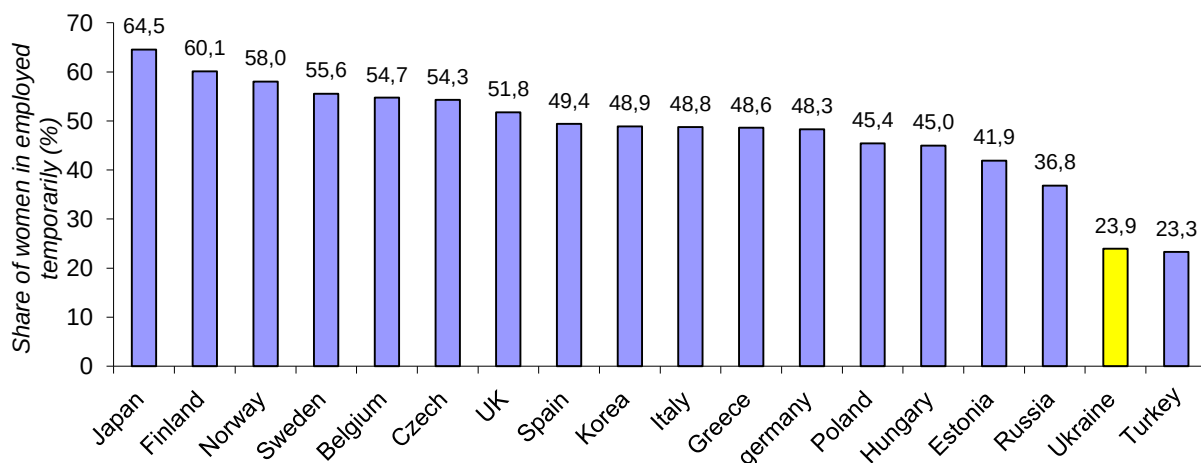


Fig.9: Share of women in temporary employed total, 2011 (Source: Compiled by the author V. Blyzniuk)

In Ukraine, unlike the majority of other countries, there is much more probability for men to be employed on irregular basis, than for women. In 2011, temporary employment level for men amounts to 6.3% (2.1% for women). Men made 76.1% of temporary employed total, when women – only 23.9%, so temporary employment is inherent in men population much more than in women one.

Temporary employment simplifies for employers a dismissal procedure of workers. Since compensation for dismissal of such employee is minimal, we find conceivable that this pattern of nonstandard employment will cover the least productive workers. Investments in their

education and professional training are the lowest, and there is enough supply of such workforce on the market.

Application of flexible employment patterns in order to support or substitute a standard employment, is an important factor of active and efficient strategies for society in transitional period.

Flexible part-time models in Ukraine, as well as in a large part of countries with transition economy have a number of features. Administrative leaves are a result of a reduction in labor demand. As shown in Figure 8, the proportion of employees in this mode in Ukraine amounted to 1.3% in 2012, but this indicator is higher than pre-crisis one

1.1% in 2007. An important trend in the use of social and employment potential in Ukraine in 1990s was a rise (from 5.6% in 1995 to 17.6 % in 1999), and in the 2000s - reduction (from 13.3 % in 2000 to 4.4 % in 2007) of the proportion of part-time employees. It should be noted that the result of the financial crisis in the late 2000s was the increase in the level of underemployment in Ukraine to 19.4 % in 2009, decrease in the level of underemployment in Ukraine in 2012 to 7% indicates a revival of economic processes in the country.

The deregulation of the market is due to diminution of the importance of the Labor code of Ukraine in favor of individual labor agreements and sectoral collective agreements in favor of agreements in the company. The contract system of employment, the use of part-time working week (day) or temporary work, reduction of the total amount of workers' rights leads to the deregulation too.

For successful restructuring of the implementation of radical transformation and innovative development the flexibility of labor relations is needed. It is necessary to take appropriate actions, which related to all its components - wages, social security forms, working hours etc. One way to perform mentioned tasks is the concept and policy of flexicurity aimed at optimal combination of labor market flexibility and social security resulting in a flexible security model.

Thus, the non-standard forms of employment significantly extend person opportunities when selecting a suitable job and allow more efficient use of the social and employment potential, meet own needs, including material ones. In general, the development of non-standard forms of employment is a step towards the more flexible labor market that is an objective trend all over the world and in Ukraine in particular. Diversification of labor relations is something as inevitable as the modern technological and social and economic transformations objective are.

The increased competition, expansion of globalization processes and the associated labor resources mobility necessitated the formation of the labor market, which would be the most mobile and adequate according to changing conditions of

personnel policy. Simplification of hiring and firing procedures, rapid change in quantity and quality of personnel, optimization of the search of staff of the qualifications needed at this point are capable to help companies to remain competitive in the market under crisis conditions. In the last five - six years all labor market actors recognized the need for introducing fundamental changes in the normative-legal field of the employment policy.

The main goal of the state social policy is to maintain employment stability and to prevent serious deterioration of the material conditions of employees in connection with the transformation of the labor market. In addition to the social importance maintaining stability of employment has a significant economic effect, which is particularly important in an era of innovation economy - the need to maintain long-term employment relationships may induce employers to invest considerable funds in education and training of their employees.

But there is a reverse of the coin. Significant costs (associated with the loss of both time and financial investments) that companies have to bear if there is a need for serious structural changes may become an obstacle towards the modernization of both the companies and the economy as a whole. Thus, maintaining the stability of the employment relationships may contribute to preservation of inefficient economic structure of the country. In addition, incentives to a significant influx of new (including foreign) investment disappear, which is due to uncertainty of entrepreneurs about the possibility of rapid modernization of the business, as appropriate. The negative consequences of such a situation may also include: expansion of the proliferation of "gray" business, the increase in stagnant unemployment and increased segmentation of the labor market.

In order not to allow structural changes lead to a significant deterioration of the employees, on the one hand, and become an obstacle to the flow of investments into the economy of the country - on the other hand, the state must maintain a significant impact on the labor market, and its policy should be well-targeted and aimed at modeling of a healthy, educated and skilled workforce that can adapt to changes.

5 CONCLUSIONS

Thus, the non-standard forms of employment significantly extend persons' possibilities when selecting a suitable job and allow more efficient use of its labor potential, meet their needs, including material ones. However, the main disadvantage of employment deformalization is the problem of filling funds for social purposes, shortfall in state budget tax revenues, narrowing budget capacity to fund social infrastructure, social services and social security.

Thus, the advantages and disadvantages of non-standard employment due to the fact that on the one hand, it is a factor that provides the flexibility of the labor market, but on the other - makes weaker position of workers in this market. Therefore, on the one hand increase the social

costs arising from non-standard employment, on the other hand, it is an instrument of adaptation for firms and workers to the changes taking place in the conditions of post-industrial development.

In general, the development of non-standard forms of employment is a step towards more flexible labor market that is an objective trend all over the world and in Ukraine in particular. It is proved that the main factors affecting the formation of non-standard employment is a structural shift in the economy that are dictated by the transition from industrial to post-industrial mass production, significant expansion of services, large-scale implementation of information and communication technologies, in all sectors, strengthening the role of globalization and increasing the flexibility of employment.

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REJOINDER TO HUDIK ON TRANSITIVITY

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Abstract

Block and Barnett (2012) was an attempt to defend Austrian economics against a neoclassical criticism of it based on the money pump, an attempted *reductio ad absurdum* of the praxeological school's rejection of transitivity and stable preferences. Hudik (2012) is a critical response to Block and Barnett (2012). We regard Hudik (2012) as a defense of mainstream economics in this regard and thus a renewed attack on Austrianism. The present paper is an attempt to refute Hudik (2012).

Keywords: Transitivity, indifference, preference, choice, time, rationality, stability, consistency

1 INTRODUCTION

We are very grateful to Hudik (2012) for his attempt to promote neoclassical economics and undermine an Austrian contribution to this discipline. An oft-made critique of the praxeological school of thought is that its adherents do not communicate with the mainstream of the profession (Laband, and Tollison, 2000).¹ The present interchange is evidence to the contrary.²

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In Block and Barnett (2012) we attempted to counter the “money pump” argument,³ a *reductio ad absurdum* of the Austrian critique of transitivity. Briefly, it states that a person who gets into this trap will lose all of his money. Therefore preferences must be transitive, contrary to the praxeological view that they are not, indeed, cannot be.

What problems does Hudik (2012, p.456) have with this thesis? There are many. One such is that we confuse stable preferences with transitivity; that we really aim at the former, not the latter, and do not realize this. The two, of course, are not unrelated in this analysis. But our target is the latter, not the former. However, it cannot be denied that a key element in our rejection of transitivity of

¹ For a refutation, see Sutter, 2012; Block, Westley and Padilla, 2008.

² Who says Austrian economists do not sometimes based their claims on “evidence”?

³ For background on this concept, see Cubitt, and Sugden. 2001; Echenique, Lee, and Shum, 2011; Fishburn, 1991, 1988; Rabin, and Thaler, 2001.

preferences is that it relies, intimately, on the stability function. It is only when preferences are assumed stable that intransitivity makes no sense. For example, if $A > B$, and $B > C$, then of course $A > C$, assuming no other changes. If someone wants to maintain $C > A$, he has some explaining to do.

In section II we discuss a minor disagreement Hudik has with us. Section III is concerned with the distinction between preference versus size relationships. The emphasis of section IV is on temporality. Section V focuses on singularism, VI on rationality, VII on time, VIII on stability and IX on indifference curves. We conclude in section X.

2 MINOR ISSUE

A minor difficulty Hudik (2012, p. 457) points out is that “Transitivity (is) far from *being* an ‘equation’ as Block and Barnett (2012, p. 238) claim” (emphasis added by present authors). But we made no such claim. Instead, we said that transitivity may be “denoted” by an equation. “Denoted” means “illustrated,” or “exemplified” or some such. Surely our use of “denoted” did not constitute so grave an error as to even merit mention?

3 PREFERENCE AND SIZE RELATIONSHIPS

Hudik (2012, 457) next taxes us that we cannot properly distinguish between “to be greater than” and “to be preferred to.” His proof? We are guilty “us(ing) the same symbol “ $>$ ” for both. But surely it takes no great intelligence to make a distinction of this sort? Is it really such a great leap of faith in the reader on our part that we would expect him to discern this issue from the context? In our defense, if such really be needed, that we really can distinguish preferences from greater or lesser, we do say (Block and Barnett, 238): “... difficulties arise when the constituent elements of the argument are not objective dimensions⁴ but rather preferences.⁵”

⁴ Read “to be greater than” here.

⁵ Read “preferences” here.

⁶ Note, we do not use this symbol “ $>$ ” any more, lest it confuse the reader. Well, at least not in this paragraph.

4 TEMPORALITY

Hudik’s (2012, p. 457) next sally is more substantive: “... (contrary to what Block and Barnett suggest) the relation ‘to be preferred to’ as used in mainstream economics is atemporal...” *Contrary* to what we said? This is precisely our critique of orthodox economics. Nor did we “suggest” any such thing. Rather, we came out and explicitly charged neo-classical economists with this very fallacy. That is precisely why there is no logical contradiction, no irrationality, if a man prefers A to B, B to C, and then C to A.⁶ It is because in the real world of Austrian economics,⁷ decisions can only occur at a given point in time, and each one takes place at a different place in the time dimension.

5 SINGULARISM

Hudik (2012, 458) asserts that “... transitivity is widely used in Austrian economics ... whenever the concept of a ‘preference scale’ is mentioned.” True, all too true. But this is a widespread error, within the praxeological community. According to Mises’ insight about singularism, all action is binary. It consists, solely, of choosing one thing and setting aside another, the next best option. Strictly speaking, and how else are we to consider Misesian methodology, there are no preference scales out there, or inside us either, that consist of several, or dozens, or hundreds, of options. There is only choosing and setting aside. As we say (Barnett and Block, 2009) in that context: “Given the above considerations, it is clear that there is a contradiction between Mises’ theory of singularism, and the scales of values employed by both Rothbard and Menger. If the former is taken seriously, then only one human action can be undertaken at a time. If the latter are correct, *more than* only one human action can be undertaken at the same time ... There is at the very least a tension between two basic building blocs of Austrian economics. The doctrine of singularism maintains that choice is inevitably and necessarily between two and only two things: that which is

⁷ Joseph P. Salerno and Peter Klein have emphasized that Austrian economics embodies the causal realist approach to which we the present authors subscribe. See on this http://wiki.mises.org/wiki/Causal-realist_economics

chosen, and the next best alternative, which is set aside. However, implicit in the concept the scale of values is the claim that choice can take place over many, many alternatives. If one of these has to be jettisoned, and we argue that one must be, then we vote for the latter.”⁸

So Hudik is correct in his assertion that preference scales and transitivity are “widely used in Austrian economics.” But, we claim this is a weakness, not a strength. Many practitioners of the praxeological school have lost sight of this crucially important contribution of Mises.

6 RATIONALITY

Hudik (2012, p. 458) misunderstands our (Austrian) use of the concept of “rationality.” He construes it as “completeness,” whatever that is, and offers to us, in his helpful manner, “reasonability.” But we were very clear in Block and Barnett (2012) as to how we were using this word. Here is our footnote 5, in its entirety: “States Mises (1998, p. 103): ‘The attempt has been made to attain the notion of a nonrational action by this reasoning: If *a* is preferred to *b* and *b* to *c*, logically *a* should be preferred to *c*. But if actually *c* is preferred to *a*, we are faced with a mode of acting to which we cannot ascribe consistency and rationality. This reasoning disregards the fact that two acts of an individual can never be synchronous.’ We owe this citation to Gordon (2003).”

According to Hudik (2012, p. 458), “... the so called ‘money pump’ argument is not intended to be a ‘knockout blow against the Austrian contention that there is nothing irrational about non-transitivity.’” But even this author (2012, p. 459) admits that “people with intransitive preferences might have a hard time surviving in market competition.” It that is not at least an attempt at a “knockout blow” it is hard to know what would be. For if the trades under these conditions continue indefinitely, the person with intransitivity would lose all of his wealth.

7 TIME

In his discussion of transitivity and time Hudik (2012, p. 459) avers: “As acknowledged by both the Austrians and mainstream economists, an observer does not have direct access to the preferences of an agent; all he can see are the agent’s choices.” Not so, not so, at least for the neo-classicals, although we acknowledge that this is an accurate interpretation of the praxeological vision. However, orthodox economists do indeed think they have “direct access to the preferences of an agent.” Do they not write utility functions? Do they not avail themselves of indifference curves? These, surely give them all the “direct access to the preferences of an agent” that anyone could want.

We are again accused of failing to understand a distinction; this time one between “transitivity of preferences” and “consistency of choice” (Hudik, 2012, p. 460). This might well even be true, for all we know. We are completely aware of the meaning of transitivity of preferences; well, at least we think we are. But, frankly, we are stumped by “consistency of choice.” Does this mean one always picks vanilla ice cream over chocolate, when both are available? Can choices be consistent,⁹ when *ceteris paribus* conditions never hold?

8 STABILITY

The heart of Hudik’s (2012, p. 460) disappointment with our paper concerns stability of preferences, it would appear. And here he turns from Austrianism to orthodox economics, relying upon, defending, such stalwarts of that viewpoint as Gary Becker, no Austrian he (Block, 2013). We are presented with a demand function where the demand for quantity of a good depends upon its price, one’s income and his tastes. When the former changes, our task is to determine which of the independent variables is responsible, and we are to strive mightily not to focus on the latter, that is, tastes.¹⁰

⁸ See also Barnett and Block, 2010.

⁹ Whatever that means

¹⁰ Hudik, 2013 relies heavily in this section on Stigler and Becker, 1977. For other Austrian rejections of the “physics envy” of mainstream economists, see Barnett,

2008, p. 140, fn. 20; Callahan, 2001; Clark and Primo, 2012; Mises, 1978, 1998; Prowse, 1996; Rothbard, 1960, 1992, 1997; Taleb, 2010, p. 184; Terrell, 2010.

Becker and Stigler (1977), with support from Hudik (2012) venture out onto this path in an attempt to put economics on a “scientific” basis. And, as the physical sciences are to a great degree dependent upon observable phenomenon, then so, too, must be economics, in this view. But Callahan (2001) quite properly gives this thinking the back of his hand:

“Imagine someone suggesting that the best way to gain understanding of literature is by focusing only on observable phenomena. We could watch lots of people reading, follow them around in bookstores, study the chemical composition of the books themselves, and so on. But we would never explore what these books meant to anyone—including ourselves—because this is an ‘unobservable.’

“The fact that a focus on observable, physical events has been a successful strategy for understanding the observable, physical world is really not too surprising when you think about it. But the phenomena of economics, literature, religion, and so on are mental phenomena, and we have no reason to believe that this same technique should work for increasing our understanding in these areas. The techniques employed are chosen because they mimic those of the physical sciences, not because they deepen our comprehension of the phenomena in question. If we only think of people as acting in an entirely different way than our own, human experience tells us they act, then our mathematical models will ‘work’ better.”

States Hudik (2012, p. 460): “Where Block and Barnett seem to be satisfied with the explanation ‘Green changes his mind about his trip to Canada’ (Block and Barnett, 2012, p. 241), a mainstream economist who follows Becker’s research program, far from denying that unexplainable changes in mind can occur, would look for a hidden parameter that might have played a role in the change of Green’s behavior.”

We agree with Hudik on this point, and enthusiastically so. But why, pray tell, should Austrian economists such as the present authors wish to follow Becker’s misbegotten research program? If all Hudik’s (2012) critique of our paper amounts to is that it is insufficiently mainstream, we fully accept this verdict of his, again, quite enthusiastically.

9 INDIFFERENCE CURVES

But our author is not quite yet finished. He has one more arrow in his quiver: a criticism of our treatment of indifference curves. It is a staple of mainstream economics that indifference curves cannot cross. This implies irrationality; e.g., denial of the premises of this tool of orthodox economic analysis a veritable contradiction of them. And, too, overlapping indifference curves denies transitivity, another bed-rock of their philosophical armament. In figure 1 of Block and Barnett (2012, p. 245) we depict just such an occurrence. A and B are equally preferred, since they are both found on indifference curve U₂. A and C are also equally preferred, since they are each located on indifference curve U₁, which crosses U₂ at point A. We claim it is transitivity that undergirds the claim that indifference curves cannot intersect. Of course, with unchanging preferences, B must be preferred to A if we confine the chooser’s tastes to that depicted in the indifference curve mapping.

Hudik (2012, p. 461), however, is having none of this. He asserts: “The crossing of indifference curves is nothing but a graphical representation of intransitivity: the two are just different means of representing one idea. Therefore, it is simply not true that “indifference curves are compatible only with transitivity” (Block and Barnett, 2012, p. 239) and that “[i]f transitivity fails, according to this logic, then so must indifference curves” (Block and Barnett, 2012, p. 246). Whether preferences are transitive or not has no bearing whatsoever on the *existence* of indifference curves; it translates only into their *properties*.”

But this seems to be a distinction without a difference. Indifference curves cannot *exist* if their *properties* do not include the proviso that they cannot have any points in common.

10 CONCLUSION

Our thesis in Block (2012) was that the money pump reduction ad absurdum fails to overturn the Austrian critique of transitivity. As long as preferences are stable, Becker and Stigler et al to the contrary notwithstanding, transitivity cannot be a viable bedrock of economics. Hudik’s contribution, as we see it, is to emphasize stability. It is indeed very important, and this author does yeoman work in pointing that out. Perhaps we should have entitled our own paper “Transitivity,

stability and the money pump” instead of
“Transitivity and the money pump.” Where was
Hudik when we needed him?

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MARKET ANALYSIS OF ENTERPRISE RESOURCE PLANNING SYSTEMS WITH FOCUS ON UKRAINE

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Abstract

The main trends and forecasts of Ukrainian IT-market are described in the study. The main attention was paid to ERP-systems. There are suggested strategies in accessing the Ukrainian IT market with a view to minimize potential risks and delays. The major problem for Ukrainian companies is non-stability of running business in Ukraine which often results in the absence of real long term strategic plans of the enterprise development. This is a real problem for the use of informational technologies. The fact is that while the informational technology is in use only to solve local tasks and improve some business processes, it does not require the strategic approaches and fits completely the common pattern of national enterprise management when its activities are planned maximum for a year period.

Keywords: ERP, IT-market, Ukrainian IT sphere, accessing IT-market, Countries of Central and Eastern Europe (CEE), Commonwealth of Independent States (CIS)

1 INTRODUCTION

Transformational conversion of the Ukrainian enterprises caused by the market economy reforms and globalization processes is of paramount importance due to the joining of Ukraine the World Trade Organization (WTO). A great number of the Ukrainian enterprises has

been owned by transnational companies or have drawn actively foreign capital investments. It stipulates a certain change in enterprise management approaches which are alike those of Western managers'. It concerns, largely, the implementation and use of modern information systems and technologies.

In real problems of IT-management and ERP implementation in UKRAINE are explored only by ERP-vendors and consulting companies such as:

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SAP, Microsoft, GAAP, IDC, CONIM etc. (Verstiak, 2012).

The answer as for expediency or non-expediency of enterprise automation has been known for a long time. However the problems of the choice of the kind of informational system, the way of its designing, programming and implementation, the degree of automation of business processes and information system integration in Ukraine are still open for the discussion.

2 IT-MARKET IN CEE AND CIS COUNTRIES: KEY TRENDS

According to free analysis (PMR, 2013) Russia has the biggest IT market from amongst all the CEE and CIS countries: in 2012 the market accounted for almost 50% of regional IT market sales. By contrast, the Romanian market in 2012 created little more than 3% of the market value represented by the analyzed countries of CEE and CIS. In 2012, the IT market in Poland, considered to be the second-largest market among these CEE and CIS countries, amounted to 20% of regional IT market sales. Despite the country's huge population, Ukraine's market value only reached about 4% of the total. The Czech Republic, by contrast, is doing pretty well: its population (almost five times smaller than that of Ukraine) accounted for a share valued at almost 12% of the total analyzed market (PMR, 2013).

In Russia, computer hardware remains the largest segment within the IT market: it has a market share by value of almost 58%. IT services has a market share of approximately 27%; software follows with more than 15% market share (PMR, 2012). This market structure is only partially explained by the ongoing high rate of software piracy in the segment of home users and small businesses. The main reason for this structure is the investment orientation of IT spending in the country. Russian IT companies still earn most of their sales from the implementation of new IT systems (or upgrades and expansion); hardware is the largest budget expense in these IT projects.

The IT market structure in Ukraine is dominated by the hardware market, whose market share is more than 77%, followed by IT service's market share of more than 13.5%, and the software market's market share of more than 9%. Other countries have similar market structures: the hardware

market has the highest market share of more than 40%; the software market share accounts for around 20%; IT services maintains a market share of approximately 30-40% (PMR, 2013).

In Russia, the value of the IT products and services segment increased to RUB 678.2 billion (EUR 17 billion) in 2012. This represents 15% more than in the preceding year. The majority the country's leading vendors, distributors and system integrators reported growth in sales revenues last year (PMR, 2013). One should note that the devaluation of the Russian ruble is accountable for about half of the market growth. The Russian IT market depends on imported hardware and software. IT project budgets are often designed to take into account the exchange rate with the US dollar.

The last three years on the Polish IT market should be assessed as favorable. The growth rate, although lower than initially thought, remained definitely positive. The market value exceeded levels seen in 2010. The positive trend continued. As mentioned above, the IT market does not function separately from macroeconomic factors, including global factors. Even though this industry in Poland is relatively resistant to market fluctuations, the performance and stock prices of IT companies are not fully resilient to general market sentiment. Beginning in 2014, the growth rates of all of three segments – hardware market, software market and IT services – are going to decline slightly (PMR, 2014).

The statistics, data and macroeconomic indicators gathered by PMR, as well as its forecasting models built on those, indicate a slight growth on the telecommunications market in the region in 2013 to a total of €65 billion (PMR, 2013). The CEE countries seem to be quite homogeneous when it comes to the telecommunications market trends and tendencies. However, some regional, country-characteristic differences appear. One should also remember that not all the CEE telecom markets are evenly competitive, which can ultimately create some rigidities and cause visible differences among analyzed countries. For instance, PMR market experts forecast that in countries such as the Czech Republic and Poland, the value of the telecommunications sector will diminish this year.

The total value of the Russian telecommunication services market increased by 6% year on year to approximately €31.4 billion in 2012 (PMR, 2013). The market reached maturity. Its overall growth was driven by niche services including mobile internet access and content distribution. Traditional voice telephony and wired broadband showed either relatively modest development last year or stagnations in sales. In subsequent years, the main challenge on the market for telecommunications operators will be to adapt to its relatively modest overall growth and stagnation in voice services.

The value of the Polish telecommunications services market in 2012 was €9.2 billion, a decrease of over 2.2% compared with 2011. The negative trend has continued in 2013 (PMR, 2014). Nevertheless, in PMR's opinion, the value of the telecommunications market in Poland will bounce back in 2014-2015 thanks to the mobile telephony and data transmission segments. It is worth bearing in mind that in recent years MTR reductions have had a relatively significant impact on the value of the mobile services market in CEE. The value of the telecommunications market in the Czech Republic for instance has been declining for the last four the years and not only due to strong competition among providers and overall economic slowdown. In 2012, the value of the Czech mobile market dropped by as much as 12% to €2.5 billion and the negative trend will maintain this as well. In general, mobile telephony markets in CEE are already characterized by a very high level of saturation and, as a result, are growing slowly in terms of SIM card numbers (PMR, 2014). They are often declining due to wholesale market regulation and price competition. It is important to note that, despite the high penetration level measured by the number of SIM cards in the statistics presented by operators, a proportion of the population in the CEE countries still does not have a mobile phone.

Interestingly, the Romanian telecommunications market has been able to stop the erosion of revenues. In 2012, the total value of the telecommunications services market in Romania stood at €3.6 billion, which was almost 3% up year on year (PMR, 2013). The star of the telecommunications industry over the next few years will remain the data transmission and internet services provision segment, which will

record the highest advance in the entire market. The DLISP market will reach the €1 billion milestone in 2018.

3 UKRAINIAN ERP MARKET

Actually all national enterprises have started automation with the implementation of accounting informational systems, using typical the so-called "box" solutions which were very useful at the initial stage partially meeting the demands of management. Thus, it has been successfully completed the computerization of the financial accounting including the automated formation of bookkeeping and calculation of taxes. More perspective seems to be with managerial accounting which under the conditions of automated informational systems is based on practically unlimited analysis and the possibility of operative formation of accounting which, in its turn, is calculated on the basis of absolute and reliable bookkeeping information.

But the problems of automation of supplies, manufacture, distribution, logistics, personnel management, basically the problems constituting the core of enterprise activities and profit are still remain open. Sometimes certain spheres are automated. Such an approach allows some advantages for a certain employee who enables to reduce the number of mechanical errors, the number of routine operations, accelerate their performance. If it is possible, the attempts are made to export/import the data among different informational systems which are to automate different tasks by different technologies. The use of the local approach to the automation problem does not permit to consider comprehensively all the processes that take place at an enterprise and to analyze them from the point of view of systemic analysis.

For Ukraine nowadays, the tasks of the economic growth, increasing of production quality and competitiveness, becoming a member of the world market are most topical. The solution of these tasks without the increase of the quality management and automation of all spheres of economy (state bodies of management, different enterprises and small businesses) is impossible.

The major problem is non-stability of running business in Ukraine which often results in the absence of real long term strategic plans of the

enterprise development. This is a real problem for the use of informational technologies. The fact is that while the informational technology is in use only to solve local tasks and improve some business processes, it does not require the strategic approaches and fits completely the common pattern of national enterprise management when its activities are planned maximum for a year period. When an enterprise wants to implement the ERP system in full scale and not for solving local tasks, then may arise some problems. And the implementation of such a system is a constituent of the business development strategy. If this factor is not taken into consideration by the company the negative consequences are evident. The only way out for this is to agree the strategic goal of the company with the purposes of implementation of the informational system. In any other case the purposes ERP system implementation will have a declarative character, thus the project is doomed to be a failure.

The IT market of Ukraine has been characterized by the consulted Ukrainian experts (Matyas, 2012) as the one market sector in Ukraine that has been developing with highest capacities and speed compared to international standards over the last years. Within the IT sector the telecommunication market has been described to cover the biggest segment with 7% of the annual turnover followed by the hardware market with 25%. The third position is being taken by services with 9% including software developers and outsourcing. A considerable part of the market with 5% of the annual turnover is generated by game developing enterprises in Ukraine (Kuhar, 2013).

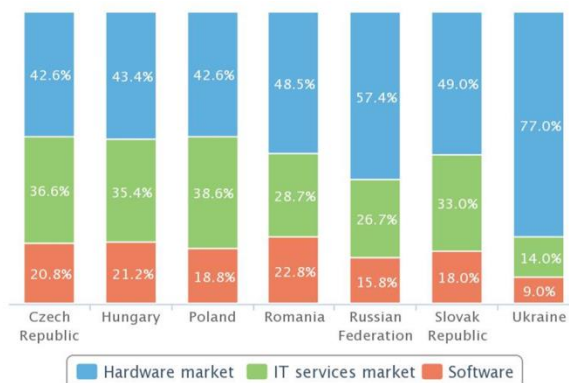


Fig. 1 IT-market structure in selected CEE and CIS countries %, (PMR, 2012)

Taking into account the high volatility of the market development, the market's structure has been forecasted by the consulted Ukrainian experts to develop into the following proportions up to year 2012: hardware – 77%; software (including outsourcing) – 9% and IT services market - 14% (PMR, 2012).

IT-sphere grows very dynamically in Ukraine. The next figure shows part of IT to GDP over last 6 years. Based on the calculations that projected growth in domestic IT industry (35-40% per year) by 2015 we will have 8% of IT to GDP.

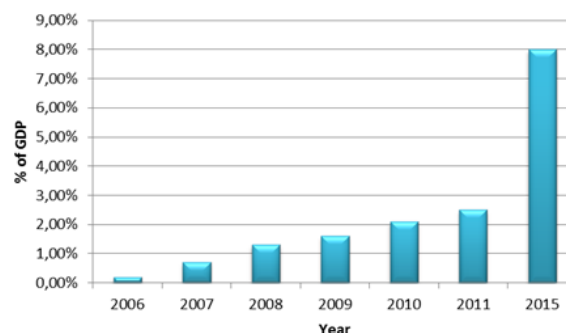


Fig. 2 IT-sphere in Ukraine (Anon, 2012)

The speed of growth of IT-market outperforms GDP growth. This means that the tendency of saturation of the global market, are not typical for Ukraine.

The difference between the issues solved by ERP in the West and in Ukraine, the same as between the goals of a crowded passenger transport: those who are inside want to get a seat as comfortable as possible, while those outside - to squeeze the least at the first stair. From the beginning of 2008 to the end of 2010 Ukrainian IT-market has experienced one of the most difficult periods. Vendors and consulting companies gave an unprecedented discount, offered attractive options of purchase and payment in installments, but in most cases it was extremely difficult to find new customers for implementing ERP-systems. As a result, the sector in terms of money last year decreased by 60-80%. Now it is time to recovery industry. However, it is not the same as before. Segment of the enterprise management system has undergone many changes in quality.

The market of ERP-systems is the part of the information and communication industry, which, in turn, brings together the two main sectors: Communications and Information Technology.

Western ERP-systems (automation of enterprise management) appeared in the Ukrainian market in the early '90s. The first office was opened by the company SAP AG. After it other Western ERP-developers and consulting companies began to work in Ukraine and by the end of the 90 in the Ukrainian market there were present nearly all the leading Western ERP-vendors. After several years of experiments and failures associated with the development of "Ukrainian (post USSR) conditions" (weak regulation and standardization of business processes, a very-very specific kind of accounting and frequent changes in laws) the companies began successful implementation of Western systems, constituting a serious competition to the domestic "Parus" and "Galaxy" (Anon, 2012).

In the early 2000s, the domestic IT market, contrary to global trends, grew at an accelerated rate. In this period ERP-systems were one of the most attractive segments of IT-market. The market of corporate software in Ukraine is also influenced by general economic situation.

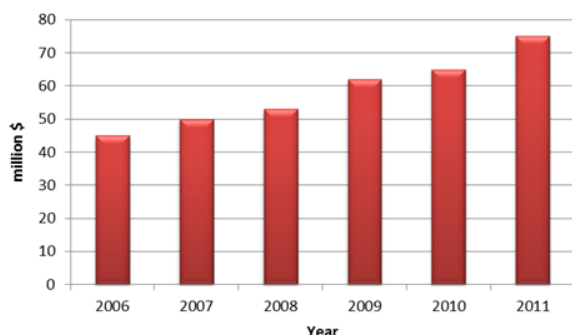


Fig. 3 Ukrainian market of ERP-systems, (Anon, 2012)

A considerable part of incomes within the ERP market is achieved by direct sales. At the same time a significant growth of income from license sales, involved systems and IT consulting support has been. The license sales contributed significantly to the dynamic growth of 2010 and the increase of incomes from technical support of constantly growing clients base was especially pointed out as noticeable for those companies that have been long established within the Ukrainian market, and were able to form a substantial number of customers.

The high demand originating from Ukrainian companies for ERP systems will be continued all through 2014 and even beyond. It was stated that

the important national economic growth in the majority of sectors combined with the estimated political stabilization could stimulate the interest of foreign and native investors for long-term investments into production in Ukraine. It was highlighted that one important factor of increasing ERP system demand is the currently ongoing process of consolidation inside of several economic branches. Newly groups of companies and holdings need sufficient software and licenses in order to allow them to integrate different information systems into one management control system. According to estimations of the Ukrainian IT consulting enterprise IDC a high potential of growth have such ERP systems in industrial sectors within sales and distribution, banking sector and governmental and public administration. The speed of growth of these sectors will be higher than Ukrainian ERP market growth in general, which has been estimated to reach 26% per year until 2015 (Anon, 2012). The governmental and public administration sector has been considered to be the main customer of ERP systems in terms of license volume. Governmental institutions show a lot of interest to systems of corporate management. The realization of large IT projects in customs and rating authorities is expected within a short timeframe (Anon, 2012).

We predict a rise of native enterprise management software with additional functionality (CRM function, supply-chain management, workflow-management etc.). Similar to the ERP systems market we predict this development to come up in the very near future. Some Ukrainian companies are already focusing on this IT market segment such as "Parus" and "Galaktika". The Ukrainian experts highlighted the continuing change of demand from universal management systems towards very specialized industry solutions that take into account peculiarities of the economic fields and involve typical resolving applications of industry specific tasks.

As we see the leader is SAP. The sales exposure to a market of SAP ERP solution in the CIS in 2011 was 52.5%, in 2012 - 53%. There was increasing sales of: business intelligence solutions for the management of procurement and financial management of the company, as well as information management, personnel, etc.

Table 1. The leaders of the Ukrainian ERP-market, % (Verstiak, 2012)

System	Year			
	2012	2011	2010	2009
SAP	53	52,5	50,5	50,1
1S	28	27	26	22,3
Oracle	7,3	6,1	8,2	9,6
MS NAV	6,5	7,6	7,4	7,1
Galaxy	1,9	2,3	2,4	3,9
Other	3,1	4,5	5,5	7

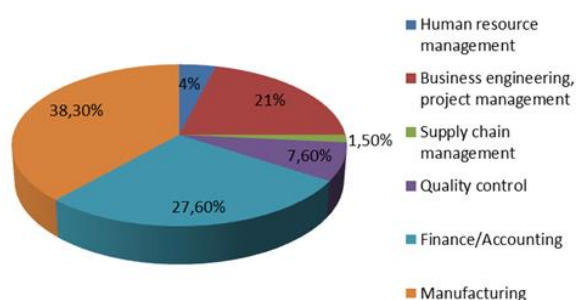


Fig. 4 The modules of implemented ERP-systems (Verstiak, 2012)

The modules of implemented ERP-systems are divided as it is shown on Fig. 4.

4 MAIN TRENDS AND FORECASTS OF THE UKRAINIAN ERP-MARKET

Let us discuss the main trends and forecasts of the Ukrainian ERP-market.

- The high demand from Ukrainian companies in the ERP-system will continue in 2014-2015, considerable growth in most sectors of the economy and political stability will stimulate the interest of both foreign and domestic investors to long-term investments in production.
- An important factor in the demand for ERP-systems is ongoing processes of consolidation within industries: the newly created group of companies and holdings need software that allows integrating disparate information systems into a single management tool.
- The rise of demand of ERP-systems is expected from companies preparing for the placement of shares on Western stock markets and seeking to improve the investment attractiveness for investors through transparent business practices. In 2014-2015 more than 20 Ukrainian companies will spend initial public offering (IPO) which provide an additional impetus to

the development of ERP-market and increased demand for systems that support a Western accounting standards. For the same reasons of transparency the Ukrainian market branches and representative offices of foreign companies form demand for ERP-systems.

- Such industries as retail, banking and public sector have significant potential for growth. The growth rates of these segments will outpace the growth of much of Ukrainian ERP market as a whole. The main candidate for the role of "locomotive" of the market of ERP-systems is considered to be the public sector. Today, government agencies show increased interest in systems of corporate governance. In support we want to mention new SAP customers: "Prominvestbank", "Naftogaz of Ukraine", "Credit Dnepr", "Farmak", and "First Ukrainian investment bank".
- In the near future ERP-systems market is expected to increase the number of domestic management software company, which sold more Internet functionality (CRM-functions, supply chain management, etc.).
- When choosing a partner customers pay more attention for the presence in a consulting company the experience of the success of similar projects.
- Today customers are interested in primarily proven industry solutions used by similar businesses not only in the world, but also in Ukraine. Risks of introduction of such software are much lower than in the implementation of standard ERP-systems.
- With the increasing quantity of implemented ERP-systems we should see the increasing of the demand for maintenance such systems. Sales exposure for companies that provide services to support information systems should be expanded. But in reality we do not see it. For this reason, in many companies on the base IT department own professional teams are formed. These teams are able independently to deal not only with the support of information systems, but also with their adaptation to changing market conditions and business demands.
- One of the bottlenecks impeding the development of ERP-systems market in Ukraine remains a shortage of skilled workers: consultants, programmers, designers of business processes.

Let us suggest strategies in accessing the Ukrainian IT market with a view to minimize potential risks and delays.

We pointed out that opportunity for entering into the Ukrainian IT market for foreign investors have

become more difficult because domestic investors have started to utilize their competitive advantages and do realize intensive market research. Let us list the highest economic perspectives for investment for the following spheres of activity:

- Software Development;
- Software sales, distribution and locally administrated maintenance;
- Hardware Design and Assembly.

On the other hand we must highlight the Program of intensification of investment processes into the Ukrainian IT market, which is carried out by the Ministry of Economic Affairs of Ukraine and does include the following activities:

- forming of government-entrepreneur delegations with the goal of carrying out conferences and presentations in the economic centers of potential customers of Ukrainian IT developments;
- support for Ukrainian private companies through governmental initiatives for participating in first-rate international exhibitions and summits
- support for Ukrainian private companies through governmental initiatives on applying to tender principles with public examination;
- planning and execution of international PR and business awareness programs to establish a Ukrainian branding as country with IT potential;
- editing of legislative acts of Ukraine with the goal of ensuring security for foreign and native investments into the IT industry;
- development of a system of additional administrative privileges for foreign representations (e.g. visa support, regional support initiatives at the level of local authorities, that will provide simplicity and quickness in registration of new branch

enterprises, including 100%-foreign business).

CONCLUSIONS

Considering the fact that Ukrainian IT-professionals have qualifications similar to Russians, and that their salaries are 30-50% lower, it is not surprising that Russia holds the 4th place among the countries where Ukraine's key software development orders are originating due to low international recognition of Ukrainian IT industry and little on-site presence of software development companies. A plenty of individual and consolidated activities are expected in this field in the near future. Also, a significant raise of foreign investors' interest to Ukrainian IT companies and their products international commercialization is forecasted. The neighboring European Union countries and special cooperation status with EU are also deemed as favorable factors for Ukrainian IT-export industry growth. Some positive factors for developing of export IT market are listed below:

- professionalism and high level of qualification of specialists;
- strong research potential and investment attractive innovation technologies;
- relatively low salaries of qualified specialists of the sector;
- stable growth of Ukrainian economics and especially strong increase of export IT sector;
- growth of investment appeal of Ukraine in whole and IT sector particularly;
- neighborhood with EU and competitiveness of Ukrainian hi-tech culture. The most perspective centers for development of IT export capacities Kyiv, Kharkiv, Lviv, Vinnica, Odessa, Crimea, Zaporizhyya and Dnipropetrovsk in terms of already available infrastructure and qualified staff.

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INNOVATIVE MECHANISMS OF REGULATION OF INTERREGIONAL SOCIO-ECONOMIC ASYMMETRY IN UKRAINE

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JEL Classification: **O18, R11, R12**

Abstract

In the article there are analyzed the need for development and implementation of innovation-oriented regional development policy, and development of new innovative instruments of regional development that would be effective in terms of Ukraine's transition to a market economic system, as well as the essence of innovation potential and its place in the structure of the social and economic potential. The article shows the number of scientific theories that explain the dynamics of regional development and, consequently, causes asymmetries that are formed between regions. Here are also analyzed more innovative theories of regional development, the list of specific mechanisms for innovative regional policy, and especially their impact on overcoming inter-regional socio-economic asymmetry in Ukraine.

Keywords: socio-economic asymmetry, innovative potential, innovative model of regional development, regional innovation systems, clusters, "learning region", innovative growth poles, venture capital investments, Spin-off Company

1 INTRODUCTION

Defined strategy of modernization of the Ukrainian economy gradual transition to an innovative model of development initiates solving the problem of providing stable and long-term dynamics of social and economic processes at

the regional level. The process of transformation of the Ukrainian economy, and especially its expression in terms of the spatial organization of the economy of the specific regions determine different directions of mechanisms of influence, which is found to strengthen the social and economic disparities within a single domestic space. Traditional management of socio-economic development of regions under harsh structural changes, caused by the transition to a market economic system and increased competition for resources of innovative

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development, show to be ineffective and cause the need to improve existing mechanisms for regional growth, the development of new innovative instruments, especially those that are linked on to the provision of converged model of development in Ukraine.

In this context there is a need for scientific justification of methodological approaches to the formation of institutional conditions to ensure a balanced development of the region's economy by adapting its business to an innovative model of development.

2 MODELS OF REGIONAL DEVELOPMENT – INNOVATIVE POTENTIAL OF THE REGION

In economics identified two most common models of regional development - traditional (in which the economic growth of the region based on the intensity and effectiveness of such traditional factors as land, labor, capital and entrepreneurial activity) and innovative (according to which the dynamics of the region depends on its ability to successfully use such objective factors as innovation, time and space). If traditional factors designed to meet the constant, implicit, unchanging needs, objective factors relate to the new, acquired, non-permanent, inexhaustible needs.

The advantages of such an innovative regional economic development, based on objective factors of production that are associated with the base, the epoch-making innovations, Russian scientist A.V. Herasymov includes:

- The ability to meet old needs in new ways, as an innovative product or service solves the old problem of the new method (based on innovation capacity is improving innovation);
- The ability to meet new needs in new ways when innovation fundamentally solves the new problems of social and economic development of the region and is the result of the reorientation of the regional economy for the challenges of higher economic structure (the basis of the innovative capacity forms basic innovations);
- The ability to create new needs and satisfy them. This innovation acts not only as the root

cause of the emergence of new demand and new markets, niche markets, industries of various economic sectors, occupations, jobs, etc., but also as a powerful factor in the transition to a higher quality of social and economic functioning of the region (based on innovation capacity is epochal innovation) (Gerasimov, 2011a) (Gerasimov, 2011b).

The results of the study of scientific principles and international experience show critical objective factors in the innovative development of territories as well as their relationship to traditional factors of reproduction. Traditional factors of reproduction of regional economy are considered as relict and superior technical elements of the traditional way (industrial). The basis of the new, which is based on education and information economy, is objective factors such as innovation.

The development of regional economy through innovation growth potential is characterized by a concentration of intellectual resources, the increasing role of information, logistics and environmental factors. The factors of time, space and resources as innovation and competitiveness attribute begin to dominate in the creation of added value, obtaining the maximum rent from mass production and implementation of new technologies, products and services.

With meta-factors for regional economic development linked "innovative capacity", which is a manifestation at the regional level capacity for implementation of innovation, which in its turn is reflected in the various regional development strategies, activities, plans and concrete steps to implement them. In other words this is an ability of the regional socio-economic system to accumulate and effectively implement innovative potential.

Among the main characteristics of the observed increase innovation potential creation of bifurcation points (development) - the state of the critical points of regional socio-economic systems, creating preconditions for the transition to a qualitatively new level of social and economic progress of the regions and territories.

Thus, the innovation potential of the region cannot be considered as one of its components of the socio-economic along with natural- resource,

human, industrial, organizational, informational, geospatial and etc. potential. After an innovative model of regional development is the ability to create and implement innovative tools, products, approaches in each of these segments, which proves its inequivalent other structural elements of the region's potential. A place of innovation potential in the structure of social and economic potential of the region is presented in Figure 1.

Generalized innovative potential of regional socio-economic system can be represented as follows:

$$Ir(t) = \langle K_i(t), I_j(t), P_l(t), U_s(t), E_f(t) \rangle \quad (1)$$

where:

$Ir(t)$ – innovative potential of the region;

$K_i(t)$ – scientific potential i^{th} species;

$I_j(t)$ – intellectual and informational potential j^{th} species;

$P_l(t)$ – industrial and technological potential of l^{th} species;

$U_s(t)$ – organizational and management capacity s – species;

$E_f(t)$ – investment and financial capacity f^{th} species;

t – time.

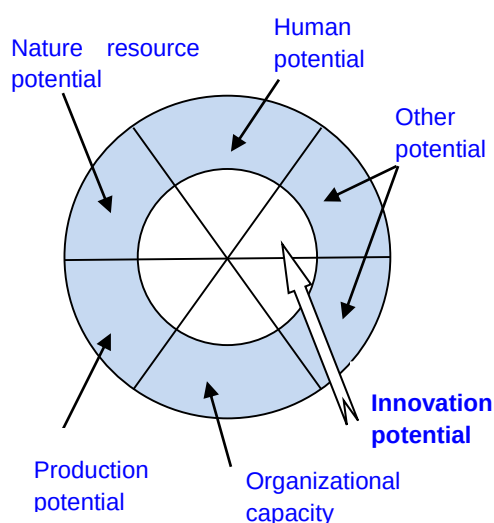


Fig. 1 Place of innovation potential in the structure of social and economic potential of the region (within innovative models of development)

Objective characteristics and its potential regional socio-economic system in this case are the limiting factor according to its innovative capacity. In addition, they determine the speed and intensity of innovative changes in the region, which always occur with a time lag.

The study of the major theoretical and conceptual foundations of regional development allows to talk about the need for building and implementing innovative potential of Ukraine's regions as the only possible direction of development and achievement of competitive position both within the national economic space, as well as in foreign markets. It should be noted that this argument applies to the economically strong regions with relatively high levels of development, and backward and depressed regions.

3 THEORIES THAT EXPLAIN THE DYNAMICS OF REGIONAL DEVELOPMENT

Let us consider the main factors for social and economic growth of regions in historical perspective. Among all the theories that explain the dynamics of regional development and, consequently, causes of asymmetries that are formed between regions can be divided into three areas:

1. Block of theories explaining export specialization and distribution of productive forces (16-20 century) (Luk'yanenko, Poruchnik, & Stolyarchuk, 2008). These include the theory of international trade theory and location of economic regionalization. These theories are rather to study the principles and prerequisites of industrial specialization of regional economies. Of course, you must give credit to the authors of theories who understood and substantiated the reasons for the dynamics of the different regions based on the formation of the relative merits of economic actors and tied them to the terms of localization. But these theories, firstly, are considering only regions in terms of the components of the state's economy, not as independent economic actors, and secondly, do not justify the sources and factors of competitive

advantages in the knowledge-based regional economy, where growth is through innovation.

2. Block of theories explaining the presence of the competitive advantages of the region (the end of 19 - 20.). Prior to this unit the theories are including based on the concept of "new regionalism" of M. Kiting: the theory of "flexible specialization" of M. Piore and Ch. Sabel (Piore, 1984), the theory of cumulative competitiveness of McCombie and Setterfield (Setterfield, 2002) (Shiltsin, 2013), the theory of endogenous growth by R. Martin and P. Sunley (1996). These authors consider national regions as separate economic entities in the international arena and focus on the existence of local competitive advantages. Also, these theories emphasize the role of information growth factor for regional development, and innovations are considered as a tool for improving productivity and accelerating growth of the gross regional product.
3. Block of innovative theories of regional development (mid 20-early 21 c.). The basis of the theory of this unit is an understanding that at the present stage of development of the world economy only through long-term increase of the rate of development of the regional economy can be achieved only through innovations that are considered as a constant process of creation of new knowledge and its implementation in practice. Given the purpose of our research will focus on reviewing these theories in detail.

One of the first theories of innovation orientation of regional development theory became Hegherstrand's "diffusion of innovation" (Pilipenko, 2005). The author showed that the presence of regional asymmetries in a market economy is an immanent phenomenon, since technological progress is spontaneous circulation.

The idea of uneven regional development was developed by F. Perry in the theory of "growth poles" (Perroux, 1995), who argued that innovations are concentrated around key areas that further produces a multiplier effect and forms

a pole of growth, and Jane Jacobs (Henderson, 2001), who introduced into scientific circulation the concept of "region-city" - the local metropolitan area, serving the business hub of economic activity and becomes an arena for regional prosperity.

Since mid-1970s twenty Swiss schools formed their own territorial concentration (under the direction of D. Maya), within which was the concept of "innovation environment", which was interpreted as a group of economic agents who where are able to perceive changes in globalization and encourage the development of localized territorial production system through innovation. In this theory innovation environment is seen as the locomotive of endogenous development. The authors identified five attributes of innovation environment (Maillat, 1998) (Maillat & Grosjean, Globalization and territorial production systems, 1999):

- Spatial unity - geographic space without clear boundaries, but which has a certain unity, manifested through the behaviour of its subjects;
- Players of environment - firms, academic and educational institutions, the territorial government, the public;
- Specific elements as physical (infrastructure) and intangible (know-how, rules of interaction between players);
- Logic of organization, the ability to cooperate with each other efficiently using resources;
- The ability of players to improve themselves.

In the late 20th century considerable attention was paid to scientific study of the mechanism of operation and advantages of the cluster theory of regional development. Its founder, Professor Porter treats the cluster as a group of geographically close of interconnected companies and related organizations that are characterized by common activities and complementarity (Sokolenko, 2004). Establishing networks and technological innovation in the concentration of sources within the cluster can significantly enhance innovation in the territory where it resides.

The most common method of providing financial development and implementation of innovations in production within clusters were venture capital funds. For example, in the USA more than half of biotech innovators organizations are funded by venture capital funds.

The importance of establishing effective innovation systems at the regional level was proved in the theories of creative regions and regional innovation systems (Asheim, Isaksen, Nauwelaers, & Todtling, 2003) (Asheim & Gertler, Understanding regional innovation systems, 2004). The authors linked the dynamics of regional development with an established presence in the region of interaction between institutions of education, science, business and other actors of the innovation process and offered "innovative model of interaction." The researchers emphasize the importance of adequate infrastructure accumulation and diffusion of innovation and reducing communication channels in the transmission of knowledge to direct contacts.

Thus, the innovative theories of regional development consider regions not only as independent economic agents, but also as epicenters of the creation and accumulation of new knowledge, allowing regional economic systems to gain a competitive status in the long run.

Considered scientific principles of innovation-oriented regional development suggest the need for development and implementation of innovation-oriented regional development policy that would provide conditions for the implementation capacity of areas to intensify innovative activities in an integrated and efficient use of resource potential. The essence of innovation-oriented management to achieve the harmonious development of the region is to build a set of control actions based on the use of new methods (including program- target method, a synergistic approach, fuzzy modeling methods, etc.), financial and institutional mechanisms towards ensuring rational proportions reproductive (territorial sectoral and inter-sectoral, investment, resource support, etc.) in their economic, industrial, social and other spheres, as well as creating conditions for

economic modernization and development of innovative activities.

Formation and implementation of specific areas of governance arrangements should be based on principles that provide institutional conditions for reconciling the interests and objectives of all actors of the regional economy , their access to sources of innovative growth, expanding the authority and responsibility of regional authorities in the field of harmonious development of the territory (including through its resource support) that define the role and place of local entities in implementing the strategy of innovation -oriented regional development. In this regard, an important methodological point is to complement existing principles of regional development as follows:

- Compliance with the proportionality of the key sectors and segments of the economy at the regional and national levels, and as a result - reduction of intra-and interregional structural asymmetries;
- Ensuring the growth of economic potential through integration and more efficient sharing of internal competitive resources through increased interaction entities (local, regional, national and global corporations);
- Targeted regulation in order to achieve reproduction proportions of resource flows in the system of public financing, as well as regional markets for goods, services and investments.

4 BASIC INNOVATIVE MECHANISMS OF REGULATION OF INTERREGIONAL SOCIO-ECONOMIC ASYMMETRY

The basic mechanisms of management of innovative development regions are:

1. *The formation and development of regional innovation systems (RIS)*. RIS – is a specific economic system that combines territorial government bodies, business and innovation infrastructure designed to enhance innovation in the region in accordance with the strategy of innovative development of the region and the main directions of innovation policy. The main purpose of creating the RIS is to provide conditions to improve the economic development of the region through effective use of its intellectual capacity,

generation, dissemination and implementation of new knowledge.

Thus, the RIS is an organizational- economic mechanism and the social institution of post-industrial economy, which directs research and development to improve the competitiveness of the economy and social sphere of the region, and companies and organizations - the widespread use of scientific, technical, and organizational development for the production of high quality and innovation. This system is an integral component of the national innovation system and is based on a combination of market competition with the active use of instruments of regional economic and social policies.

2. *Support existing and activation of new clusters of regional and interregional type.* The positive effects of cluster formation is the development of cooperation and partnership between companies, in turn, stimulates the generation of innovation, accelerating the spread of information, activates interactive learning process, reduces transaction costs and thus creates a competitive advantage for the members of the cluster.
3. *More efficient use of the creative potential of the region.* The development of the region on the basis of innovation depends on the ability of the region to accumulate and effectively use the creative potential of the population, respectively, requires the implementation of policies at the national and regional levels, which would be popularized and encouraged people to create, receive and absorb knowledge. A prerequisite for this is the implementation in practice of the concept of "lifelong learning".

Some regions are making great progress in this direction. For their characteristics scientists use the concept of «learning region» and underline the key role of knowledge creation and collaborative learning in providing innovation and economic growth in the region.

4. *Establishing inter-relationships and inter-regional integration.* Interregional cooperation is one of the most effective

mechanisms for activation of innovative processes and investment to implement reliable, innovative projects that can create new centers of economic development, which can be formed around areas of growth opportunities through consolidation of resources and efforts in the implementation of regional projects of common interest.

5. *Formation innovation growth poles in cities with high scientific potential.* A special role in the innovative development of the regions play major cities, which are centers of knowledge management. This is due to the influence of factors such as the concentration of headquarters of major companies and headquarters of multinationals, which promotes the development of business infrastructure and expansion the range of business services, the concentration of a significant number of qualified researchers and developers, contributing to the establishment of close contacts within the city, the presence of more developed significantly higher (compared to other areas) information and communication and transport infrastructure, the concentration of people (especially young people) with entrepreneurial talent in which there are more opportunities to implement within the city. Thus, the action of agglomerating effect occurs.
6. *Formation of a favorable business environment and increase of the investment attractiveness of regions (particularly for venture investments).* Foreign direct investments have a direct impact on the pace of innovation development as involving the transfer in the region of innovative technologies, products, and much higher quality standards, innovative approaches to the management of enterprises, social groups and regions. In addition, the arrival into a region of a number of powerful companies promotes cluster initiatives.

Significant role in providing innovative investment of just playing venture investments are inherently risky to finance innovative projects, and thus serve as the commercialization of innovation. The

presence of regional venture funds directly determines the probability and speed of introduction of an innovative product.

7. *Intensification of regional information and communication infrastructure. The importance of having in a region highly developed IT infrastructure is due to its function within the regional innovation system: the repeater, distributors of new knowledge and information. The importance of this factor has increased especially in view of the information society, which requires the ability of each participant to build interactive innovation processes, interaction and direct contacts in real time.*
8. *Activation of internal labor migration. Regional innovation policy could also encourage mobility of labor, as it is an effective way to transfer skills and knowledge from one local company to another. Another key measure is to encourage the immigration of skilled labor as it brings new ideas and expertise to the region. This can be achieved, for example, through international exchange programs for students, both for those who come to study in the region and those who leave, but will return with new knowledge and experience.*
9. *Promote the creation of Spin-off companies. Government policies can also promote effective transfer of knowledge through the creation of spin-off companies. Spin-off company - a company that is established by entrepreneurs who previously worked in the company of the same or related sectors. Spin-off companies often find themselves successful because based on the accumulated knowledge of their owners. They are usually located near the "parent" company and can be seen as a mechanism to ensure regional economic diversity in new sectors, as based on the knowledge and skills available in existing sectors.*

The effectiveness of innovative mechanisms marked growth dynamics of regional development is directly determined by the

adaptation capacity of the region. It is about the ability of the regional companies, industries and institutions feel the change (market, technological, organizational) to learn, adapt and update their knowledge and expertise, and to develop and improve organizational skills, which together enables the conversion of new knowledge into effective action. The higher the adaptive capacity of innovation of regional economy and social institutional base is, the better the region provides and implements its competitive advantage.

5 CONCLUSIONS

Summarizing these researches of scientific principles for implementation of innovative instruments of regional development should be noted that regional economic development is uniquely determined by the previous retrospective development, that is, hereditary. This suggests that the ability (capacity) to produce the region actively and effectively implement innovations to accelerate the pace of economic development depends on the structure of the economy, the available technology, development of institutional structures, etc. in the region. However, the trajectory of the future economic development of the region is not determined by mechanically previous trajectory. Constantly changing market and competitive conditions, combined with innovative processes, creating new "windows of opportunity" and, hence, potentially new path of regional economic dynamics, as there are new companies, new technologies, products and skills.

There are numerous examples of regions that have managed to turn relative economic decline by restructuring their economies and the use of innovative mechanisms. This restructuring involves a substantial reallocation of resources between sectors, technologies and skills and is fully determined by market demands. But usually it also requires a change in the regional institutional forms and norms of behavior, as they form the innovation and the way in which markets relay changes. The role is potentially weighed and comprehensive regional policy.

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STATE ADMINISTRATION FORMATION OF REGIONAL HUMAN DEVELOPMENT IN UKRAINE

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Abstract

The article highlights the stages of public administration formation of regional human development in Ukraine. Features native methods of calculation of regional human development index (RHDI) are analyzed and the results of their application are assessed. In the context of scientific methods it is emphasized on the minimum set of indicators that reflect key opportunities to provide regional processes of human development. The expediency of using the results of RHDI ratings are motivated for substantial improvements in the efficiency and effectiveness of economy state regulation, primarily to prioritize, scope and structure of the financing components of human development in developing medium- and long-term plans and programs for socio-economic development. The author argues that in the public administration formation of regional human development in Ukraine expenditure responsibilities of local authorities in the socio-economic development of the regions is advisable to specify and regulate on the basis of territorial reproductive processes. The indicators of financing of human development in the region (100 thousand of population) will become sum of local budgets for each component of territorial reproduction processes. Assessment of efficiency, economy and the budget mechanism effectiveness of Human Development Programs financing at the national and regional levels is appropriate to be carried out by the technique of the International Centre for Policy Studies (Ukraine), which was developed with the participation of experts of the Canadian International Development Agency (CIDA). This technique allows us to estimate the potential economic growth of regions and changes in quality of life there. The author proposed a number of measures that are intended to provide further scientific studies, practical testing and implementation of conceptual and methodological provisions of planned analytical work on financing human development in the regions of Ukraine.

Keywords: public administration, state regional policy, Regional Human Development Index (RHDI), budget management mechanism, forecasting, planning, financing, National and Regional Human Development programs.

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1 INTRODUCTION

Ukraine was the first country in Central and Eastern Europe as well as among the CIS countries to adopt the Concept of human development as an organic part of the Concept of



sustainable development on a global and national dimension and a basis of civilized progress (Yaroshenko, Scientific and practical commentary to the Budget Code of Ukraine, 2011).

United Nations Development Programme (UNDP) in 1990 published their annual global report on human development, and estimates human development index (HDI) for Ukraine were first included in the Global Human Development Report 1993, ranking 45th out of 169 countries and territories.

In 1995, it was first published National Human Development Report in Ukraine, prepared under the auspices of UNDP, which from that time prepared every two years.

United Nations Development Programme (UNDP) have been publishing their annual Global Report on human development since 1990, and Human Development Index (HDI) calculations for Ukraine were first included in the Global Human Development Report in 1993, ranking 45th out of 169 countries and territories.

In 1995, it was first published National Human Development Report in Ukraine, prepared under the auspices of UNDP, and that have been preparing every two years since that time.

2 THE STUDY

2.1 Methods of measuring regional human development in Ukraine and results of their application

Public administration formation of regional human development in Ukraine is carried out at the appropriate stages, including:

- preparation of information provision as a part of human development rate stimulators and rate destimulators being grouped by development aspects;
- development of methodical maintenance with indicators definition and algorithms for ratios calculation;
- implementation of registration and accounting of human development indicators in the national statistical base;
- implementation of analytical assessments of national and regional human development ranking political subdivisions.

Nationally, the Human Development Index (HDI) is calculated according to the methodology of United Nations Development Programme (UNDP) for the data on health, education and welfare. Health characteristics is given by the average life expectancy rank at birth, education characteristics is given by literacy performance of adults and enrollment (school and post-secondary) its respective age groups, wealth characteristics is given by GDP at purchasing power parity per capita (Libanova, 2006).

In Ukraine since 1999 it has been calculated Regional Human Development Index (RHDI) according to administrative-territorial system: the 24 administrative regions, the Autonomous Republic of Crimea, Kyiv and Sevastopol.

Methodology for regional human development index is also based on a minimum set of indicators that reflect key features to ensure the whole process of human development in the area: living a long and healthy life (measurement – longevity); acquire, enhance and update knowledge (measurement – education); access to livelihoods, providing a decent standard of living (measurement – the material standard of living). The method of calculation was adopted in 2001.

9 major aspects generalizing indicators of regional human development (demographic development, labor market development, material well-being of the population, living conditions of the population, level of education, and health status, social environment, ecological situation, financing of human development) were determined in calculating RHDI.

Using the proposed technique ensured the validity of socio-economic development comparisons of certain regions of Ukraine, scientific support for the systematic calculation of human development index of regions, the definition of each region on a universal scale, which allows you to perform methodologically correct comparison of both integral index and for each of the 9 indices of certain aspects in human development (Kalachova, 2011).

That is because human development indicators are the indicators of the public sector, they serve as the basis of the formation mechanism of the balanced budget indicators for sustainable

development of the country based on national values.

Every aspect of human development indicators is consistent with a single unit, forming a system of human development indicators in regions. An outline of integral human development index is included with the 3-stage process according to the 3-level hierarchical system performance.

According to the Global Human Development Report, 2010 Human Development Index value of Ukraine was equal to 0.710, which put the country on the 69th position in the world out of 169 countries and territories.

In recent years Ukraine has made progress in human development, as measured by the updated HDI which is to be a summary measure that estimates the long-term progress in three key areas of human development: the ability to live a long and healthy life, access to knowledge and gross domestic income (GDI) per capita.

Between 1990 and 2010 the HDI value in Ukraine increased from 0.690 to 0.710, i.e. 3%, or an average of 0.1% per year. During this period life expectancy at birth in Ukraine has decreased by about one year, mean years of schooling increased by more than two years and expected years of schooling – and more than two years. Gross National Income (GNI) per one person in the country has decreased by 28%.

According to the Human Development Report, 2013 “The rise of the South: human progress Diverse World”, the value of Ukraine's HDI for 2012 is 0.740, which puts the country at position 78 out of the 187 countries and territories. From 1990 to 2012 the value of the HDI for Ukraine increased from 0.690 to 0.740, i.e., 5% or an average of 0.4% per year. Though HDI in 2012 Ukraine belongs to the countries with high human development, this figure is well below the average value of the high human development (0.900).

Human Development Index in Ukraine is below average (0.717) in Europe and Central Asia. “Neighbors” of Ukraine according to this indicator (i.e. countries rated close HDI and population) are Kazakhstan and the Russian Federation, which occupy respectively 66 and 65 in the rankings (Kalachova, 2011).

As a result of ratings in 2011 three groups of regions have been identified taking into account 9 major aspects of the State Statistics Service of Ukraine:

- leading regions , which rank first five places according to the results of the RHDI calculation;
- core group of regions (18 regions) which rank accordingly from 6 to 23 places according to the results of the RHDI calculation;
- regions-outsiders which rank 4 last places according to integral calculations.

First place by a wide margin, according to the 1999-2011 years, surely is occupied by Kyiv, which belongs to the first position by the integral index of demographic development, material well-being, the living conditions of the population, the level of education and human development funding. The next place is the city of Sevastopol (first place in the labor market and health care, the second position by the demographic development, education and living conditions of the population, a high place for financing human development and material well-being). Third place was taken by Kharkov region: the second position in the ranking for the labor market, the third one by level of education; fairly high places in terms of material wealth, living conditions and health. But in absolute terms the index of dominance is not as expressive as the position of Kyiv (0.674).

Kiev region is among the five leaders of the demographic development indices, material well-being, living conditions, education and finance human development. Negative aspects in the general index of the region are the social environment and the development of the labor market.

Poltava region occupies the 4th place for financing human development index and has a relatively large value for the assessment of other units. It should be noted that the area has virtually no components that significantly affect its development.

On the opposite side of the scale is taken by Donetsk region (27th seat), Luhansk region (26th place) and Zhytomyr (region 25th) are far behind the human development index of most regions of Ukraine. It should also be noted that in recent years it has been worsened the position of

Vinnitsa region (2005 21st – 26th places) and Zhytomyr region (25th place in 2010 – the lowest position in all the years of payment). These areas were slightly ahead of outsiders on a single scale of human development integrated regional index in 2011.

In order to stabilize and improve the situation in the social sphere of the last two groups of regions it is a clear need to conduct in-depth analysis of the human development factors for all segments of its hierarchical structure and develop a comprehensive system of social activities aimed at increasing the value of skilled labor; ensuring the right to work, social security, education, health and housing; development of social infrastructure, and the availability of basic social services; supporting families, mothers and children policies.

In 2012 a new measurement of regional human development in Ukraine was approved. Calculation of regional human development index included 33 indicators that combined 6 units in accordance with the basic aspects of human development: reproduction; social status; comfortable life; well-being; decent work; education. Experimental estimates of regional human development by this method have been carried out since 2004.

Calculations of the Human Development Index allow building a single scale, which rank all regions of Ukraine. The exact value of the integral index (or indices that characterize some aspects of human development) has no economic interpretation i.e. it is only important a place that belongs to each region of Ukraine on a single scale.

Because of this, the results of RHDI ratings were used for substantial improvements in the efficiency and effectiveness of economy state regulation, primarily to prioritize, scope and structure of the financing components of human development in developing medium-and long-term plans and programs for socio-economic development.

The strongest influence on determining the location of the region on a single scale index of human development is education, living conditions and material welfare. The least visible is the impact of labor market indicators. Perhaps it is because the indirect labor market situation

determines the location of the region on the scale of the human development index over material wealth and – to a lesser extent – in living conditions.

Based on the results of Human Development Index rating by the State Statistics Service of Ukraine in 2012 the following results were obtained for the 6 main aspects of regional human development.

First place during the years 2004-2009 was held by Zakarpattia region, which occupied the first position by a combined index of comfortable living. In 2010-2012 the first place belonged to Kharkiv region. High grade of this region is explained by the best indicators of education and welfare. The next place is held by Chernivtsi region (the first position on the development of social protection and well-being). Instead, Zhytomyr region (the worst welfare, education, labor market and reproduction), Kirovograd region (low values reproduction and social environment) and Kherson region (low values of the social environment, welfare and reproduction) are located on last place.

Thus, the results of HDI regional calculations can serve as a basis for identifying key issues and priorities of each region. Quantitative values of the index components to some extent also reflect the effectiveness of the public authorities on human development of the region, especially in Ukraine's transition to a parliamentary-presidential model of government building, administrative-territorial reform and the associated increasing role of local public authorities and local governments (Vernadsky, 1988)(Kalashnikova, 2003).

2.2 The public administration formation of regional human development in Ukraine

Differentiation of Regions in Ukraine in terms of human development is the most comprehensive indicator for evaluating the effectiveness of state regional policy which is implemented by the basic building blocks of human development.

Scientific and practical solution of the problems of human development state regulation in Ukrainian regions is carried out as part of programs and socio-economic development, state and local

budgets, as well as in the context of public-private partnerships. In addition to accounting and analytical assessment of actual levels RHD I it is projected the transition to forecasting, planning and financing in the national and regional programs of human development, which should be among the central budget programs at national and regional levels of social and economic processes regulation.

The human development financial component more than any other, characterizes the thrust of national regional policy. It was set up a list of indicators to characterize this aspect in the preparation of the National Human Development Report (every two years) and annual analytical "Regional Human Development", which characterize the amount of social expenditures of local budgets, the structure of local budgets and transfers to the State budget:

- local budgets disbursement for education, UAH per person;
- local budget disbursement on healthcare, UAH. per person;
- local budget expenditures on social protection, UAH per person;
- the State budget transfers, UAH per person;
- the share of education disbursement in total social expenditures of local budgets, %;
- share of health expenditure in total social expenditures of local budgets, %;
- share of social protection expenditures in total social expenditures of local budgets, %;
- correlation of State budget transfers to social expenditures of local budgets.

In the public administration formation of regional human development in Ukraine expenditure responsibilities of local authorities in the socio-economic development of the regions in accordance with the administrative-territorial system of Ukraine is advisable to specify and regulate on the basis of the following classification of territorial reproductive processes including:

- the material base reproduction of social services (housing, utilities, education, health, social protection and social security, culture, art, media, physical culture and sports);
- reproduction of communication objects, telecommunication and information;
- reproduction of production and road transport infrastructure;

- protecting the environment and ensuring integrated and sustainable environmental management.

Formation of the innovative Ukrainian society in the future will be based primarily on generating and using new knowledge. Therefore, social investment in intellectual capital will turn into the most efficient way of placing state and local budget resources (Yaroshenko, Scientific basis for further development and improvement of the conceptual provisions of the revised Budget Code of Ukraine. Scientific and practical commentary to the Budget Code of Ukraine, 2011).

2.3 Budget management mechanism of national and regional human development

The modern Ukrainian realities have paradigm shift preconditions in budget management mechanism of national and regional development for the transition from the application of the theory of employment, economic growth and material prosperity for the use of terms and concepts of human development indicators. Thus the socio-economic development figures of the region are not only a function solely of natural resources, capital, organizational and technical factors, but also an outcome of the social capital – education, health, culture and historical heritage of the population, awareness and implementation of cleaner production management in business activities and more.

Regions differentiation in Ukraine in terms of human development is the most comprehensive indicator for evaluating the effectiveness of state regional policy, which is implemented by the basic building blocks of human development: public health and demographics, education and development of the education system, labor market conditions and standard of living.

Targets figures of socio-economic development of the region and the national economy, as a whole are figures of life standard and quality level. That they are the best to reflect the adequacy of the social orientation of all the changes taking place in the region.

The standard of living – is a composite index that characterizes the material and spiritual achieved needs of individuals and society as a whole,

reflecting ultimately the well-being of the population. Moreover, the structure of the material and spiritual needs of man is adequate to the structure of human activity by starting point and the goal.

Life standard is a socially accepted standard of living. In some countries there are official specific life standards of living and, in addition, each social group and community and well everyone has their own subjective standard. Life standard also changes over time, but this change occurs as discrete qualitative change in the socio-economic system.

Quality of life is the value of life and the accepted standard. This criterion shows the degree of needs satisfaction, and as needs arise only if there are potential opportunities, and quality of life actually reflects the equilibrium level of socio-economic systems and characterizes the level of social tension.

Ideally, management of social and economic development must be based on the objective function, which is an indicator of quality of life in balanced budget mechanism.

Implementation of the revised Budget Code of Ukraine (2010) is focused on the use of social groups in the formation of a new budget mechanism balanced by state management on the basis of the national system of values that will ensure the preservation of various individual characteristics of the population in each region, its moral principles: spirituality and education, historical heritage and territorial integrity, customs and traditions, culture, and philosophy, peaceful mentality and ethical values, as well as inter-emergent regions development as a single organic unit (Yaroshenko, Scientific basis for further development and improvement of the conceptual provisions of the revised Budget Code of Ukraine. Scientific and practical commentary to the Budget Code of Ukraine, 2011).

Balanced management of sustainable state development on the basis of national values involves, in the future, the determination of maintenance costs and reproduction of the material resources and social infrastructure of a particular region to be supplied with their own financial resources that are accumulated in the local budget and transfers from the state budget

were mainly appointed for ensuring common standards of living in different regions of the state with a focus on the implementation of EU social standards.

That is, if the priorities of socio-economic development of regions, districts, cities and towns is determined by the Programme of human development in region, then the formation of finance local sources will be determined in accordance with the local authorities expenditure responsibilities to ensure local economic cycle of reproduction processes. And the rates of funding of human development in the region (100 thousand people) are local budgets expenditures for each component of the local reproductive processes.

Assessment of efficiency, economy and the budget mechanism effectiveness of Human Development Programs financing at the national and regional levels is appropriate to be carried out by the technique of the International Centre for Policy Studies (Ukraine), which was developed with the participation of experts of the Canadian International Development Agency (CIDA).

This technique allows us to estimate the potential economic growth of regions and changes in quality of life there. In the current study the benchmarking was conducted for 36 indicators, 6-9 per each of the areas. Indicators are selected in such a way as to describe the most important parameters in that area, measuring resources, the costs, efforts and policy outcomes. And 63 countries was the value of the sample for comparative analysis.

First, the factors affecting the change in the capital stock (investment incentives, the movement of foreign capital and tax policies) are analyzed as well as labor supply (especially demographic factors) and total factor productivity (education, health, research and development, etc.). Further, the changes in the quality of life assessment in the regions to be carried out and which are based on the following definition of the relevant fields, parameters and indicators.

Welfare area is characterized by the following parameters (economy, efficiency, innovation) and by indicators (GDP per capita, unemployment, business climate, energy efficiency, information, research funding, and availability of scientists).

Society area is reflected by the following parameters (roughness, security threats) and indicators (income inequality, gender inequality, the number of murders, and the number of robberies, demographic stress, unemployed youth, and corruption).

The health system area includes the following options (health, morbidity, and lifestyle) and indicators (life expectancy, the gender gap in life expectancy, infant mortality, the HIV incidence, TB incidence, health care financing, medical supply, alcohol consumption, smoking tobacco).

The education area is characterized by the parameters (money, resources) and indicators (the number of foreign students, the schooling years average, corruption, education funding, teachers supply, the labor force with higher education).

Environment area is displayed by the loading parameter and indicators: greenhouse gases, CO₂ emissions, SO₂ emissions, NO emissions, water quality, and the impact of the environmental situation on life duration, protected areas, and environmental regulation.

We know that over the last 30 years in developed countries there is to be high social factors productivity (SFP) that provides 1/3-1/2 GDP growth, and is characterized by a greater influence on the output of goods and services compared to the “classical” factors – labor and capital.

The benchmarking results identified four leading regions – cities of Kyiv and Sevastopol, and two areas – Kharkiv and Zakarpattia. Meanwhile, as the first place by Kyiv is not surprising thing, the region leaders took the first places due to acquisitions only in some areas of quality of life. For example, Zakarpattia region, having the second lowest GDP per capita, obtained good results in the *public health area* and *society area*. Kharkiv region showed strong indicators in *education* and *welfare*.

Improving the quality of life in the region is not possible without the active involvement of local governments. Government initiatives and local authorities of regional cohesion are designed to help the outsider regions, on the one hand, and preserving incentives for the development of leader regions – on the other.

It is well-known that social development index is formed by averaging the three global indices: Quality and Safety of life Index; Human Development Index; Society Index based on knowledge, or K-society.

Considered conceptual position of forming a regional system of human development that is proposed to assess by Quality and Safety of life Index.

Quality and Safety of life Index is formed by the following nine indicators: GDP per capita in purchasing power parity; population life expectancy; political stability and security rating; number of divorced families per 1,000 population; public activity level (activity of trade unions, NGOs, etc.); difference with latitude between climate warmer and colder regions of the country; unemployment rate of the country; level of political and civil liberties in the country; the ratio between the average wages of men and women.

Human Development Index is formed by three indicators: population life expectancy; level of the population education and standard of living, as measured by GDP per capita at PPP.

Society Index based on knowledge, or K-society Index is defined by three main indicators: the intellectual assets of society; the future development of society and the quality of society. In turn, these indicators are formed by using 15 sets of data on the coverage of youth education and information, investment climate in the country, corruption, inequality and the distribution of social benefits, child mortality and others.

Thus, the introduction of the revised Budget Code of Ukraine, using principles and indicators of Conception and Human Development Programs, has appropriate methodological, analytical and information support. The orientation in fiscal policy on the continued expansion of opportunities to meet the physical and spiritual needs of the Ukrainian people is an irreversible path of social progress of our country, which confirms the high dynamism and improvement of the budgetary process.

3 CONCLUSIONS

Further scientific studies, practical testing and implementation of conceptual and methodological provisions of planned analytical work on financing

human development in the regions of Ukraine provide:

- standardization and improvement of appropriate stimulant and destimulant indicators, their indicators for the evaluation and analysis of human development component, the structure of their relationship, algorithms and methods of calculation;
- regulate the manner and timing of rating assessments of human development trends in the region, as well as the relationship between human development status and practice of funding from state and local budgets;
- prioritization of human development at the National and Regional Programs, the structure of their relationship on the basis of construction of intersectoral balance or scheme where the priority indicators are their purpose while being the indicators of social efficiency in other budget programs;
- development of information and statistical support planning, analysis and control funding of all human development components at the national and regional levels.
- Forecasting functions, programming, planning and financing introduction is preceded by designing and setting up the components of economic organizational mechanism as the basic subsystems of human development public administration in Ukraine (Yaroshenko, Scientific basis for further development and improvement of the conceptual provisions of the revised Budget Code of Ukraine. Scientific and practical commentary to the Budget Code of Ukraine, 2011). In particular, it is assumed that:
 - the Cabinet of Ministers of Ukraine is the development organizer, coordinator and responsible executor of the National and Regional Human Development programs, and the Ministry of Finance of Ukraine is the main budget funds manager of these programs;
 - human development aspects of at the national and regional levels are features of subprograms in the National and Regional Human Development programs;
 - every aspect of human development indexes corresponds to a single unit, forming a of the National and Regional Human Development programs;
- the National Human Development program financing is carried out by the State Budget of Ukraine , hence Regional programs is carried out by the State and local budgets in Ukraine;
- the National and Regional Human Development programs are consistent with the strategic objectives of socio-economic development of the state and the regions for the following two periods of the planned;
- the budget policy for the next budget period is based on forecasting and policy instruments for economic and social development and should incorporate the objectives of the National and Regional Human Development Programs, which are substantiated in The Cabinet of Ministers of Ukraine;
- key budget spending units clarifies the main purpose of the activities and form budget requests based on the needs of the tasks of the National and Regional Human Development programs and subprograms according to their mission;
- Ministry of Finance of Ukraine analyzes budget requests of budget spending units in accordance with the objectives of the subprograms to the objectives of the National and Regional Human Development programs;
- State Budget of Ukraine and Socio-Economic Development Program includes the analyzes of National Report «Human Development in Ukraine» and analyzes «Regional Human Development» for prior periods as compared with other countries, and also projects of the National and Regional Human Development programs that train and develop the Ministry of Economic development and Trade of Ukraine, Ministry of Finance of Ukraine and the State statistics Service of Ukraine with the National Academy of Sciences of Ukraine;
- projects of the National and Regional Human Development Programs are based on a list of key issues and priorities of socio-economic development of the planning period, and the medium-term prospects, which are initiated and justified

- by central and local executive authorities and local government;
- calculation results of RHDI components to some extent reflect the performance of activities of state and local authorities and local governments for reproduction of the human potential of the region;
- correlation analysis of the state budget social transfers to social expenditures of local budgets allows to assess the level of state financial self-reliance and local executive authorities and local government in human development;
- simple reproduction of the human potential of the area in Regional Human Development Programs is carried out within their own financial resources of local governments, and advanced playback is carried out within the National Human Development Program based on transfers from the central to local government;
- the calculating results of Regional Human Development Index (RHDI) is the basis for identifying key issues and priorities of socio-economic development of each region;
- an effective regional development strategy formation provides the inclusion of indicators in the Regional Human Development Programs:
 - covering all levels of education areas that characterize the education equality of each age group;
 - the developing the living conditions of the population;
 - improving welfare.
- social transfers in the state and local budgets relations are intended to ensure common standards of living in different regions of the state;
- scope and structure of transfers from the central to local budgets are based on comparative assessment of socio-economic development of Ukraine: demographic development; the labor market; material well-being of the population; living conditions of the population; level of education; status and health; social protection; environmental situation;
- the National and Regional Human Development Programs projects should include a comprehensive system of social activities aimed at:
 - increasing in the cost of skilled labor;
 - ensuring the right to work, social security, education, health and housing;
 - developing of social infrastructure and accessibility to basic social services;
 - supporting policy of families, mothers and children;
- effectiveness of state and private partnerships and budget funding mechanism of the financing human development is estimated by potential regional growth and changes in quality of life there.

The legal regulation of scientific and methodological support of state administration formation of regional human development in Ukraine is scheduled to be carried out by clarifying and amending the Verhovna Rada of Ukraine, especially the Budget Code of Ukraine, Laws of Ukraine “On Local Government in Ukraine” and “On Local State Administrations”.

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ECONOMIC SECURITY OF SMALL AND MEDIUM ENTERPRISES

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Abstract

The paper analyzes the determinants of business success for SMEs. On detail of 131 businesses there were analyzed changes in business objectives and functions, differentiation factors, business economics and economic security of small and medium-sized enterprises. In the next part of this paper there are designed critical infrastructure and indicators of economic security of companies. In that context, there was proposed organizational strategy to application of critical infrastructures and indicators of economic security of companies.

The conclusion justifies the need to set out economic security of small and medium-sized enterprises.

Keywords: economic security, critical infrastructure, thresholds of critical infrastructure, indicators of economic security determinants of economic growth.

1 INTRODUCTION

Business entities in the Slovak Republic found themselves before a nation-wide requirement to increase the economic efficiency of enterprises and self-governing units on the one hand and to protect and stimulate the national economy from the global financial and economic crisis on the other.

The second problem is the need for efficient and sustainable use of non-renewable resources for the needs of the population in a sustainable environment.

The third problem is the social development of communities and increasing employment of the population, while ensuring rational nutrition and energy consumption per capita.

SMEs therefore are faced with a difficult task to solve these problems in the application of austerity measures and minimalization of socially necessary costs of production. After all, small businesses participate in the employment of the economically active population with 66% and on a gross domestic product (GDP) with almost 70%. (Gozora V. , Regionálne disparity v ekonomickom a sociálnom prostredí Slovenskej republiky, 2010)

Prerequisite for the successful application of the declared content of problems is economic security and sustainable development of small and medium-sized enterprises.

Therefore the aim of this paper is to assess the level of small and medium businesses, identify determinants of non-balanced conditions and to characterize the function of critical infrastructure in achieving economic security of business subjects. Finally, to design the indicators of the economic security of small and medium-sized enterprises.

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2 METHODOLOGICAL PROCEDURE

Realization of that objective sought to conduct a review of the file 131 SMEs in all regions of Slovakia. Other data were obtained from the Statistical Office of the Slovak Republic and from factsheets of Ministry of Agriculture and Rural Development of the Slovak Republic.

From the content point of view, we focused on the survey at:

- determinants of business success of SMES,
- imbalances in business subjects and their causes,
- assessment of critical structures in achieving of business subjects security,
- assessment of economic security by business subjects.

In developing the paper we used the methods of interrogation, questionnaire, and methods of analysis, synthesis, deduction and human judgment.

When evaluating enterprise groups, we used comparative method and conventional graphical methods and numerical calculations.

3 DETERMINANTS OF BUSINESS SUCCESS OF SMEs

In the last 30 years we have witnessed significant societal, social and natural changes. Gradually there is changing natural, economic and social environment of rural environment, there are changing community and ownership relations, material consumption is increasing and modifies the social consciousness of the population. Especially the rural population has undergone a complex cultural and social restructuring, in which there emerged new social features and the order of social values changed in the new

emerging socio-economic formation. (Gozora & al, 2009)

Hi-tech society was replaced by the knowledge, economic and developing information one. Human's attitude to the environment has changed. Significant changes occurred in the corporate-economic base. Original business and economic types of businesses were replaced by new economic types and sizes of enterprises.

Dominant position in the structural composition of businesses there take small and medium enterprises that carry out their activities as legal or natural persons (see Table 1).

From a macroeconomic perspective, the development of SMEs in specific environment was very complex and differentiated both on regional and local levels. There contributed to these changes not only the turbulent economic environment, but also new principles of corporate management and the change of the economic mechanism.

3.1 Changes of Business Objectives and Functions

Changes in the business environment and the transition to a market economy made it necessary to revise the main objectives of the company, which have been designed to meet consumer demands and maximize corporate profits, the sustainable development of the company and the external environment to support the business. Social development so far confirmed the eligibility of those objectives, although in a world increase strong voices leading to representatives of management that it is necessary to abandon maximum profit and replace it with the reasonable profit.

Table 1 Development of SMEs - legal entities

Business subjects/Year	2006	2007	2008	2009	2010	2011	2012	2013	Index 2013/2007
Micro (0-9)	70908	80899	95010	102926	130144	112753	120833	132646	1.87
Small (10-49)	12956	17212	21226	20899	9549	13485	108522	98411	7.60
Medium (50-249)	2938	2805	3024	2926	2724	2761	2573	2576	0.88
SMEs totally	86802	100916	119260	126751	142417	128999	134258	233633	2.69

Source: Statistical Office of the Slovak Republic and author's own calculations

The more significant changes occurred in the number, structure and order of business functions. Indeed, a majority of production-economic function was replaced by bio-economic function as an unmistakable sign that our society pushed in business wholesome products, adequate environment, and the requirements for environmental safety of the population. Between business functions is inevitable business and economic self-governing function

3.2 Differentiation factors of Business Economics

Despite of the political decisions and power structures supporting the development of small and medium-sized businesses it did not get the required quantitative and qualitative level. SMEs adjusted rapidly to a developing market economy and increased productivity of laborer, but the lack of start-up capital, high debt, low liquidity and often intermittent cash flows negatively affected economic efficiency of SMEs.

This is caused under Klasekova, M. (2012) by a weak credit rating (25.6%), lack of equity (24.00%), absence of lien (12.40%) and other causes (38.00%). To the above determinants must also be attributed the negative impact of the informal economy, which is the result of activity of large corporations and multinational companies. Despite that SMEs have become the driving force of the Slovak economy.

The year 2004 was a breakthrough year of the Slovak economy. Slovakia's accession to the European Union formed the conditions for sustainable development of small and medium-sized enterprises and to address regional disparities in economic and social environment, but strong orientation of chain stores to foreign products and effects of the global financial and economic crisis formed conditions of non-balanced economic and social status of numerous businesses.

Whole industries and sectors of the national economy got to non-balanced status or sedation and the resulting macroeconomic indicators previously document persistent long-term economic stagnation of the country. Similar view on this issue we can see in Hudakova and Kučera's: Solution of non-equilibrium conditions in agriculture (2009).

Table 2 Causes of Failure of SMEs in Obtaining Credit

No.	Cause	Percentage of Enterprises
1	Permanent credit rating	25.60
2	Lack of capital	24.50
3	Absence of lien	12.40
4	Unknown reason	13.30
5	Other reasons	24.70
1-5	Totally	100.00

Source: Klaseková (2012) and author's own corrections

From January 1, 2013 a package of measures to enhance revenue to the state budget negatively signed under the economic situation in Slovakia. Significantly there were reduced employers' organizations, the self-sufficiency in food production and increased unemployment of rural population. It follows that there wasn't created a healthy business environment to traders. Missing macroeconomic regulatory systems to support the business environment and other macroeconomic safety features of the Slovak economy.

4 ECONOMIC SECURITY OF SMALL AND MEDIUM ENTERPRISES

Small and medium enterprises are the most vulnerable part of corporate economic base. Despite numerous recommendations on methodologies and scientific research institutions restoring of SMEs significantly fails. There lag integration and diversification of production processes and equity portfolios. Creating of strategic alliances and business networking is still at an early stage. A similar conclusion reached Gozora, V. et al. in addressing regional disparities in small and medium enterprises. (Gozora & at al, 2013)

According to those authors, the economic security of business entities is determined by disposable, material and financial resources, effective organizational structures of production and business management, the level of human resources. Last but not least is conditional by sales and encash of products in time and by reducing the cost of storing supplies, early identification and addressing of business risks.

Business risks and economic security of businesses needs to be addressed by monitoring and early identification of potential outbreaks of unbalanced state. For this purpose, there can be used proven methods of health assessment businesses:

- financial analysis ratio,
- Altman's test of credibility of the business subject,
- quantification of the creditworthiness of the company,
- valuation of market share, brand and business subject goodwill,
- comparison of businesses in comparable conditions.

Economic security of enterprises can augment by the application of critical infrastructures with normative indicator, upgrading of staff structures, optimal utilization of the human potential, and optimal reward system based on job performance.

Effective methods of sustainability of economic security of small and medium-sized enterprises is the optimal amount of labor and social costs on administrative overhead and maintaining the security of information systems of the enterprise.

4.1 Critical Infrastructures and Indicators of Economic Security of Enterprise

In accordance with the Law on critical infrastructures Act No. 45 of February 8, 2011 on critical infrastructure (Narodna rada SR, 2011) critical infrastructures have become a part of the economic methods and tools to achieve sustainable economic imbalances of businesses. Although the majority of small and medium-sized enterprises stood skepticism to the generalized application of critical infrastructure for enterprise-economic base, there were a lot of supportive comments of company managers to exploit critical infrastructures in small and medium-sized enterprises.

The survey results on detail of 131 businesses confirm our investigation, as it is shown in the Table 3. Nearly 41.98% of managers in surveyed firms have not adopted it or do not consider appropriate to introduce the corporate practice of

critical infrastructure. However, more than 48.80% of senior executives from a largely prosperous enterprises can sees in application of critical infrastructure systems the way to achieve economic security and sustainable development in small and medium-sized enterprises. For this reason, we support the use of critical infrastructures to achieving sustainable economic security of small and medium enterprise in Slovakia.

In that context, we propose to achieve economic security of the enterprise by organizational strategy consisting of the following steps:

- Step 1** - Identify key problems and barriers to economic development of businesses.
- Step 2** - To rationalize the corporate structures and in-house management system.
- Step 3** - To identify areas of critical infrastructures of SMEs.
- Step 4** - Carry out the selection of thresholds of critical infrastructure of businesses.
- Step 5** - To perform simulation of normative management in business practice.
- Step 6** - To eliminate business risks on business, local and regional level.
- Step 7** - Via indicators of economic security periodically check health condition of enterprises and keep thresholds of economic security of enterprises.

4.2 Indicators of Economic Security in Enterprises

Economic security of enterprises is necessary to check via indicators of economic security. Comparing of border standards and normative values of the economic security it is approximately possible to indicate economic condition of the enterprises and their degree of economic security. On long lasting experience, knowledge and business assessment methods we suggest to use these indicators of economic security of enterprises.

Indicating of economic security in optimal values indicates good health, adequate financial burden and sufficient own funds of enterprises. Finally, it indicates activity of enterprises and business market share. (Strelcova, 2013)

Table 3. *Survey on Respondents to the Application of Critical Infrastructures in Small and Medium-sized Enterprises*

Alternative	Title - response	No.	%
1	I do not agree with the application of critical structures in enterprises.	34	25.95
2	I rather do not agree with the application of critical structures in enterprises.	21	16.03
3	I rather agree with the application of critical structures in enterprises.	18	13.74
4	I agree with the application of critical structures in enterprises.	46	35.11
5	I do not know.	12	9.27
Totally		131	100.00

Source: author's own findings

Table 4 *Indicators of Economic Security of Enterprises*

Indicator	Optimal range/ value
Cost rate of return in %	Over 10%
Indebtedness of the company	20-70%
Turnover of capital in the days and years	Increasing
Labor productivity of net value added	Calculated per employee
Cash flow- profit	In euros
Potential market share	In %

Source: the author

5 CONCLUSION

Our results show a low level of economic security of our businesses. Most small and medium-sized enterprises reaches the minimum rate of return and the cost of labor productivity from added value. Nearly 87% of businesses financially indebted and achieves a lower degree of liquidity commitments.

It turned out that one of the causes of that condition are inefficient corporate structures,

inadequate sales of products and low price of products. Finally, it is inefficient in-house management and irregular evaluation of production and economic performance of enterprises.

Having said that there is a need for the application of critical infrastructures and limits of economic security of companies.

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SOLUTION OF TRAVELLING SALESMAN PROBLEM FOR WHOLESALE OUTLAYS CONSIDERING REPEATED VISITATION OF CERTAIN SALES OUTLETS

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Abstract

This paper presents the solving of the travelling salesman problem with repeated visitation of several outlets. The genetic algorithm was used as a technique for the finding the shortest route in the case of visiting every destination point. The three cases are described in the present research: the solving of the Euclidean travelling salesman problem, the solving of the travelling salesman problem considering the region transportation network and the solving of the travelling salesman problem with repeated visitation of some sales outlets. The solving algorithm which involves partitioning the route into sections without repeated visits to sales outlets has been proposed. Obtained results were combined into one which was considered as optimized for a given route. As a result of our investigation we have proposed the optimized routes that are up to 29% shorter than the actual ones used by the wholesale trade enterprises. As we can see this methodology provides a significant reduction of the transportation expenses of such organizations.

Keywords: travelling salesman problem, genetic algorithm, near optimal route, wholesale outlays

1 INTRODUCTION

Maintenance and advancement of sales outlet's competitive position on the market is one of the main conditions of its existence and successful functioning at the present stage of economy development. It is obvious that formation of long-term stable competitive advantages of business is impossible without complex analysis of the suppliers, consumers, resellers and competitors.

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However, the basic attention of the company management should be paid to increasing the internal efficiency of the enterprise. This becomes possible due to the decrease of current expenditure that is the greatest part of operational activities expenses for a wholesale mercantile business. The problem of decreasing current expenses, particularly the transportation ones, is analyzed in this research for the group of enterprises of Chernivtsi oblast of Ukraine that deal with wholesale trade.

As the majority of such businesses arrange interaction with retail companies with the help of

travelling sales agents, the problem of minimizing their transportation expenses is similar to the classical travelling salesman problem (TSP).

The TSP has proven to become classical since it was first mathematically formulated by Karl Menger in 1930, about a century ago. Among the publications devoted to this subject (Goodman & Hedetniemi, 1977) should be mentioned. The problem statement and several algorithms of its solution are presented in it. Nowadays the solution of this problem has rather a theoretical value for the scientists than a practical one, as it serves as the basis for developing new optimization algorithms, for instance, (Bi, Dong, & Ma, 2012). Still, the practical side of the TSP is even more interesting as it has a large number of applications from direct allocation, incorporated in the routing task (Kouki, Chaar, & Ksouri, 2009) to DNA problems (Zhong, 2003).

Despite great development of this problem, the TSP remains open for many businesses dealing with wholesale trade. This is mainly due to the fact that the TSP in its standard version seldom occurs. There are often additional constraints that should be taken into account while searching for optimal route for the sales agent visiting sales outlets in the process of products distribution.

The aim of this research consists in formulation and solution of the TSP for a trade business considering the transportation network and possibility of repeated visitation of certain sales outlets. The results of such investigation will enable to reduce transportation expenses of the business' operational activities, and thus – to increase the profitability and competitiveness of the business.

2 THEORETICAL ASPECTS

2.1 The Travelling Salesman Problem

The TSP is a classical problem of combinatorial optimization consisting in the search of the shortest closed route that passes once through all specified points and returns to the initial point. The location N of the destination points and the matrix of the distances (or transportation costs) C between the points are known. Mathematically this problem can be presented as follows:

$$\begin{aligned} Q(x) &= \sum_{i=1}^N \sum_{j=1}^N c_{ij} x_{ij} \rightarrow \min, \\ \sum_{i=1}^N x_{ij} &= 1, \forall j = \overline{1, N}, \\ \sum_{j=1}^N x_{ij} &= 1, \forall i = \overline{1, N}, \\ x_{ij} &\in \{0, 1\}. \end{aligned} \quad (1.1)$$

More detailed information about TSP theory and applications is presented in (Davendra, 2010).

Despite the fact that such problem statement is logical and clear, the TSP is rather hard to be solved; that is why it belongs to the class of NP-complete problems, i.e. its calculation complexity grows exponentially with the number of parameters. For instance, even for 15 cities the number of routes to be considered in order to find the shortest one is 43,589,145,600. It is obvious that, while solving the real optimization problems, there is much greater amount of points that should be visited. In such a case, the search for not an optimal solution, but a near optimal one is quite sufficient. Generally, the heuristic methods are used for that. These methods do not guarantee the best decision, but are comparatively fast and produce acceptable solutions due to certain criteria enabling, in some cases, to find the solutions of optimization problems that are impossible to be solved using conventional numerical methods.

The heuristic methods also include genetic algorithms (GA) (Nilsson, 2003) and GA is a variant of meta-heuristic methods, the peculiarity of which lies in careful study of the most perspective parts of the solution space. The quality of the solutions obtained is higher than that of classical heuristics.

2.2 Application of Genetic Algorithm to Solve the Travelling Salesman Problem

The main idea of GA was substantiated in the research work by J. Holland (1992) and developed in the monograph by D. Goldberg (1989); the main results and fields of application of genetic algorithms are presented in these works.

The principle of GA is based on the processes occurring in living nature due to evolution and reproduces Ch. Darwin's idea of natural selection (Bi, Dong, & Ma, 2012). GA is used for solving optimization problems by random selection, combination and variation of the desired parameters. The solution in GA is represented by the chromosome of the individual in the population (solution set); for the TSP particularly the chromosome is represented by the rearrangement of n numbers (numbers of destination points) in the order of their visitation. GA applies such main genetic operators: reproduction operator, crossover operator, and mutation operator.

3 EMPIRICAL STUDY – SOLVING THE TRAVELLING SALESMAN PROBLEM WITH GENETIC ALGORITHM

3.1 Searching for Shortest Route without Consideration of Transportation Network

The TSP was formulated and solved on the basis of the materials of a group of commercial businesses of Chernivtsi oblast (Ukraine). The wholesale trade businesses act as mediators

between the manufacturers of the products and retail trade businesses, which already work with end consumers. Distribution activity of wholesale trade companies is organized in the following way. The sales agents, working with specific sales outlets, daily visit a certain set of them, and this set is cyclic. Having taken the products order, the agents return to the warehouse. Next day, according to the obtained orders, the goods transport delivers the products to sales outlets.

As the fuel expenses of sales agents are compensated by the company, the task of minimizing the distances covered by the agents, as well as the transportation expenses of the company in the process of its operational activities proves to be interesting. Thus, we have a TSP in its classical form: we must find the shortest route of visiting all the sales outlets per day with the following return to the initial point. The information concerning the lists of sales outlets that should be visited by each agent daily and geographical coordinates of these points is given. The list of sales outlets for the k -th sales agent on the m -th day of the cycle is presented in Table 1.

Table 1. List of sales outlets of the k -th sales agent on the m -th day of the cycle

Sales outlets	Geographical coordinates (degrees)		Sales outlets	Geographical coordinates (degrees)	
	Latitude	Longitude		Latitude	Longitude
Sales outlet No. 1	48.2541	25.9630	Sales outlet No. 12	48.2601	25.9539
Sales outlet No. 2	48.2663	25.9452	Sales outlet No. 13	48.2569	25.9295
Sales outlet No. 3	48.2575	25.9296	Sales outlet No. 14	48.2646	25.9466
Sales outlet No. 4	48.2599	25.9513	Sales outlet No. 15	48.2581	25.9310
Sales outlet No. 5	48.2670	25.9500	Sales outlet No. 16	48.2637	25.9520
Sales outlet No. 6	48.2651	25.9508	Sales outlet No. 17	48.2644	25.9462
Sales outlet No. 7	48.2576	25.9293	Sales outlet No. 18	48.2642	25.9517
Sales outlet No. 8	48.2579	25.9324	Sales outlet No. 19	48.2603	25.9538
Sales outlet No. 9	48.2584	25.9377	Sales outlet No. 20	48.2667	25.9506
Sales outlet No. 10	48.2679	25.9484	Sales outlet No. 21	48.2624	25.9451
Sales outlet No. 11	48.2639	25.9444			

Basing on the above reasoning, it was decided to apply GA for finding the optimal route. For its

realization the following basic structural elements were determined: the form of fitness function

(objective function) and population element, the crossover and mutation process. The form of fitness function corresponds to the objective function in the classical TSP (1.1). The route through all sales outlets was taken as a population element (one possible solution). Each route is a possible solution, though it is not necessarily the shortest one. The optimality of the route is determined by the assessment of fitness function for each population element. The population elements with great fitness function values are discarded (are lost), while those with smaller ones – continue to live. Thus, the average adaptability of the whole population improves. This is the way the selection process occurs. Further the crossover process follows as the stage of formation of new solutions in the population that has passed the selection process to restore its number. In the crossover process two available solutions are taken and their constituent parts (genes) are combined in a new solution that remains within the population. As crossing does not provide the whole amount of variants of genes combinations, the mutation process is necessary, which consists in the fact that for certain solutions there are random changes in the genes. This cycle is fulfilled until the required number of created populations is achieved or some other condition of algorithm stop is fulfilled. The solution found in such a way is not necessarily the best one, but it is close to optimal.

Having set the initial size of population equal 100 and geographical coordinates of sales outlets, we shall obtain the solution of this travelling salesman problem in the following form (Fig. 1).

The first graph of the Figure 1 presents sales outlets that should be visited by the k -th sales agent on the m -th working day of the cycle. The second graph of the Figure 1 presents the obtained closed route of the agent, the initial point of it is denoted by a circlet. The sequence of sales outlets visitation is as follows: 1 – 4 – 21 – 9 – 8 – 13 – 7 – 3 – 15 – 11 – 17 – 14 – 2 – 10 – 5 – 20 – 6 – 18 – 16 – 19 – 12 – 1. The total distance covered by the agent visiting the sales outlets per day will amount to 0.0828 of a degree that for this geographical latitude corresponds to 5.887 km. This solution was obtained after 1914 iteration of the algorithm.

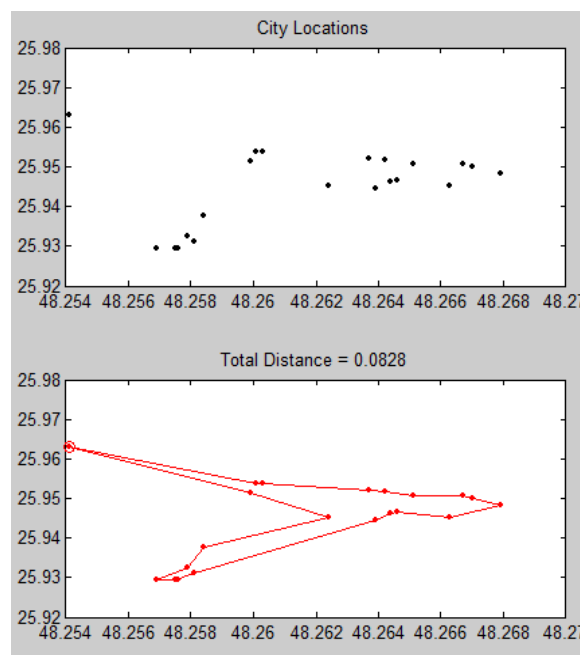


Fig. 1. Sales outlets that should be visited by the k -th sales agent and his modeled near optimal route without consideration of transportation network

The constructed model enables to obtain a near optimal route of passing all destination points within seconds and calculates the total length of the route. However, it does not consider the transportation roads, i.e. it tracks the route “straight”. That is why it was decided to build the next model with consideration of transportation network.

3.2 Searching for Shortest Route with Consideration of Transportation Network

Let us set up the matrix of distances between each pair of destination points calculated according to the existing roads by means of GIS Google Maps. The solution obtained in such a way after 898 iterations includes the following sequence of visiting the points: 1 – 12 – 4 – 19 – 16 – 18 – 6 – 20 – 5 – 10 – 2 – 17 – 14 – 21 – 11 – 9 – 8 – 15 – 7 – 3 – 13 – 1, while the total length of the route amounts to 8.947 km, that is by 52% greater than the result obtained without consideration of transportation roads.

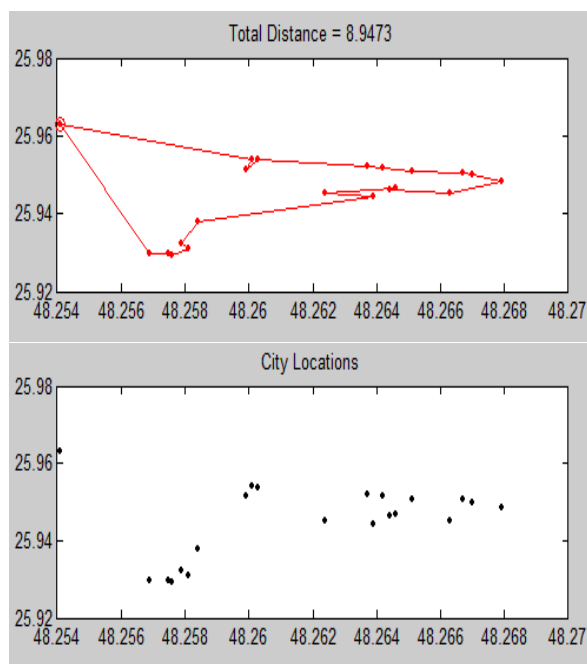


Fig. 2. Sales outlets that should be visited by the k -th sales agent and his modeled near optimal route with consideration of transportation network

However, this is an ideal variant. Practically the situations occur, when sales outlets representatives ask the sales agent to come later during the day because of too many customers or lack of time. Then the developed algorithm should be improved taking into account the repeated visit to a certain sales outlet. The main question of interest for us is: How will the total length of the route change then?

3.3 Searching for Shortest Route with Consideration of Transportation Network and Repeated Visitation of Certain Sales Outlets

Let us assume that the Sales Outlet No. 6 should be visited once again. Then it is suggested to divide the total set of sales outlets into two subsets: the set of already visited sales outlets (the sales outlets No. 1, 12, 4, 19, 16, 18, 6) and the set of those not yet visited (the sales outlets No. 6, 20, 5, 10, 2, 17, 14, 21, 11, 9, 8, 15, 7, 3, 1). It is obvious that sales outlets No. 1 and 6 belong to both subsets: No. 1 being the initial and final point of the route and No. 6 – due to repeated visitation. The route of the sales agent visitation of the first set of sales outlets is determined and does not change. To calculate the order of visiting the

sales outlets not yet attended by the agent, it is necessary to improve the existing algorithm setting the initial point (in our case it is Sales Outlet No. 20) and the final point (Sales Outlet No. 1) of the route excluding the route closeness. The further step consists in combining the two routes in one by adding the routes lengths and the distance between Sales Outlets No. 6 and No. 20.

Thus we have obtained the route of visiting all the sales outlets with repeated visit of Sales Outlet No. 6: 1 – 12 – 4 – 19 – 16 – 18 – 6 – 20 – 6 – 5 – 10 – 2 – 17 – 14 – 21 – 11 – 9 – 8 – 15 – 7 – 3 – 13 – 1. The route length in this case amounted to 9.458 km, which is 5.71% greater than the length of the near optimal route with single visitation of all points excluding the first one. Addition of another sales outlet to be visited repeatedly increases the total length of the route by 4.6%.

Moreover, the near optimal route can change because of roadblocks due to road maintenance or traffic jams that require taking the bypass. Taking into consideration all mentioned above we can set the additional 10% of distance to the length of the near optimal route.

3.4 Analyzing Results

The results of comparison of real routes covered by the k -th sales agent during every day of the cycle with the near optimal routes calculated using genetic algorithms are presented in Table 2 with consideration of 10% correction.

Analyzing the data presented in Table 2, one can see that if the days of the cycle are concerned, the deviation is sufficient. For instance, for the 3rd day of the cycle the k -th sales agent found such an optimal route that the length of the modeled route is only 2.8% smaller than its real length, and with consideration of 10% correction it is even greater. On the contrary, on the 6th day of the cycle there is the greatest deviation 59.4%, i.e. the existing route is by 2.5 times longer than the modeled one. The high amplitude of deviations can be conditioned by variation of the amount of points to be visited along the route, as the smallest deviation is recorded for the 5th and 10th days of the cycle, when the amount of points is not more than 9. The greatest deviation is typical for the “busiest” 6th and 7th days, when the amount of points reaches 22.

Table 2. Comparison of the lengths of real and modeled routes

Days of cycle	Length of real route, km	Length of near optimal route, km	Length of near optimal route, corrected by 10%, km	Error, %
Day 1	14.823	8.947	9.842	33.6
Day 2	10.100	8.573	9.430	6.6
Day 3	10.480	10.180	11.198	-6.8
Day 4	11.575	8.836	9.720	16.0
Day 5	7.754	6.813	7.494	3.3
Day 6	20.910	7.713	8.484	59.4
Day 7	19.543	8.676	9.544	51.2
Day 8	14.630	12.680	13.948	4.6
Day 9	15.798	9.024	9.926	37.2
Day 10	8.580	7.529	8.282	3.4

Taking into account everything mentioned above, it can be concluded that the suggested algorithm of solving the TSP for a commercial business enables to find the near optimal route of visiting sales outlets by the sales agent, and the found route is by 28.8% shorter than the real one.

Thus implementation of the suggested method of finding the near optimal route of visiting sales outlets by the agent in the products distribution process enables the trade businesses to reduce transportation expenses at the average by 28.8% for each agent per day. Knowing the number of sales agents of the company, it is easy to calculate the profit that optimization of routes of visiting the sales outlets by agents can provide for the company.

4 CONCLUSIONS

In this research the travelling salesman problem for wholesale trade businesses was formulated

and solved using genetic algorithms. Consideration of transportation network of the region fitted the solution of this problem to reality. Furthermore, the suggested algorithm, as opposed to other available ones, satisfies additional conditions of repeated visitation of certain sales outlets by the agent. The obtained close to optimal route of visiting the sales outlets by the agent is by 28.8% shorter than the real one. The results of this investigation enable to reduce transportation expenses of the company from its operational activity and, consequently, – to increase the profitability and competitiveness of the company.

Within the further research it is planned to solve the problem of searching the optimal route of products distribution by goods transport taking into account the load-carrying capacity of transportation means as well as other factors.

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LINGUISTIC ANALYSIS AND MODELLING SEMANTICS OF TEXTUAL CONTENT FOR DIGEST FORMATION

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Abstract

This article suggests a method of functional and logistical processing of content as a stage of a content life cycle. Commercial content processing method describes the formation and rubrication of electronic digests, and simplifies a commercial content management technology. The main problems of functional processing of commercial content services were analyzed in this paper. The proposed method provides an opportunity to create information resource processing tools as well as implement commercial content management subsystems. This paper presents the generative grammar application in linguistic modelling and analysis for the textual commercial content. In the given article is functional logistic method of commercial content processing as the content life cycle stage in electronic commerce systems proposed. Description of syntax sentence modelling is applied to automate the processes of analysis and synthesis of texts in natural language. The method of commercial content processing describes the information resources forming in electronic commerce systems and automation technology simplifies the commercial content management. In the given article the main problems of electronic content commerce and functional services of commercial content processing are analyzed. The proposed model gives an opportunity to create an instrument of information resources processing in electronic commerce systems and to implement the subsystem of commercial content formation, management and support.

Keywords:

digest, content, content analysis, content monitoring, content search, information resource, electronic content commerce systems, generative grammar, structured scheme sentences, computer linguistic system.

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1 INTRODUCTION

Research linguists in the sphere of morphology, morphonology, structural linguistics have identified different patterns for the word forms



description (Berko, Vysotska, & Pasichnyk, 2009), (Bolshakova, Lande, Noskov, Klyshynskyy, Peskova, & Yahunova, 2011), (Gladky, 1985), (Gladky, & Melchuk, 1969), (Gladky, 1973), (Chomsky, 1956, 1959, 1961, 1962, 1963), (Chomsky, & Miller, 1958), (Chomsky, & Miller, 1963), (Chomsky, & Schuetzenberger, 1963). With beginning of the development of generated grammars theory linguists have focused not only on the description of the finished word forms, but also the process of their synthesis. In Ukrainian linguists is fruitful research in functional areas such as theoretical problems of morphological description, the classification of morpheme and word creative structure of derivatives in Ukrainian language, regularities for affix combinatory, modeling word-formative mechanism of the modern Ukrainian language in dictionaries of integral type, the principles of internal organization in words, structural organization of different verbs and nouns suffix, word creative motivation problems in the formation of derivatives, the laws of implementing morphological phenomena in Ukrainian word formation, morphological modifications in the verb inflection, morphological processes in word formation and adjectives inflection of modern Ukrainian literary language, textual content analysis and processing, etc.

This dynamic approach of modern linguistics in the analysis morphological level of language with focused attention researcher on developing morphological rules allows to effectively use the results of theoretical research in practice for the computer linguistic systems construction of textual content processing for various purposes (Berko, Vysotska, & Pasichnyk, 2009), (Bolshakova, Lande, Noskov, Klyshynskyy, Peskova, & Yahunova, 2011), (Braychevskyy, & Lande, 2005), (Clifton, 2009), (Grigoriev, & Lande, 2005), (Lande, Furashev, Braychevskyy, & Hryhorev, 2006), (Lande, 2005-2006), (Lande, & Braychevskyy, 2005-2006), (Lande, & Litvin, 2001), (Lande, & Morozov, 2004-2005), (Lande, & Furashev, 2006), (Lande, Furashev, Braychevskyy, & Hryhorev, 2006), (Lande, Furashev, & Grigor'yev, 2006), (Furashev, Lande, Grigor'yev, & Furashev, 2005), (Furashev, Lande, & Braychevskiy, 2005), (Pasichnyk, Scherbyna, Vysotska, & Shestakevych, 2012). One of the first attempts to apply generated grammars theory for

linguistic modeling belongs to A. Gladky and I. Melchuk (Gladky, 1973, 1985), (Gladky, & Melchuk, 1969). Experience and research of A. Gladky and Noam Chomsky (Chomsky, 1956), (Chomsky, 1959, 1961, 1962, 1963), (Chomsky, & Miller, 1958, 1963), (Chomsky, & Schuetzenberger, 1963) are applicable to the tools developing for textual content processing as information retrieval systems, machine translation, textual content annotation, morphological, syntactic and semantic analysis of textual content, educational-didactic system of textual content processing, linguistic support of specialized linguistic software systems, etc.

2 RECENT RESEARCH AND PUBLICATIONS ANALYSIS

At the present stage of development the need of development of general and specialized linguistic systems make active use of applied linguistics and computer information technology. Development of mathematical models for computer speech language systems support allows to realize such tasks of applied linguistics as analysis, synthesis of oral or written text content, description and indexing of text content, texts translation, creation of lexicographical databases, etc. Linguistic analysis of the text content consists of several processes of grapheme, morphological, syntactic and semantic analysis (Gladky, 1973, 1985), (Gladky, & Melchuk, 1969). For each of these stages appropriate models and algorithms were developed (Chomsky, 1956), (Chomsky, 1959, 1961, 1962, 1963), (Chomsky, & Miller, 1958, 1963), (Chomsky, & Schuetzenberger, 1963). An effective tool for linguistic modeling at syntactic and semantic level of language is a main part of combinatorial linguistics - theory of generative grammars, the beginning of which lays in the work of American linguist Noam Chomsky. He used the method of formal analysis of the grammatical structure of phrase to allocate syntactic structure (components) as the structure of the phrase, regardless of its value. The ideas of Noam Chomsky developed the Soviet linguist A. Gladky (1973, 1985), (Gladky, & Melchuk, 1969), using the concept of dependency trees and components systems for modeling language syntax. He proposed a method of syntax modelling using syntax groups that produce phrases components

as units of dependency tree building – such representation combines the advantages of direct constituents method and dependency trees.

The advantages of using the simulation of generative grammars is the ability to describe not only the language syntax (rules of sentence formation forms words), but also morphemic (rules of words formation from morphs) and semantic (rules of meaningful sentences and texts formation) levels. It is used to automate the process of inflection/derivation, categorization or key words identification and forming text content digests. For example, when using automatic morphological synthesis computer system creates the necessary linguistic word forms based on requirements to word forms and morphemes databases.

Linguistic analysis of the content consists of three stages: *morphological*, *syntactic* and *semantic* (Bolshakova, Lande, Noskov, Klyshynskyy, Peskova, & Yahunova, 2011), (Gladky, 1973, 1985), (Gladky, & Melchuk, 1969). The purpose of morphological analysis is to obtaining basics (word forms without of inflections) with the values of grammatical categories (eg, part of speech, genus, number, case) for each word forms. There are the *exact* and *approximate* methods of morphological analysis (Bolshakova, Lande, Noskov, Klyshynskyy, Peskova, & Yahunova, 2011). In the exact methods use dictionaries with the basis of words or word forms. In the approximate methods use experimentally established links between fixed letter combinations of word forms and their grammatical meaning.

A dictionary using with word forms in the exact methods simplifies using the morphological analysis. For example, in the Ukrainian language solve the problem of the vowels and consonants letters alternation by changing the conditions of using the word (Bolshakova, Lande, Noskov, Klyshynskyy, Peskova, & Yahunova, 2011). Then for finding the words basics and grammar attributes use algorithms of search in the dictionary and selecting appropriate values. And then use morphological analysis provided the failure to locate the desired word forms in the dictionary. At sufficiently complete thematic dictionaries speed of textual content processing is

high, but using the volume of required memory in several times more than using a basics dictionary. Morphological analysis with the use of the basics dictionary is based on inflectional analysis and precise selection of the word bases. The main problem here is related to homonymy the words basis. For debugging check the compatibility of dedicated bases in words and its flexion.

As the basis of approximate methods in morphological analysis determines the grammatical class of words by the end letters and letter combinations (Bolshakova, Lande, Noskov, Klyshynskyy, Peskova, & Yahunova, 2011). At first allocate stemming from basis words. From ending word sequentially take away by one letter after another and obtained letter combinations are compared with a inflections list of appropriate grammatical class (Gladky, 1973, 1985), (Gladky, & Melchuk, 1969). Upon receipt of the coincidence of final part with words is defined as its basis. In conducting morphological analysis arise ambiguity of grammatical information determination, that disappear after parsing. The task of syntactic analysis is parsing sentences based on the data from the dictionary. At this stage allocate noun, verb, adjective, etc., between which indicate links in the form of dependency tree.

V – is finite not empty set, the alphabet; T – the subset of V , its elements are terminal (main) lexical units, terminals; S – the initial symbol ($S \in V$); P – is a finite set of productions (conversion rules) $\xi \rightarrow \eta$, where ξ and η – strings over V . The set $V \setminus T$ is denoted by N , its elements are non-terminal lexical units, non-terminals (Gladky, 1973, 1985), (Gladky, & Melchuk, 1969). Grammars are classified by the types of productions, which imposed certain restrictions.

1. Grammar G_0 is unlimited. Here ξ - random string that contains at least one non-terminal symbol, η - random string over V .
2. Context-sensitive grammar G_1 . In the set of productions P exists production $\gamma\xi\delta \rightarrow \gamma\eta\delta$, $|\xi| \leq |\eta|$ (but not in the form $\xi \rightarrow \eta$), then you can substitute ξ with η only surrounded by strings $\gamma... \delta$, i.e. in appropriate context.
3. Context-free grammar G_2 . A non-terminal A on the left side of $A \rightarrow \eta$ production can be

replaced by string in random environment whenever it occurs, i.e. regardless of the context.

4. Regular grammar G_3 . May occur productions $A \rightarrow aB$, $A \rightarrow a$, $S \rightarrow \lambda$, only, where, B – non-terminal, a – terminal, λ – empty string.

Terminal lexical units are word forms of natural language, nonterminal lexical units are syntactic categories, and terminal strings are correct expressions of the language (Chomsky, 1956, 1959, 1961, 1962, 1963), (Chomsky, & Miller, 1958, 1963), (Chomsky, & Schuetzenberger, 1963). Then production of the expression naturally interpreted as its syntactic structure, which is given in terms of generative grammar. The set of natural language expressions has a number of specific properties. Analyzing natural language expressions in the theory of formal grammars, they are considered as strings of word forms / morphemes as terminal lexical items. To set expression recognition algorithm exists, or submitted string is an expression of the language. Sets, for which recognition algorithms exists are recursive. But for the generation of natural language expressions, and only for them, for grammar impose restrictions on production: in production $A \rightarrow B$ string B is no shorter than string A ; then while production strings are not reduced.

Grammar G_0 does not meet the specified limit - there are productions that reduce strings (Gladky, 1973, 1985), (Gladky, & Melchuk, 1969). However, language $L(G_0)$ is recursive. Languages generated by not contractile grammar, are easily recognizable. In the context-sensitive grammar G_1 exists a production $\gamma A \delta \rightarrow \gamma \eta \delta$, wherein at least one of the strings γ , different from Λ , and nonterminal A is substituted by string η surrounded only by γ and δ , i.e. in context. Language is context-sensitive, if there is at least one context-sensitive grammar that generates the language.

The term rules formation is borrowed from mathematical logic, where it refers to the rules of correct formulas construction. In logics a different type of rules is considered - the rules of conversion. They set certain correlation between

valid formulas. Production rules are needed in the natural languages description. Setting transformation rules means a transition to a higher level language examination, namely the semantic level. Knowing language necessarily implies the ability to not only build the right phrase, but the switch from one sentence to another, or completely synonymous to it, or that differ from it by the sense of a certain amount, for example, to make an affirmative sentence negative or interrogative, to change active voice into passive, change the stylistic color of text, to express the same thought in different ways and so on. These features can not be stated in terms of grammars, and therefore raises the question of developing a formal system for transformation rules regarding natural languages. The corresponding problem was first stated in works of Noam Chomsky. His concept quickly gained the fame under the name of transformational grammar: an introduction of semantic level of language description. In fact, all invariant transformations usually makes sense, transformation – it is a change that preserves meaning. Thus, the transformation theory is a theory language synonymy. Description of synonymy in linguistics must take a central place. Hence the primary role of transformation appears. However, transformation does not belong to the same level as that of grammar: G_0 grammar is related to syntax and transformation - to semantic. That is insufficient to describe the grammar G_0 of language meaning is not true in the sense of grammar G_0 coverage semantic level. At the syntactic level grammar is fundamentally quite sufficient. Generative grammar is viewed within the formal theory. For transformations level of formalization is not achieved: transformation rules are not formulated in terms of a simple operation. The task of further formalization of transformations is very important. In the works of Noam Chomsky and several other authors (Gladky, 1985), (Gladky, & Melchuk, 1969), (Gladky, 1973), (Chomsky, 1956), (Chomsky, 1959), (Chomsky, 1961), (Chomsky, 1962), (Chomsky, 1963), (Chomsky, & Miller, 1958), (Chomsky, & Miller, 1963), (Chomsky, & Schuetzenberger, 1963) term generative grammar is used in two senses: in the broad - to refer to any system of formal rules describing the language, including transformation and morphonological components and narrow - to

describe exactly grammars. In this work the term is always in a narrow sense. With such discourse transformation rules are beyond the generative grammar.

3 STATEMENT OF PURPOSE

Submission of syntactic structure in terms of generative grammar is often used in linguistics and studied many times in many different ways. It has won the right to exist both in theoretical terms and in experimental works (automatic translation or abstracting, etc.). Grammars while generating terminal strings, such as expressions of natural language, also giving their structure. Unlimited not shortens grammar has no longer the property of expressions comparison with their context-sensitive structure. In this grammar each time more than one lexical unit is replaced, but a group of them. In the derivation, the parent of each lexical unit cannot be uniquely, and so production rule applying is not converted in a context-dependent structure.

Linguistic software is used in many information systems (Berko, Vysotska, & Pasichnyk, 2009). Improving machine-human communication is an important current task, which is solved through the

texts analysis and synthesis on the linguistic level. For this purpose, consider the process of linguistic phrases modelling in natural language by generative grammars.

For automated content retrieval and processing of textual content is of great importance to the presence/absence and frequency of occurrence of a particular category of linguistic units in the studied array of content. Quantitative calculation allows to draw objective conclusions about the direction of the content by the number of analysis units (key quotes) in the investigated arrays, for example, the number of positive/negative reviews on a certain type of product. Qualitative analysis allows to draw objective conclusions about the availability of desired linguistic units in the array of content and the direction of its context. Content search is performed not on the text content, but for its brief characteristics – the retrieval images (RIm), where the main text of content is served in terms of specialized information retrieval language. The procedure for the RIm provides indexing, semantic analysis of the main text content and translating it into information retrieval language (table. 1).

Table 1. *The main stages in content-search operation*

Operation name	Operation description
RIm Formation	Create, input, storage in RIm module
Query generation and SA	Create, input and storage in the queries module and SA of a user's query.
Content search	Comparison RIm of content with SA of user request
Content analysis	Quantitative and qualitative analysis of text content.
Result formation	The result of applying content analysis of positive content in range (0,7; 1] or (0,5; 1].
Decision making	The decision on issuing of the content according to the result of applying content analysis.
Content presentation	The issue of the content that corresponds to the information request of the user.

In the module are stored no texts content, but its RIm. To search the indexed content is used content analysis in information requests (Boiko, 2005), (Doyle, 2005), (Hackos, 2002), (Halverson, 2009), (McGovern, & Norton, 2001), (McKeever, 2003), (Nakano, 2002), (Rockley, & Cooper, 2002), (Stone, 2003), (Salton, 1979), (Papka, 1999), (Zipf 1935, 1949). Information request translated into information retrieval language and

supplemented to search for additional data, is a search available (SA). The degree of detail in the presentation of content in RIm of its central theme/subject and related topics/subjects is the depth of indexing. Automating this process allows you to ensure its unification, dismissing the part of staff from unproductive labour indexing content. Content search is provided by a set of semantic tools: information retrieval language, methods,

content indexing/query and search. Based semantic tools is information retrieval language - specialized artificial language designed to describe the central themes/subjects and formal characteristics of the content, as well as to describe queries and search. In practice, one language is used for indexing content and the other for indexing information requests.

Content formatting is the process of indexing, semantic analysis, the basic definition of the content and convert it into XML format. The formatting of the content is performed manually by a moderator or automatically by means of content

analysis. While indexing, examine the text content, determine its central theme and describe it in terms of information retrieval language. In the content section titles, as a rule, reveal a Central theme and subject, but the name is not always possible to identify the content. Natural language is not used as information retrieval through numerous grammatical inclusions, lack of structuring, ambiguity and greater redundancy, in particular, for the Ukrainian language 75-80 %. In information retrieval language among the major elements (table. 2) do not use synonyms and homonyms through their semantic ambiguity.

Table 2. *The main elements of an information retrieval language*

Element name	Language unit characteristics
Alphabet	Set of graphic characters to commit the words and expressions of the language.
Vocabulary	Set of interrelated linguistic units (words used in speech).
Grammar	Set of the rules of association of linguistic units in word, which is most effective means of building sentences.
Paradigm	Lexico-semantic group of words with subject-logical links based on semantic criteria.
Paradigmatic relations	Basic and analytical relation between words, with no dependence on the context in which they are used, generated with not linguistic, but logical relationships.
Syntagmatic relations	Linear relationships between words that are settled when combining words into phrases and phrases.
Identification rules index	Paradigms (vocabulary) and syntagmatics (grammar) of the language.
Statements unity	A statement is a sentence of natural language, but the reverse is not true.
Interphrase unit	United semantically and syntactically in the fragment. The core interphrase unity is a statement that is not subordinated to any other statement and saves sense when selecting from the context.
Blocks-fragments	Many interphrase unities that ensure the integrity of the text by semantic and thematic links.

The feasibility of using information retrieval languages depends on destination of search tools, technical tools, automation of information procedures and management. When designing information retrieval languages pay attention to the following points: the nature of the industry/theme for which you are developing language features of texts from the search array content; the nature of the information needs of users of electronic content commerce.

4 RESEARCH RESULTS ANALYSIS

The text content (article, comment, book, etc.) contains a lot of data in natural language, some of

which are abstract. The text is considered as a sequence of iconic pieces, unified by content, the basic properties of which are informational, structural and communicative coherence/ integrity that reflects the content / structural nature of the text. The method of text content processing is a linguistic analysis of content (eg, comments, forums, articles, etc.). The process of the text content elaboration divides content on tokens using finite automates of linguistic analysis of natural language texts (Fig. 1).

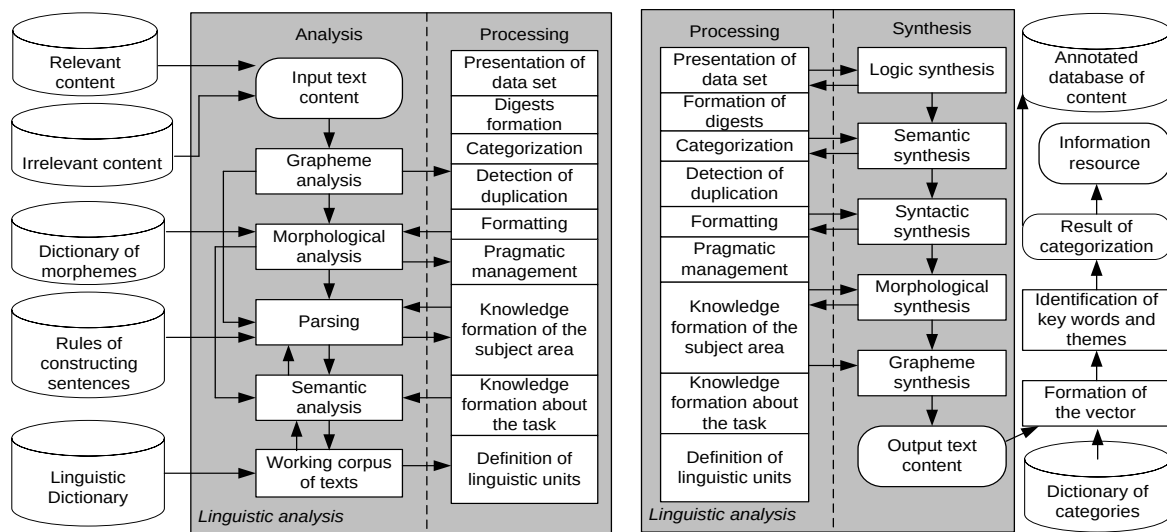


Fig. 1. Block diagram of the linguistic analysis of text content in the formation content

As functional, semantic and structural unity text content has rules of construction, detects patterns of meaningful and formal connections of constituent units. Connectivity of text content is shown by exterior structural indicators and formal dependence of the text components, and text content integrity - through thematic, conceptual and modal dependence of textual information. The integrity of text content leads to meaningful and communicative organization of the text, and text content connectivity - to form, structural organization of textual information. Let us consider not reductive grammar G with linguistic units and string length of the terminal linguistic units p of this grammar. Language $L(G)$ is easily recognizable set by algorithm (alg. 1), which builds any constructions in the grammar starting with initial symbol S . The number of productions occurrences in the derivation is its length.

Algorithm 1. Language $L(G)$ recognition

1st stage. Alternately apply S to grammar productions.

2st stage. Built string x verifying.

1st step. If yes, then go to 3st stage.

2st step. If not, then go to 1st stage.

3st stage. String x of S output.

In this algorithm, process of output can be infinite. To avoid this algorithm derived finite set is defined (alg. 2).

Algorithm 2. Recognition of $L(G)$ language using the set of derivations M

1st stage. Analysis of string x with lengths n , derived from the initial symbol S of grammar G .

1st step. Calculate the number of strings from S to x (no string is repeated). Since the grammar G is not contractile, whereas none of the strings in this sequence is no longer than the string (length $\leq n$). Number of different strings length $\leq n$ of p lexical units $\leq$

$$p^n + p^{n-1} + p^{n-2} + \dots + p^2 + p^1 + p^0 = \frac{p^{n+1} - 1}{p - 1} < p^{n+1}$$

when $p > 1$ (number of strings of length n of p lexical items equals to p^n , length of $(n-1)$ of p equals to p^{n-1} , and so on; number of strings of 0 symbols is equal to $p^0 = 1$). At $p^{n+1} = P$ of various strings such sequences is not more than

$$P! + C_p^1 \cdot (P-1)! + C_p^2 \cdot (P-2)! + \dots + C_p^{P-2} \cdot 2! + C_p^{P-1} \cdot 1!$$

Here the sum consists of p summands, its k -th summand equals to

$$C_p^k (P-k)! = \frac{P!}{k!(P-k)!} (P-k)! = \frac{P!}{k!} \leq P!,$$

where $C_p^k = \frac{P!}{k!(P-k)!}$.

The total sum is no more than $P! \cdot P < (P+1)! = (p^{n+1} + 1)! < (p^{n+2})!$.

2st step. Generate a sequence of strings from S to x . From the $(p^{n+2})!$ derived sequences set M is obtained.

2st stage. Construction of derivation set M of random string x .

3st stage. Check the resulting finite set of derivations M .

1st step. Find an appropriate derivation I set M or prove such derivation does not exist. If the derivation does not end in a string x , then go to 3st step.

2st step. If the derivation ends in a string x , then go to step 4.

3st step. If the end of the derivation set, then go to 5st stage, otherwise move to 3st stage.

4st stage. Formulating a positive answer: x is derived from S . Go to 5st stage.

5st stage. Formulating negative answer: x is not derived from S .

6st stage. Display the results.

Number of steps to form the set M to find an appropriate derivation does not exceed $(p^{n+2})!$ and is great for natural languages. This calls large capacity for such a resource-intensive algorithm. It is therefore necessary to choose a set where the number of steps in the recognition is in that depending on the length of the string, and identify rather narrow class class of recursive sets. And assuming that the set of expressions is infinite, their processing rules are more homogeneous, which can reveal significant patterns of derivation.

For more precise derivation of string x of S must still add an additional constraint: each production $X \rightarrow Y$ on the left side is Z_1CZ_2 (C - a lexical unit), and the right part (Y) - form Z_1WZ_2 (W - is a non-empty string). Then at every step of derivation is allowed to replace only one lexical unit. For any not contractility grammar an equivalent context-dependent grammar can be constructed, for example,

$$P_1 = \{AB \rightarrow BA\} \approx \\ \approx P_2 \{AB \rightarrow 1B, 1B \rightarrow 12, 12 \rightarrow B2, B2 \rightarrow BA\}$$

Consistent use of these rules is equivalent to the use of rule $AB \rightarrow BA$ and replace them last not

lead to the appearance of extra reduced, as lexical units 1 and 2 are new. In grammar G rules replace only one lexical unit (C). The left part of the production (X) does not necessarily consist only of a lexical unit. Around C may attend other lexical items (context), ie $X = Z_1CZ_2$. Then the production $Z_1CZ_2 \rightarrow Z_1WZ_2$ means a permit to replace C into W only in terms of context $Z_1...Z_2$ and without changing its location.

By introducing a new restriction (right side of any production containing not more than two lexical units) a new class of context-free grammars is formed, where the syntactic structure of expressions in constructing a tree with each structure is obtained not more than two branches. That expression always divided into two parts (eg, *nominal group* + *verb group*), each of these halves again divided in half and so on. But the binary representation of natural language expressions are not always satisfactory and natural in terms of meaningful linguistic interpretation. Criteria for selecting the appropriate descriptions are beyond theory: the choice is made on the basis of considerations relating to the specific objectives and the nature of the task. Since the number of lexical items in the right part of production is already minimal, impose restrictions on the nature of lexical units that replace (if the right side of each product consisted of one lexical unit or has the form bB , where b - terminal lexical unit, and B - syntactic category). This restriction specifies the string output, but requires a lot of power for computation.

The grammar has the following important property in the linguistic aspect. The terminal symbols as word forms from natural language are interpreted. The supporting characters as syntactic categories (eg, V verb, S noun, A adjective, $\tilde{V}$ verb group, $\tilde{S}$ group noun), the initial character as R (sentence) and displayed terminal strings as a correct sentence of the language are interpreted. Unlimited grammar of type 0 are a special case of the general concept in generative grammar. But, they are certainly adequate for describing any natural language in full. Every natural language (set of correct sentences) is easily authentication set. This means the existence of fairly simple recognition algorithm of phrases correctness.

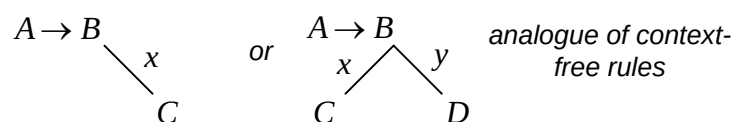
If natural language is recognized algorithm with with the specified restriction on the amount of memory, then it can be the generative grammar. Here, for displayed any terminal string of n length is a conclusion which none intermediate chain does not exceed the length of Kn (K is some constant). This grammar is *grammar with limited stretching* where capacitive signal function do not more than linear. For any grammar with limited stretching can build its equivalent grammar G_0 . It is able to describe the set of correct sentences for any natural language, ie generate any correct phrases of this language, while do not generating any false phrases. Both structures, presented as examples unsuitability of context-free grammars, G_0 grammar easily is described.

The method disadvantages of generative grammar in three points are described.

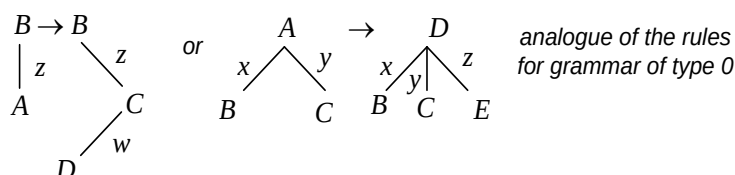
1. With their help, it is not possible naturally to describe phrases with discontinuous constituents.
2. The grammar G_0 contains only rules of linguistic expressions formation, such as word forms or phrases. The grammar specifies the correct expressions in contrast to incorrect.
3. Grammar G_0 are building sentences just with exactly certain word order (with the

fact that this sentence should have in final form). In this case generated sentence is matched syntactic structure in the form of an ordered tree, ie a tree where between nodes (except subordination relation, defined by a tree) there is also a relation of linear order (to the right - to the left). Thus, in the syntactic structure of G_0 grammar are not separated two absolutely different by nature, though interconnected relationships: syntactic subordination and linear relative position. But possible describe the syntactic structure showing relation of syntactic subordination. As for the relation of linear order, it describes not the structure, but a phrase.

The words order depends on syntactic structure. It necessarily from its accounting is determined and thus is in relation to its somewhat derivative, secondary. It is expedient to modify the concept of generative grammar so that the left and right parts of substitution rules were not linearly ordered strings, eg as trees (no linear ordering), depicting the syntactic relation (Gladky, 1973, 1985), (Gladky, & Melchuk, 1969). Then the rules are as follows:



or



Lines with symbols represent the syntactic relations of different types. Letters $A, B, C, \dots$ represent syntactic category NB: relative positions of symbols for one level of subordination does not play any role and in this scheme is randomly; $B \xleftarrow{x} A \xrightarrow{y} C$ means the same thing as $C \xleftarrow{y} A \xrightarrow{x} B$ (Gladky, 1973, 1985), (Gladky, & Melchuk, 1969), (Chomsky, 1956,

1959, 1961, 1962, 1963), (Chomsky, & Miller, 1958, 1963), (Chomsky, & Schuetzenberger, 1963). As a result the syntactic structures (not phrases) calculation in language is obtained. This calculation is part of the generative grammar. The rest of this grammar is the calculation that sets all possible its linear sequences of words for any given syntactic structure (including any other factors, eg with the mandatory accounting logical

selection in the Ukrainian language, etc.). Then is removed the problem of discontinuous constituents (Gladky, 1985), (Gladky, & Melchuk, 1969), (Gladky, 1973). From the output sentence in a regular grammar can not get the natural presentation of immediate constituents structure with this sentence. That is, regular grammars provide some structure constituents like all grammars immediate constituents, however, these components are usually formal. In the analysis explore multilevel structure for textual content: a linear sequence of symbols; linear sequence of morphological structures; linear sequence of sentences; network of interconnected unities (Alg. 3).

Algorithm 3. The linguistic analysis of the textual content

1st stage. The grammatical analysis of textual content.

1st step. Separation of commercial textual content on sentences and paragraphs.

2st step. String separation of symbols into words.

3st step. Bold of digits numbers, dates, constant phrases and abbreviations.

4st step. Removing the non-text symbols.

5st step. Formation and analysis of a linear sequence of words with the special characters.

2st stage. Morphological analysis of the textual content.

1st step. Getting the basics (word forms from cut off their end).

2st step. Each word form is assigned a value of grammatical categories (the set of grammatical meanings: gender, case, declension, etc.).

3st step. Linear sequence formation of morphological structures.

3st stage. Parsing textual content.

4st stage. Semantic analysis of textual content.

1st step. Words are correlated with semantic classes from dictionary.

2st step. Selection of needed morphologically semantic alternatives for the sentence.

3st step. Linking words into a single structure.

4st step. An ordered set formation of superposition records from basis lexical functions and semantic classes. The result accuracy is determined by dictionary completeness/correctness.

5st stage. Referential analysis to form between phrasal unities.

1st step. Contextual analysis of content. According to his help is realized local reference resolution (this, that, it) and expression selection as the unity core.

2st step. Thematic analysis. Expression separation on the topic identifies thematic structure using, for example, content categorization and the digest formation.

3st step. Definition of regular frequency, synonyms and re-nomination of keywords; reference identification, ie the words ratio with the image object; implication availability, based on situational relations.

6st stage. Structural analysis of text. Prerequisites for using a high degree of unity terms coincidence, discursive unit, sentence of semantic language, expression and elementary discourse unit.

1st step. Basic set identification for rhetorical relations between unities content.

2st step. Nonlinear network construction for unities. A links set openness implies its enlargement and adaptation for the textual structure analysis.

Text construction is determined theme expressed information, terms of communication, task of messages and presentation style. With grammatical, semantic and compositional structure of content is related his stylistic characteristics that depend on individuality author and subordinated thematic/stylistic dominants of text. The main stages of the morphological characters determining for textual units: grammatical classes definition for words (speech parts) and principles of their classification

allocation; part separation of the words semantics as morphology unit, set justification for morphological categories and their nature; the set description for formal tools that are attached to parts of speech and their morphological categories. This are used following methods for grammatical meaning expression: synthetic, analytical, analytical and synthetic.

Grammatical values are summarized through the same type of characteristics and are subject on partial values separation. For classes designation of similar grammatical meanings is used grammatical categories concepts. By the morphological values include the category of gender, number, case, person, time, method, class, type, united in paradigm for the text classification. The object of morphological analysis is the structure of words, inflection forms, ways for grammatical meanings expression. Morphological features for textual units are the research tools of communication between lexicon, grammar, using them in speech, paradigms (case forms words) and the syntagmatic (linear relationships of words, expression). The implementation of automatic coding of words in text (ie assigning them codes of grammatical classes) is associated with grammatical classification.

Morphological analysis includes the following steps: bases localization in word form; searching base in the dictionary of bases; the word forms structure comparison with data in dictionaries of the bases, roots, prefixes, suffixes, inflections. In an analysis identify the meaning of words and syntagmatic relations between content words. Analysis tools are a dictionary-based/inflections/homonyms and statistical/syntactic combinations of words removing lexical homonymy, semantic analysis for nouns with non-prepositional constructions, tables for semantic syntactic combination of nouns/adjectives and component of prepositional structures, analysis algorithms for determination of the checks sequence and the appeals in the dictionary and the tables, words division system in text on inflection and base, thesaurus equivalences for replacing equivalent words one/several new numbers of concepts that serve as identifiers for content instead of words based, thesaurus as a hierarchy of concepts for

searching total/associated concepts for this concept, dictionaries service system.

5 METHOD OF ELECTRONIC DIGEST FORMATION

Information support is always needed when solving complex problems in any living environment (Berko, Vysotska, & Pasichnyk, 2009), (Bolshakova, Lande, Noskov, Klyshynskyy, Peskova, & Yahunova, 2011), (Braychevskyy, & Lande, 2005), (Grigoriev, & Lande, 2005), (Lande, Furashev, Braychevskyy, & Hryhorev, 2006), (Lande, 2005-2006), (Lande, & Braychevskyy, 2005-2006), (Lande, & Litvin, 2001), (Lande, & Morozov, 2004-2005), (Lande, & Furashev, 2006), (Lande, Furashev, Braychevskyy, & Hryhorev, 2006), (Lande, Furashev, & Grigor'yev, 2006), (Furashev, Lande, Grigor'yev, & Furashev, 2005), (Furashev, Lande, & Braychevskiy, 2005), (Pasichnyk, Scherbyna, Vysotska, & Shestakevych, 2012). Meeting the information requirements is a mandatory requirement for innovation realization. At the same time, complexity of obtaining information affects efficiency and quality of solutions. The Internet can be considered as a large-scale mass media. Chaotic nature and existence, absence of clear periodicity maintaining and most sites updating as well as existing problems concerning effective information search do not allow using the Internet as a single solid mass media yet. Only certain network elements (which are often called network or the Internet media) are considered to be full-fledged mass media. Network mass media considered to be news portals with a certain updating frequency, electronic versions of printed periodical publications as well as newspapers and magazines existing in online electronic format. A constant growth of information production rates is one of the main features. Apart from increasing the amounts of information to the scales that render impossible its direct processing, there were a number of specific problems associated with information technology rapid development. Therefore, there is a quite powerful array of information (the Internet resources) for decision making in various public living environments, society and the individual on the one hand as well as a lack of information which is necessary for decision-making because of its dynamics,

volumes, sources, and unstructured nature. Coverage and generalization of large dynamic information flows, which are continuously generated in the media, demands qualitatively new approaches.

The situation related to the sharp growth of information production rate has resulted in a number of problems:

- a disproportionate growth of information noise due to poor information structuring;
- an emergence of parasitic information (received as applications);
- an inconsistency between formally relevant information (which is thematically corresponding) and consumers' real needs;
- a multiple duplication of information (a typical example of which is publication of a certain message in various editions).

It is an undisputed fact that an exponential growth of information production rates significantly reduces the efficiency of information processing by traditional methods. The important data are duplicated on multiple websites, the number of which is increased by an exponential law. The text automated processing programs performing indexing, annotation, abstracting, fragmentation as well as other forms of information analysis and synthesis has been created since the beginning of computer era. At the same time, a niche of automated abstracting systems can not be considered completed. The majority of present annotate making processes are not effective; there is still a real need for scalable methodologies and programs. Nowadays there are many ways to solve the problem, which are clearly divided into two directions – quasi-abstracting and brief summary of source document content. Quasi-abstracting is based on extraction of document fragments, i.e. identifying of the most informative phrases and quasi-abstracts formation. Source material brief summary is based on selection of texts by using artificial intelligence methods, special information languages of the most essential information as well as new texts generation and source documents which are summarized by content. Using such an approach provides a possibility to get more sophisticated annotations which may contain information that supplements source text. Due to the reliance on

formal representation of the source document semantics, such systems can be theoretically set to a very high compression ratio needed, for example, to send messages to mobile devices. Therefore it is possible to say that the main difference between the abstracting tools lies in the fact they form a set of extracts or a document brief summary. All existing industrial systems of Text mining class include automated abstracting tools, which are essential components of such systems. One of the basic procedures of this class – automated digest formation – is presented like automated abstracting which is based on a large number of documents. The documents, in which all input stream trends are reflected in the most clearly way, are selected to the digest. One can state that such digests should fully correspond information needs of the user whose request generates this incoming information flow.

Based on the abstract, which contains by its volume a small part of the source text, there is a possibility for users to make a reasonable opinion concerning source document spending significantly less efforts compared to complete reading. As a general rule, the volume of abstract used in automated abstracting should constitute from 5 % to 30 % of the source text. Preparing documents which represent the annotations from several sources (i.e. digests) offers even greater compression ratio.

The process of quasi-abstracting is reduced to extraction (removal) of the minimum relevant fragments from documents. At the same time, compared with a brief summary, it has some special feature which is based on synthetic surfactant relations analysis of lexical items presented in text. Quasi-abstracting focuses on specific fragments accentuation by phrase patterns comparing resulting in formation of blocks with the largest lexical and statistical relevancy. Frequency auto detection of certain words and combinations usage in the source document allows determining paragraphs and proposals, in which document theme is represented in the most accurate way. Final document formation is performed by selected fragments interaction. Thus the formed quasi-abstract gives the impression of a coherent text that significantly facilitates its perception. Nevertheless, in some cases, the quality of abstracting largely depends on genre of

the text, which is being worked out. Quasi-abstract content-richness also depends on other features of the source text. It is practically impossible to create qualitative abstract from fragments of the source document for large texts, monographs or interviews without taking into account the semantic regularities. The basis of the quasi-abstracting analytical phase is a calculation of weighting coefficients for each text block in accordance with such characteristics as unit location in source, frequency of appearance in the text, frequency of key phrases usage along with some other indicators.

The process of indexing depends on the descriptor dictionary or information retrieval thesaurus. Descriptive dictionary is structured table with three columns: basis of words; descriptors sets assigned to each basis; grammatical features for descriptors. Indexing consists of an informative word combinations selection from the text; deciphering abbreviations; replacing words with base-descriptors on descriptor code; removal of homonymy. In digest formation using content analysis with regard to frequency weights of words from the concepts dictionary generated. The digest formation consists of algorithms of the concepts dictionary forming (alg. 4), of the content duplicate definition (alg. 5) and of digest create (alg. 6).

Algorithm 4. Concepts thematic dictionary formation

1st stage. Concepts frequency vocabulary formation.

1st step. Sequential selection of all words in input content.

2st step. Alphabetical-frequency vocabulary construction based on content categories.

3st step. Words normalization through automatic morphological analysis.

4st step. Alphabetical-frequency vocabulary modification.

5st step. Words assign of weight w (use frequency).

6st step. Insignificant words deleting from the alphabetical-frequency vocabulary

($W \leq k$, where k is threshold value of word extracting).

2st stage. The thematic dictionary choice as requested.

3st stage. Words weight adjustment of alphabetical-frequency vocabulary dictionary based on thematic dictionary.

4st stage. Words choosing $N = n$ with more w of frequency vocabulary (moderator determines $n = const$).

Algorithm 5. Duplicate content determination

1st stage. The initial data formation.

1st step. Moderator introduced of words in string $m = const$.

2st step. Moderator input strings unique coefficient $U = const$.

3st step. Coefficient limits formation of the keywords use ie $K = [a_1, a_2]$, where $a_1 = const$ and $a_2 = const$.

4st step. Content partitioning on n chains of m words.

5st step. Frequency calculation of k_i keywords use.

2st stage. Content duplicates determination.

1st step. Words strings comparison for all content.

2st step. Chains uniqueness coefficients calculation u_i .

3st step. Chains uniqueness coefficients comparison u_i with U . At $n^{-1} \sum u_i < U$ mark the content as unsuitable.

4st step. The frequency comparison k_i with coefficient K . If $k_i < a_1$ or $k_i > a_{21}$ then a content mark as unsuitable.

Algorithm 6. A digest create

1st stage. Content Select based on its weight.

1st step. Digest size C input.

2st step. The algorithm 1 implementation.

3st step. The weight consistent determine of each content as the weights sum of its individual words that $W = \sum w_i$.

4st step. The input content stream sort from the weights values.

5st step. Meaningful content duplicates definition for statistical criterion of text uniqueness $U \geq 0,9$ (alg. 5).

6st step. Content filter of unsuitable for digests building (when $W \leq l$, where l is content removal threshold value by the self-education rules of content structuring and moderating) and statistically substantial duplicates.

7st step. The choice of $V = q$ content with greater weight where $q = const$ and the moderator given.

2st stage. Digest text construction of selected content.

1st step. Dictionary construction of selected content (alg. 6).

2st step. Content analysis application to the text.

3st step. Sentences filtration that do not meet the semantic rules of content structuring and moderating.

4st step. Hypertext presentation formation of digest, its contents and a link to the original source.

3st stage. Generated text edit of digest.

1st step. The check amount of generated content c_i . If $c_i < C$, then 2st step, otherwise 4st stage.

2st step. Content delete from input stream for digest formation.

3st step. 1st -2st steps implementation.

4st step. Resulting append to pre-formed digest and goto 1st step.

4st stage. Digest text formation as a separate content and its maintaining in the database with reference on the source.

A digest is the annotated text based on the analysis of several documents. While compiling digests automated abstracting methods of the one document apply to an array with a large number of documents. The majority of document automated abstracting algorithms consist of three basic stages: source text analysis, significant fragments definition (suggestions or whole paragraphs) and conclusion formation. At the same time, a digest may also be considered as a source of annotated hyperlinks to the underlying documents. While forming out digests the usage of quasi-abstracting methods makes coherent text obtaining almost impossible. Combining abstracts of each document will contain an excessive amount of incoherent information. However, while forming out the auto abstract which consists of a certain number of source document announcements, and which is divided into subsections, the usage of above mentioned method is quite acceptable (Berko, Vysotska, & Pasichnyk, 2009), (Pasichnyk, Scherbyna, Vysotska, & Shestakevych, 2012). Content monitoring is information flow semantic analysis which is carried out in order to get required qualitative and quantitative sections. In contradistinction to content analysis, it is performed continuously in time. Continuous analytical processing of messages is the most characteristic peculiarity of this approach, which enables to extract facts from texts as well as detect new terms and generate various statistical reports. Nowadays the named tasks are covered by two major technologies – factographic information extraction from texts (Information Extraction) and profound analysis of texts (Text Mining) (Berko, Vysotska, & Pasichnyk, 2009). Content monitoring method is an adaptation of content analysis classical methods to the dynamic information files conditions, i.e. information flows from the Internet. In contradistinction to information, integration systems, which implement the idea of collecting and gathering all accessible information from both internal and external sources, can detect non-obvious regularities in documentary data arrays or texts – so called latent (hidden) knowledge. Systems of this class allow carrying out the analysis of large volumes of documents as well as creating index of notions and topics highlighted in these documents. A typical problem of content monitoring is charting of concept emergence

dynamics over time (Berko, Vysotska, & Pasichnyk, 2009), (Pasichnyk, Scherbyna, Vysotska, & Shestakevych, 2012). The automated content monitoring technology has several important peculiarities:

- usage of publication key fragment as a forming unit of text information array;
- forming of publication key fragments is the union of two interrelated automated processes: analytical and synthetic processing as well as multilevel content analysis procedure of publication texts;
- indexation of key fragments publications is performed via multi-faceted classification.

The uniqueness of the proposed technology lies in uniting of content analysis semantic and quantitative methods. The sequence of stages of semantic problem analysis, which is investigated by specific information system, can be conditionally divided into semantic (qualitative) analysis of the publication totality and formal (quantitative) analysis of information arrays: index, bibliography and text array of publication key fragments (Berko, Vysotska, & Pasichnyk, 2009), (Pasichnyk, Scherbyna, Vysotska, & Shestakevych, 2012). There is a sufficient number of analytical systems presented in the software market focused on mathematical and statistical analysis of different quantitative and digital parameters. However a huge amount of text information contained in print media, information agencies news lines as well as the Internet content sites does not have any qualitative tool designated for analysis. This is precisely why working in this area acquires actuality.

The system's final goal is material brief summary automatic production (so called electronic publication digest in the media), i.e. an extract of the most important information out of one or more documents and laconic information-rich reports generation based on them. The system should carry out information monitoring by getting large amounts of data as well as analyze, systematize them using automatic categories, accumulate information by indexing material and placing it into a database, solve the problem of content filtration and generate digests automatically. Selection of final unified compromise solution taking into account various criteria is sufficiently complex task during planning and decision-making process. So, it makes sense to present significant information

selection problem in a hierarchical form using hierarchy analysis method. Information is selected by the algorithm which works out incoming text as well as identifies the most important information parts and fragments. Consequently, at the top level of hierarchy is located the goal – significant information selection. The goal specifying criteria are located on the second level: text basis, glossary completeness, key terms amount. Selection alternatives – incoming texts fragments – are located on the third level. (Fig. 2.)

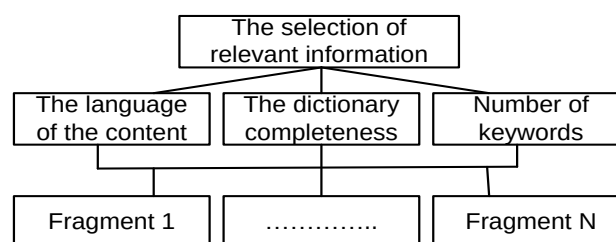


Fig. 2. Task layering

Use-case diagram represents various scenarios of interaction between actors (users) and precedents (use cases) as well as describes system functional aspects. The use-case diagram of automated formation and digest categorization system for electronic media is presented on Fig. 3. The article prepared by journalist is processed by a system in consequence of which terms statistical values are defined. Thematic classification makes it possible to include an article to a certain column. After that a digest is formed by Text Mining algorithms. In order to visualize system statistical aspects class diagram is plotted. System describing class diagram is presented on Fig.4. The class “content” is presented as a part of the class “analysis”, which is a part of the class “rubricator”. The class “glossary” is presented as a part of the class “rubricator” and “analysis”. The state diagram of automated formation and digest categorization system for electronic media is presented on Fig. 5. The finite state automation with simple states and transitions is presented on it. Activity diagram is a diagram showing some activity decomposition into its components (Fig. 5). Activity means treatment specification, which is performed, in coordinated sequential and parallel execution of subordinated elements – embedded types of activity as well as separate actions interconnected by streams that come from one node output to other. Algorithm schemes are activity diagram analogue.

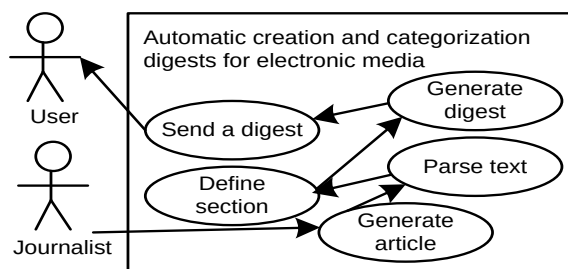


Fig. 3. System use-case diagram.

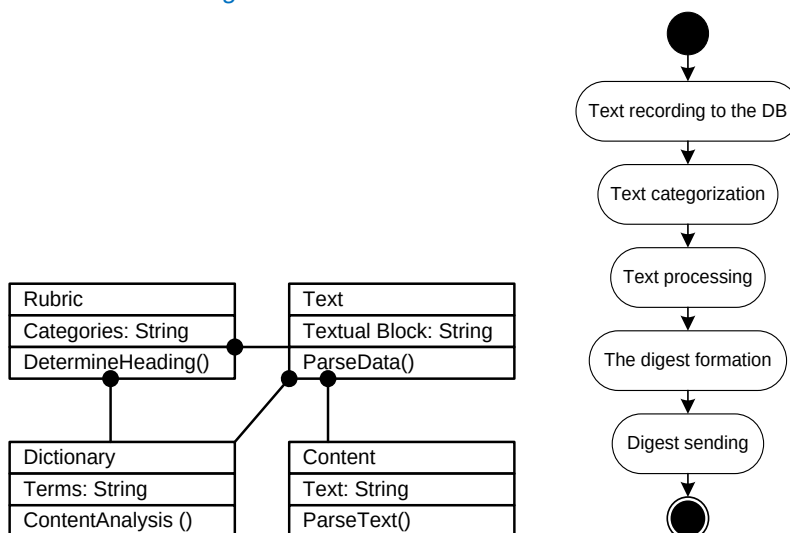


Fig. 4. Class diagram. State diagram

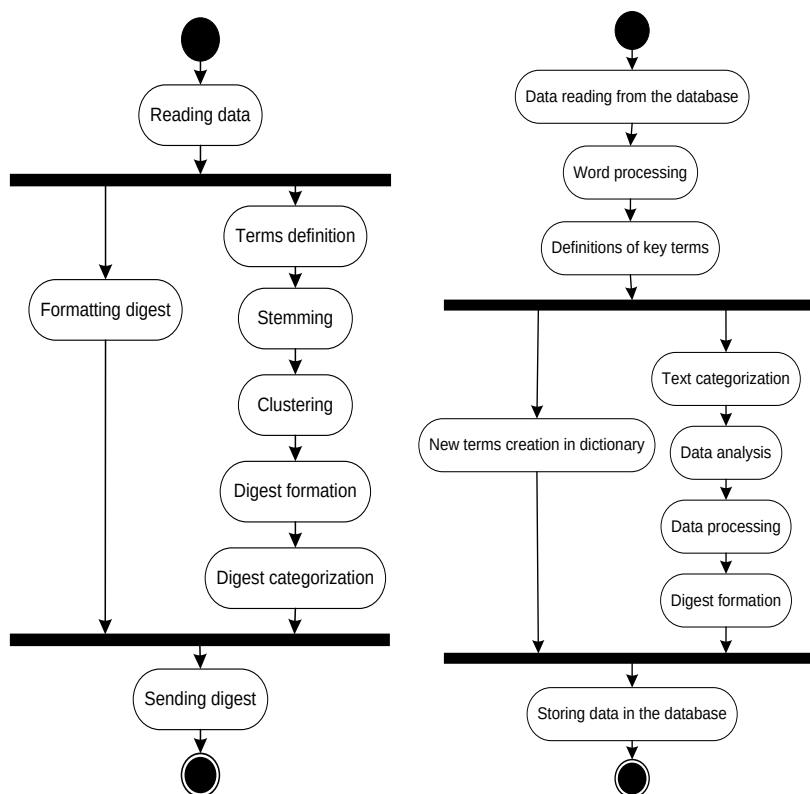


Fig. 5. Activity diagram of system operation algorithm

Message exchange (i.e. method call) between several objects in a specific time-delimited situation is presented on sequence diagram. Objects are instances of classes. The main emphasis in sequence diagrams is made on order and moments of time during which messages are sent to objects. In sequence diagrams the objects are represented using vertical dashed lines with

the name of the object over them. The time axis has also vertical direction – it is facing down. Messages sent from one object to another will be marked by arrows with operation and parameters name (Fig. 6). Collaboration diagram (Fig. 7) is intended for the specification of interaction system structural aspects. Cooperation is convenient for design pattern modeling.

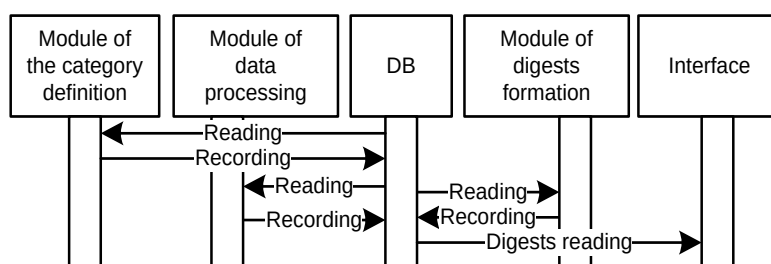


Fig. 6. Sequence diagram

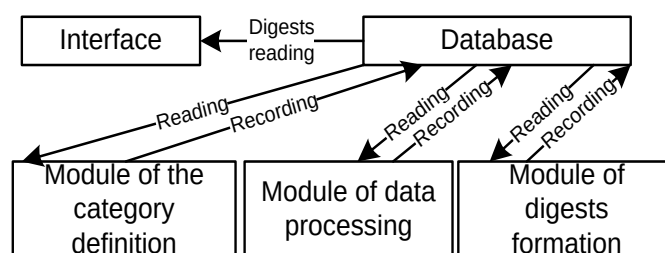


Fig. 7. Collaboration diagram

Web-monitoring module should allow circumventing user-specified pages and assigning download of web-pages updates. The data received should be read out by special modules which are oriented to receive information of such a type. All materials should be processed by categorization module after receiving and pre-processing. Initially construction and training of rubricator by expert is needed. The essence of education lies in teaching materials expert analysis including them to one or another rubric. Expert should specify relationship degree of text to one or another topic. Based on expert assessments categorization module should produce morphological and semantic analysis of text, specifying main thematic concepts as well as analyzing the structure of their location in the text. Data systematization in automatic mode is conducted on the basis of learning outcomes. Incoming text refers to one or more categories with affixing relationship degree. Material should pass indexation according to all words it contains after

distribution by category process. This procedure provides flexible search capabilities both on the basis of materials as well as their content. System operation results are presented in the form of thematic digests which are automatically created. The simplest strategy of quasi-abstracts formation lays in profile change fixing moments, i.e. transitions from lower levels to higher and vice versa. It means that we react on beginning and the end of each cluster selecting the first and the last sentence for quasi-abstract. This strategy is typical for positional referencing methods (Berko, Vysotska, & Pasichnyk, 2009), (Pasichnyk, Scherbyna, Vysotska, & Shestakevych, 2012), which essentially boils down to keeping the initial and the final fragments in the text structure specified by author. Thus it is considered that the most important parts of scientific article text are introduction and conclusion, in every unit – initial and final paragraph, in every paragraph – the initial and final sentence. The remarkable thing is that not all research papers (let alone texts of other

genres) are divided into sections and subsections, which is an additional argument in favor of developmental approach. The second strategy of quasi-abstracts formation is to determine weight of each sentence of text. The sentence weight is determined by the number of word form occurrences demonstrating clustering in random places in text. So, a sentence may not be a part of corresponding cluster. A version when sentence weight fixes diversity of clustered word forms presented in it (not their full amount) is more attractive (Berko, Vysotska, & Pasichnyk, 2009), (Pasichnyk, Scherbyna, Vysotska, & Shestakevych, 2012). Advantages of quasi-abstracting method lie in simplicity of implementation. However text block selection ignores relationships between them, and often leads to meaningless abstracts formation. Some sentences may appear missed or there may occur words or phrases that can not be understood without previous text, which is missed in the abstract. The attempts to solve this problem are mainly confined to exclusion such sentences from abstracts. The attempts to resolve references using linguistic analysis methods are made less frequently. The special approaches by which we can determine the presence of semantic gap are created in a number of human-machine interfaces. It is obvious that such an approach is not suitable for mass random word processing. As with the quasi-abstracting of separate text document, during the first phase of digest formation it takes place that the most important lexical items selection included in source documents array (incoming information flow) based on which system glossary is built up. Selection of the source documents from digest construction input array is carried out by taking into account their weights. The weight of each document is determined by taking into account separate words sum of weights normalized by the length of document included in this document. The phase of document selection intended to digest consists of following steps like definition of each document weight, sorting out incoming stream of documents by weight, definition of semantic duplicates of documents by statistical criteria, rejection documents unsuitable for digests formation (unacceptable types of documents, such as reviews), and semantic duplicates (which are detected by frequency alg. 7).

Algorithm 7. A digest formation

- 1st stage.** Formation of digest which reflects main trend.
- 2nd stage.** Removing documents that match trends as defined in previous step from incoming information flow.
- 3rd stage.** Digest formation that reflects the main trend of the rest of the basic information flow.
- 4th stage.** Obtained digests combining.
- 5th stage.** Transition to the 2nd stage is carried out if necessary (based on resulting digest required volumes).

Let us consider the algorithm of electronic digests automatic formation and rubrication. The system receives data from the database as an array of articles. After that it verifies whether user-defined request is specified for text article processing. In case there is an article needed further processing, text articles lemmatisation is carried out sequentially in order to determine lexemes, stemming for rejection stop words and clusterization. As a result of such elaborations, will be collected the information about position and weight of word forms enabling to include the article to specified rubric and form digest.

6 CONCLUSIONS

Research of the mathematical methods application for textual information the analysis and synthesis in natural language for the development of mathematical algorithms and software for textual content processing is required.

Theory of generative grammar (proposed by Noam Chomsky) is modeling processes at the syntactic level of language. The structural elements in sentences describe syntactic constructions in textual content regardless of their content. The article shows the features of the sentences synthesis indifferent languages of using generative grammars. The paper considers norms and rules influence in the language on the grammars constructing course. The use of generative grammars has great potential in the development and creation of automated systems for textual content processing, for linguistic providing linguistic computer systems, etc.

In natural languages there are situations where the phenomenon that depend on context and described as independent of context (ie, in terms of context-free grammars). In this case description is complicated due to the formation of new categories and rules. The article describes features in the process of introducing new restrictions on data classes through the new grammar rules introduction. If the symbols number on the right side in the rules are not lower than the left then got not reduced grammar. Then at replacement only one symbol got a context-sensitive grammar. In the presence only one symbol in the left side of the rule got a context-free grammar. None these natural constraints on the left side rules apply is not possible. The theory application of generative grammars for solving problems of applied and computational linguistics at the morphology and syntax level allows to create a system of speech and texts synthesis, to create practical morphology textbooks and inflection tables, to conclude the morphemes lists (affixes, roots), to determine the performance and frequency for morphemes and the frequency of different grammatical categories realization in texts (genus, case, number, etc.) for specific languages. Developed models on the basis of generative grammars for linguistic functioning computer systems designed for analytical and synthetic processing of textual content in information retrieval systems, etc. are used. Is useful to introduce all new and new restrictions on this grammar, getting more narrow their classes.

In describing the complex range of phenomena limit used means set of description, and the considering these features, which are served in general obviously insufficient. Research begin with minimum means. Whenever their are not enough (smaller portions) new means gradually are introduced. Thus possible to determine exactly what means can or can not use in the description of a phenomenon for understanding its nature.

While working in informational and analytical services and enterprises you have to deal with great diversity of information sources. These are electronic newspapers and other Internet resources. This article considers Ukrainian electronic mass media as well as their disadvantages, benefits, and services. The carried out researches of electronic mass media allow concluding of inexpediency use of human labor in the processes related to formation and ranking digests. A key part of this paper is also developing methods of formation and rubrication of electronic digests. The experience of implementing systems in different organizations has showed effectiveness and simplicity of adapting the system due to the developed instrument of automated digest formation and their rubrication. The universal data acquisition module allows you to automate completely the electronic information introduction from sources with bringing information to a common internal format, i.e. to minimize the routine work while entering text data.

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CONSUMER PROTECTION AND PRICE CONTROLS IN UKRAINE

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Abstract

This article has shown evolutionary transforming the institutional basis of the state regulatory impact on the consumer market. Outlines the basics of institutional support state control over pricing and quality of consumer goods. The analysis of legislative and regulatory acts, including the Constitution and laws of Ukraine "On Protection of Consumer Rights" and "On prices and pricing" that serve as the basis for complex transmission mechanism of state influence on the consumer market.

Institutional support of price controls for two decades have passed no easy way of helpless efforts to curb the wave of massive rise in price of production during the liberalization of prices to stabilizing the price dynamics of multifactor means of influence. The task of the state is not the freezing level of prices, and operative and objective tracking prices in order to establish civilized norms of pricing, creating limitations for abuse of monopoly position, followed by appropriate macroeconomic impact of the Government and the National Bank on consumer prices.

One of the main components of the institutional basis of the state which effectively protects the rights of its citizens is the right to independent consumer organizations to participate in the protection of consumers. Democracy begins "from below" - through the participation of every citizen in resolving issues related to their living conditions, the most effective means of engaging citizens is public awareness, public consultation, public control, audit, monitoring. Existing consumer legislation and the law "On Local Self-Government in Ukraine", give every opportunity to include in the charter of the territorial community participation of citizens as consumers in resolving common to all residents of the community the most important priority for consumer services.

Keywords: Consumer prices, consumer protection, the impact of state, implementation

1 THE INSTITUTIONAL FOUNDATIONS OF REGULATORY PRICING MECHANISM.

The most common and simplest in terms of organization is a form of price control by means of restrictive measures on price levels and their

individual components. While a market economy based on the competitive basis functioning of enterprises based on consideration of the individual demand and optimizes their costs precisely calculated before going on the market with their goods. Therefore, the role of state regulatory processes consists in influence on the formation of optimal cost and should be limited to the indicative regulation of the process the use of limited resources, the creation of unified planning

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methods and cost accounting that enable enterprises of different industries and ownership forms freely choose the structural elements of costs and spending records to compare prices for components of different manufacturers and products. The state should motivate enterprises to increase profitability by increasing production, improving product quality and increased efficiency rather than by easy way - higher prices for their products.

Economic and legal justification of principles price formation's processes is contained in the Law of Ukraine "On the Prices and Pricing", adopted at the end of 1990, which proclaimed most free pricing by economic entities for their products, regardless of ownership and subordination. According with Article 9 the government has the right to introduce state fixed or regulated prices and tariffs for resources that have a decisive influence on the general level and dynamics of prices for goods and services that are of critical social importance, and also on products, goods and services whose production is concentrated in enterprises that take monopoly position in the market that allotted by this government. In Article 10 of the Law, cautions to change the state fixed and regulated prices, allowed in connection with a change in the conditions of production and realization that are independent of economic activity of enterprises. However, as shown subsequent practice, this caution in an open economy did not play a deterrent role. Actually low efficient in terms of mass overpricing was and a special body, on which was entrusted obligation to exercise control over the observance of state discipline prices - the State Inspection for Control over prices. The purpose of activity this body was operative tracking of price dynamics on certain objects for monitoring and inspection exercise, during which in the case of breach of discipline prices take appropriate measures of influence to prevent unreasonable raise the prices of goods and services. The State Inspectorate for Prices has to protect the legitimate interests of citizens to influence on enterprise entities for the purpose of stability price dynamics, apply economic and administrative sanctions Infringements of state discipline of prices. Control measures were carried out in the form of checks validity of rules approved by the ministries and departments, enterprises and organizations within the limits of

their authority and regardless of ownership and management, prices and rates, inspection besides relied coordinating the work of state control over prices with other regulatory agencies and public institutions.

Regulation "On the State Inspection for Price Control" provided for wide enough powers, so during control checks of inspectors have the right to request the available bookkeeping documents, books, reports, calculation, etc., associated with the installation and use of prices, despite a trade secret. Employees inspection during the inspection may inspect production, storage, trade and other premises of enterprises and organizations that are used for the manufacture, storage and sale of goods and raw materials, and in case of violations of price discipline to demand their immediate elimination, suspend the operation of business entities in the accounts of banks and other financial and credit institutions. By results of the checks decisions were made about the use of the violators provided by the law of economic sanctions and considered as administrative penalties.

However, the State Inspectorate for Prices could not significantly counteract the inflationary process for several reasons. Firstly, the machine control authority was a not numerous and could not cope with the help of inspections of overpricing, as each verification required lengthy analytical work specialist. Secondly, the price inspection does not become a major element of a unified system of price controls, and could not become generator departmental and public control of pricing. Thirdly, were no institutional preconditions for the release prices which has led a strong motivation for the majority of economic entities in period of inflation expectations to an unjustified increase in prices, stop which are low-power control authority was not able to do.

During this period of formation the State authorities tried directive to set the limits of profitability, but released and the prevailing aggregate demand over supply rapid strides influence on price dynamics. Also fixing the standard profitability because the ratio of profit to the cost price cannot be a complete stabilizer, since in practice such regulator level due to the effect Averh-Johnson, which provides that an increase in fee income is possible if unchanged its

relation to costs and built up by increasing the denominator, in other words, an increase in production costs.

Price regulating legislative and regulatory framework, formed during the high inflationary development of the economy, was low efficient basis to contain prices. Made by the Government on the "fire order" at the end 1992 temporary provision "On state regulation of prices and tariffs", based on a command-administrative approach. His first action was circulated for public enterprises that regularly inflated the price or have a monopoly, later resolution of Cabinet of Ministers № 153 of 3 February 1993 his action was extended to non-state enterprises. While the mass was performed overpricing by economic entities, government price controls could not cope with the tasks to conduct price monitoring, thoroughly check the accuracy of products costing and control consumer prices.

Low effectiveness of regulatory measures in conjunction with the financial instability in 1993, gave rise to the highest, in recent history Ukraine inflation, and therefore the deepest decline in production so the amount of national income in 1994 decreased by 24.3%, while industrial production fell by 28% (Economy of Ukraine in 1994, 1995).

Effective monetary policy of the National Bank through the introduction into circulation of the hryvnia and favorable external financing of the economy gradually helped to achieve a relative stabilization of prices. Approaches in the use of instruments of influence on price were changed, government has moved from wide impact of regulatory means to narrowly direct. Cabinet of Ministers accepts October 21, 1994 resolution № 733 "On the pricing in restructuring the economy", which aims to bring the pricing adjustment mechanism to similar the existing sub-systems in developed market economies. Firstly, was reduced the range of regulated products, reduced by 30% for the declared price, limited use of marginal price levels and profitability levels within the limits of socially significant goods and services. Secondly, declaring the changes of prices began to apply only to businesses that occupied natural or artificially monopoly position in industry and regional markets. Thirdly, held decentralization of regulatory processes: more

and more rights in the field of control and direct impact on the price situation given for regional and branch of government. The regional authorities of executive power regulating the prices of fuel for the population, tariffs for public transport, water and heating, drainage, boundary trade allowances bread- products, fruit-vegetable products long term storage, drugs, limit levels of profitability for harvesting and grain enterprises. These powers were granted to the regional administration by the Cabinet of Ministers of Ukraine of 25.12.1996 № 1548 "On Establishment of Authority bodies of executive power and executive organs of city councils for the regulation of prices (tariffs)", State Department of Coal Industry, Ministry of Defence, Ministry of Transport, Ministry of Communications, Ministry of Finance set prices and tariffs on products of their subordinate enterprises. Fourthly, the government rejected the budgetary grants enterprises reducing costs of subsidizing housing and communal services.

These results were obtained by improving the mechanisms of direct price regulation that took of the two main directions: on the one hand, improved the legislative base for the prevention and elimination of price abuses of monopoly formations, on the other - introduced restrictive measures on prices of imported goods. High monopoly prices began to be seen as an abuse of its position, and treated as a violation of consumer rights under the Law of Ukraine "On Protection of Consumers' Rights", on the contrary monopoly low prices violated the competition and covered by the Law "On protection from unfair competition". Anticompetitive recognized any actions business entities that contradict the rules of trade and other fair customs in entrepreneurial activity. (Zakon, Law of Ukraine "On Protection Against Unfair Competition" from 06.07.96, 1996) Accepted in 1995 resolution № 135 which approved the "Regulations on the state regulation of prices (tariffs) for products of industrial supplies, consumer goods, works and services monopolies". Adopted in 1998, the Instruction "On the Procedure for the use of economic and financial sanctions by the state price controls" more clearly than previous normative documents regulated procedure for determining the price violations, and take measures to subjects that allows them. (1998) In particular, the bases for the application of penalties are:

- Accruals extra charges are required by law to regulated prices and tariffs;
- Use of free prices and tariffs for products with the introduction of the regime for their regulation;
- Use of product prices on the profitability level which exceeds the marginal;
- The use of prices in violation of established procedure of the obligatory declaration their change;
- Inclusion in the structure regulated prices are not provided by the law or the costs over set size;
- Inclusion in the cost of production, the price of which is regulated, not actually performed or not performed in full service (work);
- The use of trade and supply and marketing allowances in excess of the threshold;
- The use of prices and tariffs imposed in violation of other methods of regulation.

Over these violations was calculated amount unreasonably received revenue that was subject to seizure and absented in the income of the budget and used a fine of twice the amount of such revenue.

Started in 1994, disinflation in Ukraine, which was a consequence of the stabilization process in the money market and improving regulatory pricing levers of influence, changed in 1998 the initial stages of sporadic price shocks, the economy from time to time was going through sharp jumps in prices, which were caused by exchange rate fluctuations, changes in energy prices, price volatility of certain commodity markets. The application of state indirect effects on the price level rarely practiced: commodity interventions food from state reserves held impulsively, dotted only in certain regions, which of course could not stabilize the price situation.

Since the beginning of new millennium government accepted a number of legislative and regulatory documents whose purpose was to adequately and timely impact on the price increases. In 2000, the Cabinet of Ministers adopted resolution providing for provisions on State Inspection for Price Control, which defines that the main task is to carry out a governmental body control and supervisory functions for compliance with central and local executive bodies, The Council of Ministers of the

Autonomous Republic of Crimea, enterprises, institutions and organizations of the requirements for the formation, establishment and application of prices and tariffs. Pursuant to this Resolution the government authorized inspection to carry out except control and supervisory functions in economic entities control over the formation and use of cost of services that provided by various state governments on a fee basis for additional resources for their maintenance. Their cost formed on the basis of departmental normative documents and allowed during the budget deficit and reduces public spending enough to live comfortably in some public authorities. In order to streamline and unify approaches to monitoring studies Government adopted Resolution of the Cabinet of Ministers of Ukraine from 13.06.2002 № 803 "On measures for the monitoring of prices and tariffs for the consumer market". Resolution approved list of socially important goods and services which is held constant monitoring of prices and tariffs for the consumer market and conduct monitoring of prices and tariffs for the consumer market. In order to use the possibility of timely repayment of price fluctuations and the peculiar of preparation to price shocks state returns to the mechanism of influence on the formation of housing and communal tariffs by providing conclusion on the economically-based planning costs, and declare the value of socially important goods are produced by local manufacturers adopting "The order of formation of tariffs for removal of domestic waste", the Cabinet of Ministers of Ukraine of 26 July 2006 № 1010, and "The order of formation of tariffs for maintenance of buildings and structures and adjacent areas", the Cabinet of Ministers of Ukraine of June 01, 2011 № 869 and "The order declaration of change wholesale selling food prices", approved by the Cabinet of Ministers of Ukraine of 17 October 2007 № 1222.

In 20011, the Decree of the President of the State Inspection for Price Control was eliminated as a body. Six months, and if you count the organizational and preparatory period then almost a year in the state had no authority to which relied function of price controls. It is difficult to understand the logic but January 19, 2012 President of Ukraine signed a decree according to which was re-established State Inspection of Ukraine on price control and appointed its leaders.

March 30 approved the Regulation on inspection, and on 21 June, Parliament adopted a new law "On Prices and Pricing", which entered into force on 3 August. (Zakon, 2013) Due to these actions Inspection has acquired the status of the central executive body. Cabinet of Ministers of Ukraine in July this year the decision was made on the creation of territorial divisions State Inspectorate which are the structural units of the State Inspectorate staff, the number of employees they have reduced in tens times and reached 2-3 specialist in accordance with the provisions of the inspection, the main task for today are:

1. implementation of the state policy of price control by:
 - carrying out continuous monitoring, analysis and study of the dynamics of prices (tariffs) for the consumer market and operational support of the Cabinet of Ministers of Ukraine, government forecasting and analytical materials on the expectations of the price situation in the country;
 - introducing to Minister, central and local executive authorities proposals on the methods of influence on economic processes and price situation in the consumer market;
 - provision in cases provided by law, the conclusions on the economic justification of expenditure during the formation of prices (tariffs) for goods, works and services in respect of which introduced state regulation of prices (tariffs);
2. submission for consideration of Minister proposals for formation of state policy of price control.

Additions to existing legal instruments expanded powers and have the right carry out checks, but insignificant staffing number of territorial subdivisions of the State Inspection of Ukraine on price control does not allow effectively implementing the supervisory and controlling functions, this indicates that the state holds more hope for prevention, pre-pricing measures. The government also held a consistent policy on the provision of public available effective and quality medicines. The state operates a model of state regulation of prices, which is based on the National List of Essential Medicines (Resolution

Of Cabinet of Ministers Ukraine of 25 March 2009 № 333), that can satisfy the basic health needs of the population and who are selected based on evidence of effectiveness, expediency safety and rate of "cost-effectiveness".

At this time of all registered medicines, more than 40% of items are regulated at the state level. Besides the National List of Essential Drugs aimed at execution of programs related to state guarantees of Ukraine's population health care in inpatient and outpatient conditions, there is a list of drugs whose prices are subject to regulation and which will be able to purchase health care institutions, wholly or partly funded from state and local budgets, according with resolution Cabinet of Ministers of Ukraine on September 5, 1996 № 1071 and according with the order of Ministry of Health of Ukraine dated February 27, 2006 № 86. By the Order Ministry of Health of Ukraine dated 29 December 2011 № 1000 (as amended) has approved mandatory minimum range (socially oriented) medicines and medical products to pharmacies. Supervision of compliance with license conditions in pharmacies and pharmacy posts, including the execution of resolutions of the Cabinet of Ministers of Ukraine and the orders Ministry of Health of Ukraine, which affect the pricing policy of medicines, by the State Service for Medicines. Institutional support of price controls for two decades have passed no easy way of helpless attempts to curb the wave of massive rise in production during the liberalization of prices to stabilizing the price dynamics multifactor means of influence. The task of the state is not the freezing of prices, and operative and objective tracking prices in order to establish civilized norms pricing, creating limitations for abuse monopoly position, followed by adequate macroeconomic impact of the Government and the National Bank on consumer prices.

2 INSTITUTIONAL ARRANGEMENTS FOR CONSUMER PROTECTION.

The implementation of the national policy development of protecting the rights of citizens as consumers, in Ukraine began to ensure the legal and organizational - structural basis for the formation of the institutional framework in the country. Ukraine was the first country from the former USSR camp where was adopted by the Supreme Council of 12 May 1991 the Law "On

Protection of Consumers' Rights" which came into force on 1 October 1991. The law contained many fundamentally new for the Ukrainian law provisions, but because of lack of experience in this field of law-making, the original edition of the Law has not acquired the necessary consistency and completeness of its content repeatedly was amended and supplemented. According with the Cabinet of Ministers on July 1, 1992 (№ 297) was created a State Committee of Ukraine on Consumer Protection (State consumer protection). (Resolution, 1992) Later in accordance with the decree of the President of Ukraine "On Changes in the structure of the executive power" of 15 December 1999 was formed the State Committee for Standardization Metrology and Certification of Ukraine (State Standard) based on former State Committee of Ukraine on Consumer Protection and the State Committee Ukraine for Standardization, Metrology and certification. At the present stage the Ministry of Economic Development and Trade of Ukraine is the legal successor of the State Service of Ukraine for Technical Regulation in the part of formation and implementation of state policy in the sphere of technical regulation (standardization, metrology, certification, assessment (confirmation) compliance, quality management), well as formation and realization of the state policy in the field of consumer protection (other than functions for the implementation of state policy on state control in the field of consumer protection; functions of formation and realization of state policy on safety of food products). By Presidential Decree of 31 May 2011 the Regulations on the Ministry of Economic Development and Trade of Ukraine № 634/2011 in accordance with the tasks assigned to it were approved to:

I.

- ensure the formation and realization of state policy in the sphere of technical regulation (standardization, metrology, certification, evaluation (confirmation) of compliance accreditation of conformity assessment, quality control);
- ensure formation of state policy in the field of protection of consumer rights and exercises control over its realization;
- ensure interdepartmental coordination in the field of technical regulation and protection of consumer rights;
- organize the development of projects normative and legal acts on the protection of the rights and interests of consumers, advertising, standardization, metrology, certification, assessment (confirmation) of compliance quality control and approve them;
- organize public discussion drafts of normative legal acts that can severely affect the scope and content of the rights and interests of consumers;
- provide together with other central executive bodies, the Council of Ministers of the Autonomous Republic of Crimea, regional, Kyiv and Sevastopol city state administrations annual report on the status of the rights of consumers, bring it to the attention of state and local self-government;
- develop draft regulatory legal Acts regarding state support for the implementation of quality management systems according to the requirements of national and international standards;
- contribute to the development and implementation of quality management systems in the executive bodies, local authorities, enterprises, institutions and organizations;
- organize information support of the executive authorities, local authorities, enterprises, institutions and organizations on the implementation of quality management systems;
- take part in organization work on preparation and improvement of professional skill specialists in quality management, developing appropriate curricula, organization of fundamental and applied research in the field of quality management;
- provide generalization and promotion through the mass media, including its own web portal, national and international experience in quality management systems, organizes and participates in scientific international and national events with such matters;
- take part in organizing and realization of measures for cooperation with regional,

- European and international organizations for quality management;
- organize and monitors the introduction of quality management systems in the executive bodies, local authorities, enterprises, institutions and organizations;
 - organize and coordinate activities in the field of standardization, develops and approves regulations in this area;
 - form the program works on standardization;
 - take measures to harmonize national standards are developed with relevant international (regional) standards;
 - organize the development and harmonization of technical regulations and other regulatory legal acts on standardization;
 - establish rules for the development, approval, acceptance, review, change and loss of force of national standards, their designation, classification by type and other features, coding and registration;
 - approve and adopt national legislation in accordance with the standards, rules and classifications established practice;
 - perform in accordance with the laws of the registration standards and other regulations;
 - by request of the relevant of central executive authorities, create a list of national standards in the case of voluntary application is proof of conformity to product requirements with technical regulations, and the absence of such standards, arrange for their development;
 - take measures to fulfil obligations resulting from the participation of Ukraine in international (regional) organizations of standardization;
 - decide on the establishment and termination of the technical committees of standardization, determine their powers and the order of creation;
 - organize creation and maintenance of a national fund regulations and the National Information Centre for International Information Network ;
 - carry out on behalf of property rights to national standards, rules established practice, classifiers and directories;
 - organize according to laws of distribution official publications of national standards, rules established practice and classifiers and other printed matter concerning the accepted national standards and documents relevant international and regional organizations standardize and delegate these powers to other organizations;
 - organize the provision of information services for Standardization;
 - support and promotes cooperation between producers, suppliers and consumers of products, processes and services and relevant government authorities in standardization;
 - approve regulations on the national accreditation body, the position of the Accreditation Council and its composition, description and rules for the application of the national mark of accreditation rules for determining the value of accreditation, and exercise other powers on these issues;
 - coordinate the activities of the development and revision of technical regulations;
 - provide a program to develop technical regulations;
 - consider accordance with the legislation draft technical regulations and submit comments on them, approves the projects and submits in the prescribed manner to the Cabinet of Ministers of Ukraine;
 - organize the assessment of equivalence of Ukrainian and foreign technical regulations and provide appropriate proposals to the Cabinet of Ministers of Ukraine;
 - maintains a registry of technical regulations;
 - appoint the proposals of central executive bodies, which charged with technical regulations in certain areas, conformity assessment bodies and with the involvement of the central authorities monitors (supervision) conformity assessment bodies designated compliance with legislation, adopts decisions in accordance with the law on the abolition of destination;
 - lead National Register of designated conformity assessment bodies;
 - provide proposals for Ukraine's accession to the international (regional) systems of certification, the conclusion of international agreements in the field of assessment (confirmation) of compliance, makes decisions on the procedure for recognition of

- work carried out by the certification of other states;
 - coordinate the work of the central bodies of executive power in certain spheres of activity of the evaluation (confirmation) accordance to legislatively regulated sphere;
 - organizes the development of projects normative and legal acts establishing common requirements and rules of procedure of evaluation (confirmation) in the legislatively regulated sphere;
 - provides methodological assistance to central executive authorities in the drafting of laws and other normative legal acts of evaluation (confirmation) of conformity;
 - organize the preparation and attestation of auditors from certification;
 - hold and coordinates work according to the laws of ensure the functioning of the state system of certification;
 - keep the Register of State Certification System (National Register of certificates of compliance) and a register of declarations of conformity;
 - appoint certification bodies;
 - approve the list of products subject to compulsory certification in Ukraine;
 - examine the controversial issue of testing and certification compliance with the rules;
 - provide information on software evaluation (confirmation) of compliance and certification;
 - take part in relevant international and regional organizations of consumer protection, standardization, metrology, certification, evaluation (confirmation) of compliance, of quality management;
 - perform state management of traceability in Ukraine, provides a unified technical policy in the state to ensure traceability;
 - coordinate activities to ensure the functioning and development of the state metrological system;
 - coordinate the activities of the metrological service of Ukraine;
 - approve the staff of the Scientific and Technical Committee on Metrology and position of it;
 - organize holding of fundamental research in the field of metrology;
 - develop or takes part in the development of state scientific and technical programs related to ensuring the uniformity of measurements;
 - develop and approves in accordance with the laws normative legal acts and normative documents in the field of metrology and metrological activity;
 - organize the establishment and functioning standard base of Ukraine establishes the order of creation, approval, registration, storage and usage of standards and verification of standards with other states and international standards;
 - offer in the prescribed manner benchmark of the status of state;
 - set the definition of the basic units of the International System of Units (SI), the name and definition of derivative units SI, decimal multiples and partial units of SI, allowed off-system units and their designations and rules of writing, makes decisions on provisional application in a particular field of measurement units that are not included in the SI, multiple and partial to them;
 - organize and conducts the state metrological control and supervision;
 - approve the provision of metrological services of ministries and other central bodies of executive power;
 - provide representation and participation of Ukraine in international, European and regional metrology organizations;
 - organize and conducts the certification of production enterprises engaged in processing, recycling or destroy the circulation of substandard and unsafe products;
- II.
- provide the formation of state policy in the sphere of state market surveillance and supervise its implementation;
 - perform within the limits the competence of national market surveillance;
 - approve position of the Council of market surveillance and its composition, considering it developed proposal provides organizational and informational support its work;

- evaluate market surveillance submissions to the Cabinet of Ministers of Ukraine conclusions, recommendations and suggestions for improving the organization of market surveillance developed based on the results of this assessment;
 - provides the functioning and free access to the national information system of the market surveillance system and immediate mutual notification about the product, which is a serious risk;
 - coordinates activities in Ukraine's access to international, regional and foreign systems of communication about the product that poses a serious risk;
- Standardization, Certification and Quality” (SE “UkrSRTC”, Kyiv);
 - National Scientific Centre “Institute of Metrology” (NSC “Institute of Metrology”, Kharkiv);
 - State Enterprise “Scientific-Research Institute of Metrology Measurement and Control Systems” (SE “SRI system”, Lviv);
 - State Enterprise “Ukrainian Centre for Certification and Consumer Protection” Kyiv;
 - 28 local state enterprises of Standardization, Metrology and Certification;

They provide technical regulations as the basis of reliable consumer protection through a system of standardization, metrology, and certification:

III.

- develop appropriate proposals for harmonization normative and legal acts and regulations with international, including European, rules and standards that define requirements for trading activities and activities in the field of public services;
- develops and approves rules for trade in certain groups of goods, the provision of public services, work facilities restaurant industry, the implementation of different types and forms of trade, limiting the size of the write-off loss products in enterprises of trade and restaurant industry, and also order of their application state norms in commercial activities and domestic services;

In the Ministry of Economic Development exist permanent consultative and advisory body - the Council of State market surveillance, which is formed in order to prepare the agreed proposals on organization implementation of state market surveillance and control of non-food products. Ensuring implementation of the state policy in the field of consumer protection, standardization, metrology and certification implementation of management in this area, and also inter-sectoral coordination of functional regulation on consumer protection, standardization, metrology and certification shall through the system under the jurisdiction of state enterprises, which includes:

- State Enterprise “Ukrainian Scientific Research and Training Center of

Standardization - is an activity that is in establishing provisions for common and repeated use on existing or potential tasks to achieve the optimal level of regulation in a particular area, which results in the increase of the degree of conformity of products, processes and services to their functional purpose, remove trade barriers and promote scientific and technological cooperation.

Metrology - is the science of measurement, which includes both theoretical and practical aspects of measurement in all fields of science and technology.

Certification -is procedure by means of which recognized in the prescribed manner authority certifies the conformity of products, quality systems, quality management systems, environmental management systems, personnel requirements established by law.

Consumer policy - is the creation of favorable conditions for the saturation of the consumer market with quality and safe goods (works, services) increase the level of protect the health and safety of consumers, improving the legislation of Ukraine on protection of consumer rights and its adaptation to EU legislation.

Accordance with resolution of Cabinet of Ministers of Ukraine dated 13 September 2002 № 1371 “On the procedure of participation of the central bodies of executive power in the activities of international organizations of which is Ukraine” and on an agreement “On holding coordinated policy in the

field of standardization, metrology and certification” signed by Community of Independent States member-states March 13, 1992 in Moscow, Ukraine is represented in 9 international, national and regional organizations for standardization, metrology and certification:

- International Organization for Standardization (ISO);
- International Electro-technical Commission (IEC);
- European Committee for Standardization (ECS);
- European Committee for Standardization in electrical engineering (ECSEE);
- International Organization of Legal Metrology (IOLM);
- General Conference on Weights and Measures (GCWM)
- Organization of Eurasian Cooperation of National Metrological Institutions (COOMET);
- European Association of National Metrology Institutes (EURAMET);
- Interstate Council for Standardization, Metrology and Certification (ICSMC).

Legislative normative basis that covers consumer protection has more than one hundred normative and legal documents and for the period of the state more than once was changed and perfected. Besides, the Minister of Economic Development and Trade of Ukraine in the process of consumer protection involved a number of government agencies:

- The Ministry of Justice of Ukraine control over compliance norms of law-making and law enforcement;
- The Ministry of Health of Ukraine in accordance with the Regulations approved by the Cabinet of Ministers of Ukraine dated November 2, 2006 № 1542, exercises control over the production, appropriate mode of storage and marketing, quality drugs (Resolution No. 1542, 2006);
- The Ministry of Regional Development, Construction and Housing and Communal Services of Ukraine in accordance with the Regulations approved by the Cabinet of Ministers of Ukraine of 12 May 2007 № 717 protects the rights of consumers of utility

services within its powers defined by law (Resolution No. 717, 2007);

- Ministry of Agrarian Policy and Food of Ukraine in accordance with the Regulations approved by the Cabinet of Ministers of Ukraine of November 1, 2006 № 1541, provides according to the legislation implementation of state control and supervision over the quality and safety of agricultural products, raw materials and food, storage and sale; organizes certification of crop production, livestock, including breeding (genetic) resources, poultry and food processing industries (Resolution No. 1541, 2006);
- Ministry of Finance of Ukraine in accordance to the Regulation approved by the Cabinet of Ministers of Ukraine of 27 December 2006 № 1837 carries out state control over the circulation and accounting precious metals and precious stones, precious stones of organogenic origin and semi-precious stones (Resolution No. 1837, 2007);
- Ministry of Infrastructure of Ukraine in accordance to the Regulation approved by the Cabinet of Ministers of Ukraine on June 6, 2006 № 789, organizes and controls in accordance to the legislation work related to the safety of vehicular traffic and take measures to reduce the harmful effects of the operation of transport on the environment and ensure environmental safety in transport (Resolution No. 789, 2006);
- Ministry of Ukraine of income and charges in accordance with Art. 8 of the Law of Ukraine “On State Tax Service of Ukraine” are working to combat the illegal circulation alcohol and tobacco products (Zakon, 1991), and in accordance with Art. 11 of the Customs Code of Ukraine, taking measures to protect the interests of consumers of goods verification of (establishing authenticity) certificates of origin of goods from Ukraine (Mytnyy kodeks Ukrayiny, 2002);
- Antimonopoly Committee, in accordance with Art. 3 of the Law of Ukraine “On the Antimonopoly Committee of Ukraine”, exercise state control over observance of the legislation on protection of economic

competition on the basis of equality before the law, businesses and the priority of consumers, prevent, detect and deter violations of the law on protection of economic competition (Zakon, 1993);

- The local state administrations in accordance with Art. 16 Law of Ukraine “On Local State Administrations” exercise state control over the observance of the producers of standards, technical specifications and other requirements related to its quality and certification, compliance with sanitary and veterinary regulations, collection, recycling and disposal of industrial, household and other waste observance of the rules of beautification; compliance with trade regulations, consumer, transport, public services, legislation on consumer protection. (Zakon, 1999)

The realization of state policy in the sphere of state control over observance of the legislation on consumer protection by the State Consumer Inspection of Ukraine which is a specially authorized central body of executive power in the sphere of state control over observance of the legislation on consumer protection and activity is directed by the Cabinet of Ministers of Ukraine through the Minister of Economic Development and Trade of Ukraine. According to the approved by the President on April 13 of 2011 Regulations major tasks of the State Consumer Inspection of Ukraine are:

1. implementation of state policy in the areas of:
 - state control over observance of the legislation on consumer protection and advertising in this area;
 - State market surveillance;
 - State supervision over compliance with technical regulations, standards, rules and regulations;
2. submission for consideration Minister proposals for public policy in the areas of consumer State Inspection of Ukraine.

State Inspectorate for Consumer Ukraine shall exercise its powers directly and through its territorial bodies of the Autonomous Republic of Crimea, Kyiv and Sevastopol.

According with Art. 26 Law of Ukraine “On Local Self-Government” Local governments have the right to decide issues: adoption of Social and Economic development of the respective local communities, targeted programs on other matters of local government, according to the legislation establishing rules for trade in the markets for the violation of which provides for administrative responsibility. (Zakon, 1997) Based on the above responsibilities and needs of the community, local governments can create and fund from the budget of the territorial community own programs on consumer protection, as well as according with Art. 28 Law of Ukraine “On Protection of Consumer Rights” to create organizational units for consumer protection. (Zakon, 1997B) But, in reality, there are some major problems there are the lack of funds in the budget to create divisions and a certain deformation on the system of consumer protection by local authorities due to the mismatch of the current legal framework. For example in accordance with Article 28 of the Law of Ukraine “On Protection of Consumers’ Rights” structural subdivisions on issues consumer protection executive bodies of local self-government is entitled in detection goods of improper quality without the required information or supporting documents suspend or discontinue the sale of goods, but check business entities on compliance with requirements of current laws on the protection of consumer rights, the right to give economic entities mandatory for execution orders to cease violations of consumer rights belongs only to the regional executive body in the field of consumer protection. Also, local governments may establish in accordance with the legislation rules for trade in the markets, but according with the Code of Ukraine on Administrative Violations impose penalties for violations of the current legislation on consumer protection can only territorial executive authority in the field of consumer protection. (Zakon, 1998)

From these examples it is clear that it is necessary legislation to resolve the institutional legal conflict regarding the distribution of powers between the regional bodies of executive power in the field of consumer protection and local authorities.

Within the limits of the Law “On Protection of Consumers’ Rights” in Ukraine created a system of organizational and legal principles of activities of non-governmental organizations in the field of

consumer rights. Public associations consumers have the right to: conduct an independent examination and testing; to study consumer properties of products demand; to conduct a survey about the quality and price; organize legal and consultative assistance to consumers; to participate in the development of national standards; to protect consumer interests in government and the courts; contribute to the legal authorities materials to bring to justice those guilty of violating the rights of consumers and others. (Yazvinska & Ivanenko, 2001)

One of the main components of the institutional framework of the state which effectively protects the rights of its citizens have the right to independent consumer organizations to participate in the protection of consumers. Experience of democratic states demonstrates that democracy begins "from below" - through the participation of every citizen in matters relating to their living conditions, the most efficient mechanisms of involving citizens is public awareness, public consultation, public control, audit, monitoring. Existing consumer legislation and the law "On Local Self-Government in Ukraine", give every opportunity to include in the charter of the territorial community participation of citizens as consumers in resolving common to all the inhabitants of the respective district (community), the most important, priority issues of consumer services, but should clearly define the scope of these issues and limit the powers of the community.

3 CONCLUSION

Summarizing it should be noted that one of the main tasks Ministry of Economic Development of Ukraine is holding effectively pricing and protection of human rights as consumers. To perform control functions in the state created such central executive authorities as the State Inspectorate of Ukraine of price controls, and the State Inspectorate of Ukraine on issues of

consumer protection which at the present stage of development of our country there are not as effective as it need Ukrainian society and shows experience leading countries. In view of the above, it should be noted that this situation is due to several reasons:

- Low purchasing power and the level of satisfaction of physiological and spiritual needs of citizens, their legal exposure to the conditions of Liberalization state influence on the consumer market;
- A significant saturation of the consumer market counterfeit, adulterated and substandard products entering from both domestic producers and importers;
- Low efficiency of the judicial protection of the rights of citizens as consumers;
- Low efficiency of the existing system of state control over the consumer market and the lack of role and impact on the situation of public authorities, local governments and non-governmental organizations (structure and strength of the local inspection does not meet the requirements);
- Lack of clear distinction of rights and obligations between state authorities, local governments and community organizations;
- Due to orientation on subsequent control rather than on preventive measures increased administrative pressure on business entities, this is contrary to the principles of market economy and deregulation of business activities;
- The efficiency of local authorities calculated through indicators such as the number of violations, penalties, administrative violations whereas they must, first, to provide assistance to citizens in defending their rights in the courts and other authorities.

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METHODOLOGICAL ASPECTS OF QUANTITATIVE ASSESSMENT OF THE POLLUTION REDUCTION - STATUS AND TREND -

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Abstract

The methodology of analytical approach is based on establishing the parameters that characterize the essence of the developed phenomenon. The state of air pollution in particular is seen as the main factor that significantly affects the residents' livelihoods. At one and the same degree of negative pollution, its effect will depend on the number of residents living in the area. Therefore, for the assessment of air pollution reduction state, the two indicators were developed - harmful gas components in the air and population density in the area. Based on the hypothesis of parabolic type, the corresponding functional relation between the parameters proves, that the product of assumed parameters determines the priority of pollution reduction in some areas. To the upgrade option of renewed system equipment in order reduce contamination, we propose to use appropriate quantitative relations. They can determine the dynamics of pollution, depending on the innovative coefficient for pollution factors and investments in new equipment. Also, the dependence to assess pollution abatement in the implementation of multi-stage treatment systems is given. The conducted proposed approach to interpretation of dust pollution on the example of region of Poland is developed.

Keywords: Environmental pollution, Voivodships, industrial gas pollutants, investments

1 INTRODUCTION

In accordance with the European Environment Agency Air Quality in Europe report of 2013,

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'There are still major challenges to human health from poor air quality. We are still far from our objective to achieve levels of air quality that do not give rise to significant negative impacts on human health and the environment.' Janez Potočnik, European Commissioner for the Environment (EEA, 2013).

This means, that environmental security remains very actual topic in Europe and worldwide.



As it is stressed by United Nations Sustainable Development programme, the global partnership for development is crucial for international wellbeing and Millenium Development Goals implementation, however the economic policies of each country and region is on its own responsibility, and the regional sustainable is highly important here (U.N., The future we want, 2012).

At the same time, during Follow up international conferemce in Doha, Quatar of the United Nations stresses, that national development efforts need to be supported by an enabling international economic environment (U.N., Doha Declaration on Financing for Development: outcome document of the Follow-up International Conference on Financing for Development to Review the Implementation of Monterrey Consensus, 2008).

2 THE CONCEPT

The option of gas emissions that affects people is being considered. An important factor in favor concentration of harmful elements and the air. Equivalent to a certain extent characteristic of concentration is considered to be corresponding:

$$d = \frac{z}{s}, \quad (1)$$

where:

Z – emissions into environment,
S - emissions area.

With the increase of the negative component in the air, which is consumed in the process of human life, we should expect more significant damage to the human body at the same conditions. While analyzing the impact of pollution on humans there, the problem of identifying the quantitative relations between causes and consequences arises. In general the definition of the relevant laws requires a special complex and long-term research with specialists in various industries. At the same time to solve a number of practical problems is sufficient to approximate approaches that allow to take real effective solutions, in particular, on the basis of logical reasoning.

From the standpoint of selecting analytical interrelationships between factors we offer to focus on the Powers features the following:

$$e = cd^2, \quad (2)$$

where:

e – negative impact from the consequences of environmental pollution per capita,

c – constant coefficient.

This dependence is characterized by the fact that, firstly, in the absense of pollution there will be no negative consequences, that is consistent with logical reasoning. Secondly, there is non-linearity effects of pollution. This means that one and the same absolute reduction of pollution for its various levels leads to unequal results of its influence. For higher limits overall pollution effect of the measures to reduce it to grow. General idea for the pollution reduction priority in areas with high gas emissions concentrations should be considered quite reasonable and this approach is often used in the practice of management.

Lets assume, that on the certain territory N people are living, then the dependence (2) can be modified as follows:

$$E = Ncd^2 \quad (3)$$

By using the derivative apparatus for elementary functions that determine the quantitative relation between changes in pollution and its effect:

$$\Delta E = 2cdv\Delta Z \quad (4)$$

where v - population density in the area of contamination.

As can be seen from the dependence (4), the assumptions taken overall effect of the pollution is caused by changes in the product of two factors - pollution concentrations and density of the population living in the territory.

The priority towards pollution reduction require first of all areas with high degree of contamination and higher population density. The fundamental difference is the product of these two parameters.

Reducing pollution in general can be achieved in different ways - change in the sector structure of the economy, introduction of innovative technologies, the use of industrial waste,

construction of treatment facilities, carrying out a forestation and so on.

Typically, the implementation of such measures requires some investment costs. In terms of quantitative assessment of the effect of eco-investments requires identifying appropriate dependencies linking the size of investment with the value of the results obtained.

One way of such a dependence can be linear type functions such as:

$$\Delta Z = bK \quad (5)$$

where:

K – the volume of eco-investment,

b – constant coefficient.

For typical projects the pollution reduction capital intensity is known and can be used for the purposes of economic analysis of investment options. In some cases, may also be involved and analyzed a combination of standard and custom project developments.

Towards the important areas of pollution reduction shall be included fixed assets renovation, which, along with the savings of current production resources provides a better environment. A typical example to be considered is a renewal of vehicles that resulting in reduced fuel consumption per mile that accordingly reduces the amount of gas emissions.

Our studies revealed the quantitative regularities for the process of system update consistency of equipment in industrial plants, which can similarly be used to analyze the dynamics of pollution.

In particular, it should be considered a reasonable to use the following quantitative patterns:

$$\Delta Z = \frac{Z_0}{F_0} k_{iH} K, \quad (6)$$

where:

Z_0 – pollution emissions in the operation of machines in the base period.

F_0 - the original equipment cost,

k_{iH} – innovativity coefficient, based on pollution factor,

K – cost imposed by the new equipment

The analysis of the dependence shows that investments's eco-efficiency is determined primarily by the size of the ratio of pollution to the cost of fixed assets in the base period of operation.

Also significant value has the innovative new technology that characterizes the "jump" to reduce pollution when replacing existing technology innovation. I should add that this factor is determined by the parameters of existing and new technology.

In accordance with presented dependence more investments correspond to a current number of vehicles, which in turn intensifies the reduction of pollution.

However, it should be noted, that this directly proportional dependence occurs in the form of approximately stable volumes of production. If the dynamics of these volumes occurs, the indicated dependence shall be slightly adjusted.

Of course, the environmental effectiveness of a new technology depends on its technological purpose, the rate of technological progress, industry conditions and so on.

The variety of vehicles and assets raises the problem of determining the best areas of the eco-investments, and those investments that tangentially affect the state of pollution. Let's analyze a number of parameters of air pollution on the example of Poland - Voivodships. The table 1 indicates the relevant statistics for the period 2005-2012 year (CSO, 2013).

Overall, during the study period, pollution by dust has decreased by large size - about 2 times. At the same time gas pollution emissions decreased by 19%. Significantly (by 45%) were reduced the emissions of sulphur dioxide.

On the same level remained emissions of carbon dioxide and nitrogen oxides.

Taking into consideration the current trends, we can conclude that dust contamination is possible to reduce more rapidly, including through the use of appropriate technology filtering gas mixtures.

Table 1. Emission and reduction of air pollutants in Poland 2005-2012

	Emission of pollutants in th.tons	2005	2010	2011	2012
1	Dust	111	63	58	52
2	Particulates from the combustion of fuels	89	45	40	37
3	Cement and lime particulates, fire-resistant materials	3	2	3	2
4	Gases (excluding carbon dioxide) of which	2007	1704	1665	1627
4.1	Sulphur-dioxide	856	519	503	469
4.2	Carbon-oxide	326	344	341	334
4.3	Nitrogen-oxides	351	341	332	316

Using the raw data, we develop such quantities as population density, the ratio of its size to the size of the residence surface area and the average concentration of pollution - emissions related to the size of the territory they pollute.

Taking into consideration obtained data under the proposed approach we shall multiply the results and thus will determine the Voivodeship rating factor on the priority pollution reduction.

The relevant statistics on plant equipment that ensures the reduction of air pollution in Poland in 2012 is shown in Table 2 (CSO, 2013).

Table 2. Basic air pollution reduction systems in plants 2012

Equipment	Equipment efficiency			
	total	low	moderate	high
1. Cyclones	3255	478	878	1899
2. Multicyclones	965	141	260	564
3. Fabric filters	5500	581	1259	3660
4. Electrofilters	577	35	91	451
5. Wet air cleaners	1168	459	296	413

For some types of equipment, there are three levels of performance: low, medium and high.

Obviously there is a difference in the cost of the equipment, which makes specific factory rational choice alternative treatment. In some cases improve treating achieved by means of multiple staging of this process. For example, two stages option purification takes place the following quantitative relation:

$$U = U_1 + (1 - U_1) \cdot U_2,$$

where:

U – share of "hard" phase mixture shown cleaning system in relation to the amount of "hard" phase input,

U_1 – share of "hard" phase, which remains after the first stage of filtration.

U_2 – fraction of the solid phase, which remains after the second stage of filtration.

If we consider the value of entered indicators as filtration efficiency, the overall efficiency in some way connected with the relevant local efficiency. If for example we assume that $U_1 = U_2 = 0.8$, then the resulting efficiency is equal to $U = 0.96$. That is already a two stage filtration that provides a significant effective performance compared with similar local efficiency.

The economic problem here is that increasing stages of filtering significantly increases the cost of the equipment, while increasing efficiency to a lesser extent.

This is an important law, since there is a need to correlate the cost of the equipment with its performance.

Let's take a regional interpretation of equation (4) as an example the emission of dust pollution on the territory of Poland Voivodships. Relevant primary statistics are given below in Table. 3 (Voytsekhovska V. , 2011).

The statistical data are further used to determine for each of the Voivodships concentration of gas emissions and population density in the area. The product of these indicators can serve as a measure of pollution's reduction efficiency (rate).

The results of the corresponding calculations are presented in Table 4 (CSO, 2013).

Table 3. The statistical data concerning population parameters, area and amount of dust pollutants emission, Polish Voivodeships, 2012

	Voivodships	Population mln. people	Area in th. km ²	Particulate dust pollutants emission, in th. tones
1	Lower Silesian	2.9	19.9	4.0
2	Kuyavian-Pomeranian	2.1	18.0	3.9
3	Lublin	2.2	25.1	2.1
4	Lubusz	1.0	14.0	1.2
5	Łódź	2.5	18.2	3.4
6	Lesser Poland	3.3	15.2	3.9
7	Masovian	5.3	35.5	4.6
8	Opole	1.0	9.4	1.2
9	Subcarpathian	2.1	17.8	1.7
10	Podlaskie	1.2	20.2	0.9
11	Pomeranian	2.3	18.3	2.8
12	Silesian	4.6	12.3	10.6
13	Świętokrzyskie	1.3	11.7	2.7
14	Warmian-Masurian	1.4	24.2	1.2
15	Greater Poland	3.5	29.8	4.0
16	West Pomeranian	1.7	22.9	2.6

The comparison of ratings is showing, that the top three priority on reducing pollution include the following Provinces: Silesian, Lesser Poland, Lower Silesian.

The results are conditioned by the fact that in these Voivodships is the largest concentration of pollution and population density living in these areas.

The reason for it should be considered as the presence of large scale industrial production, which requires the involvement of a significant number of employees and activities which are based on industry specifics, that are related to pollution.

Priority means that first of all shall be implemented the environmental initiatives in these areas.

Table 4. The definition of Voivodeship rating for reducing dust pollution

Nr	Voivodships	Population density, mln. ppl./ th. km ² , v	Pollution concentration, th. ton/ th.km ² , v	100dv, indicator	Ranking of pollution influence
1	Lower Silesian	0.15	0.20	3.0	3
2	Kuyavian-Pomeranian	0.12	0.22	2.6	5
3	Lublin	0.09	0.08	0.7	13
4	Lubusz	0.07	0.09	0.6	14
5	Łódź	0.14	0.19	2.7	4
6	Lesser Poland	0.22	0.26	5.7	2
7	Masovian	0.15	0.13	2.0	7
8	Opole	0.11	0.13	1.4	10
9	Subcarpathian	0.12	0.10	1.2	11
10	Podlaskie	0.06	0.04	0.2	16
11	Pomeranian	0.13	0.15	1.9	8
12	Silesian	0.37	0.86	11.8	1
13	Świętokrzyskie	0.11	0.23	2.5	6
14	Warmian-Masurian	0.06	0.05	0.3	15
15	Greater Poland	0.12	0.13	1.6	9
16	West Pomeranian	0.07	0.11	0.8	12

But the choices of eco-investments significantly affects the readiness of technical and technological solutions. Also important factors include absolute and specific costs, including such factors as capital intensity reduction of pollution (Voytsekhovskyy, Voytsekhovska, & Symak, 2012).

As was previously analyzed from the two areas of air quality improvement for dust pollution better results are achieved, which decreased more rapidly.

A priori, this can be explained by the fact that there are appropriate technical solutions that do not require for their implementation major capital expenditures. At the same time, the chemical nature of pollution may require more complex

development projects and significant capital investment.

Do not forget about the diversification aspects of environmental activities. In the majority of cases, the environmental measures of Voivodships are carried out independently at their own expense and opportunities. A compromise between the interests of the community as a whole and the community in some areas can be achieved through the introduction of appropriate criteria and constraints. Some approaches in this direction, were considered in (Voytsekhovska V. , 2011) (Voytsekhovska V. , 2012).

3 CONCLUSIONS

The performed studies have shown that the choice of parameters quantifying environmental assessment must take into account the impact of pollution from the beginning of the livelihoods of one man, and then summarize the number of residents living in a particular area

When it comes to air pollution, the output parameters should be considered a harmful gas in the air, the component that is correlated with the amount of gas emissions per unit of area. For residents of the entire territory of the overall pollution impact is considered additive that is proportional to the population

The statistical analysis of Polish Voivodeships illustrates, that these indicators and their product significantly differ for different areas. Because of this latter figure may be used to identify priority areas for the implementation of measures to reduce pollution. Selecting appropriate investment projects requires further assessment of the eco-costs effectiveness, which is largely dependent on the degree of innovation of new technology. The strategy to reduce pollution at the country level should be consistent with the eco-activities for individual Voivodeships considering the level of local pollution, their industrial specific as well as general and local resource capacity allocation formation and implementation of eco-investment projects.

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ALTERNATIVE POSSIBILITIES OF DETECTION OF MANIPULATION WITH THE ACCOUNTING DATA

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Abstract

The fraud reporting and data manipulation is discussed across the various scientific fields – in economy, finance, sociology and many others. Particularly, the economic and finance data are under the strong scrutiny. In literature we can find extensive discussion on the creative accounting, which is considered as the source of the intensive data manipulation. It is pointed on the fact that the managers may adopt various methods to manipulate the financial statements of their firms to show their higher/better performance and to receive the higher managerial earnings. The Benford law as a statistical tool is illustrated as a possible tool in detecting this problem.

Key words: accounting data, creative accounting, data manipulation, Benford Law

1 INTRODUCTION

Statistical information plays an important role in decision making processes on all managerial levels. It is on the macroeconomic level, as well as on the level of individual companies. The qualified managerial decision could be derived only on the base of the reliable information. This is the reason why researchers and managers try to work with the highest quality data. This is true particularly with economic and financial data, which mirror the activity of individual companies. Various legislative tools and methodological guidelines

have been developed to assist the companies in generation and processing their accounting data according the internationally adopted standards. Among them, the international financial report standards, as well as the methodological specifications of the national accounts could be mentioned.

Despite all these efforts, the increasing number of various fraud reports and manipulations with accounting data is reported over last years, many of them with serious negative impacts on international economies. As an example the following cases could be recalled.

The Lehman Brothers (2008) with the Global financial services firm hid over \$50 billion of toxic assets in loans disguised as sales. They created the impression Lehman had \$50 billion more cash

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and \$50 billion less in toxic assets than it really did. The Lehman Brothers which was ranked the number 1 as the most admired securities firm by Fortune magazine in 2007, went bankrupt.

Bernie Madoff Scandal (2008) and his Investment Securities LLC, the Wall Street investment firm tricked investors out of \$64.8 billion through the largest Ponzi scheme in history. Madoff was sentenced to 150 years in prison and \$170 billion of restitution.

Indian IT services accounting firm Satyam (2009) falsely boosted revenue by \$1.5 billion. The chairman Ramaling Raju falsified revenues, margins and cash balances. He admitted the fraud in a letter to the company's board of directors. Raju and his brother charged with breach of trust, conspiracy, cheating and falsification of records. Finally they have been released after the Central Bureau of Investigation failed to file charges on time.

Over the last years, many smaller scandals, with serious direct negative consequences on national and world economies have been reported. The indirect negative consequences through the shadow economy and tax avoidance are observed as well.

The statisticians, accounting and IT experts intensively work on the new approaches, which would help to identify the fraud accounting operations before the infiltrated or falsified data are archived into the officially recognized statistical databases.

Our paper presents the selected methodological tools enabling to check the quality of the data of the larger information data sets.

Namely, we present an alternative approach to the data quality checking, known as Benford's Law, which in certain situations could be an important tool for detecting the distorted statistical and accounting data.

2 LITERATURE OVERVIEW

The fraud reporting and data manipulation is discussed across the various scientific fields – in economy, finance, sociology and many others. Particularly, the economic and finance data are under the strong scrutiny. In literature we can find extensive discussion on the creative accounting,

which is considered as the source of the intensive data manipulation. It is pointed on the fact that company management may adopt various methods to change the financial statements to show the improved performance of the company - one of them is creative accounting.

Creative accounting is the manipulation of financial numbers, usually within the law frame and accounting standards, but also very much against the spirit of the law and not providing the true information on the company under discussion. By Gosh (2010) the key attacks from creative accounting are concentrated manipulation with data through:

- Calculation of premature or fictitious revenue
- Aggressive Capitalization and Extended Amortization Policies
- Misreported Assets and Liabilities, and
- Problems with Cash-flow Reporting.

All of the above indicated acts may cause serious damages to the companies, institutions, owners and business partners. It is the reason why they should be detected and prosecuted.

According the businessdictionary.com accounting fraud is defined as: "The intentional misrepresentation or alteration of accounting records regarding sales, revenues, expenses and other factors for a profit motive such as inflating company stock values, obtaining more favorable financing or avoiding debt obligations. Employees who commit accounting fraud at the request of their employers are subject to personal criminal prosecution". (businessdictionary.com, n.d.)

The identification of the intentionally improper manipulation with the data is not an easy task, because it could be covered by the top managers and their interest to present their economic results in the best way and to get the highest managerial earnings. An interesting study was done by Henselmann, Ditter and Scherr (2013), according whom "...the objective of financial accounting is to provide an aggregate reliable and verifiable view of financial and economic performance to stakeholders by translating business transactions into accounting numbers. Given that accounting numbers serve as the basis for stakeholders' decisions or for determining compensations,

managers have diverse incentives to manipulate earnings...”.

To deal with this problem, the authors are proposing the application of the extensible business reporting language – XBRL, which is based on the generally accepted accounting principles applied in USA. More details could be find in Homer (2008), Mahoney and White (2007) and IFRS Foundation (2013).

In order to identify or even to prevent the fraudulent acting the responsible managers can adopt some specific statistical tools, which can signal the fraud attempts at very beginning. The various measures and approaches have already been developed and applied in managerial and checking practices. One of them is based on the empirically derived knowledge on the statistical incidence of the numerical figures on specific positions.

The Benford’s Law is an empirically derived and validated rule according which the numerical data starting with an arbitrary figure of 1, 2,..., 9 occur in large size data files with a certain, exactly defined frequency. The first attention to this fact was studied by Newcomb (1881). This regularity was in 1938 confirmed by Benford (1938).

According the Benford's Law the frequency of appearance the numerically defined data

beginning with figure d ($d=1, 2, \dots, 9$) in sufficiently large data sets is defined by the formula:

$$F(d) = \text{LOG} (1+1/d) \quad (1)$$

The situation is presented in Table 1.

Table 1 Frequency of appearance the numbers with the first digit d (%)

First d	Frequency of appearance	
	$F(d)=\text{LOG}(1+1/d)$	in %
1	0.3010	30.10
2	0.1761	17.61
3	0.1249	12.49
4	0.0969	9.69
5	0.0792	7.92
6	0.0669	6.69
7	0.0580	5.80
8	0.0512	5.12
9	0.0458	4.58
Total	1	100

The Benford’s frequency distribution is graphically presented on Fig. 1. It is evident that the frequency of appearance of numerical data according their first digit differs significantly. While numbers starting with digit **1** occur with frequency 30.10 %, the numbers starting with digit **9** appear with only 4.58 % frequency.

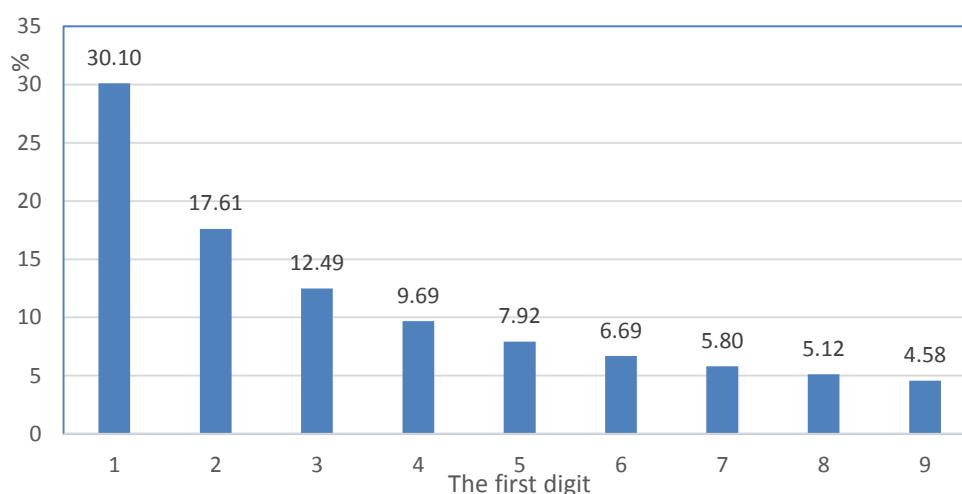


Fig. 1 Frequency of appearance the numbers with the first digit d (%)

In accordance with the basic rules of probabilistic operations it can be shown that numerical data beginning with the digits 1 or 2 occur in the studied group with frequency

$$F(1 \text{ or } 2) = F(1) + F(2) = 30.10 + 17.61 = 47.71\%$$

This means they would represent nearly half of the studied data. Analogously, numbers beginning with the digits 8 or 9 appear totally only with frequency 9.69%. Similarly, it is possible to construct frequency filters for testing frequencies

of occurrence of numbers in various combinations of first digits. These and the other tests could be incorporated into specific procedures for checking the regularity of frequencies in appearance of data in the referred data sets.

In analogy with the frequency distribution of the data according **the first digit**, such empirically derived regularities are valid also for the frequency appearance of the digit on **the second, third, and consequent positions**.

According to equation (1) it could be calculated that numerical data beginning with a pair of digits

“11” occur in a large data file with frequency 3.78%, the number starting with a pair of digits “12” occur with frequency 3.48% and those beginning with a pair of digits “19” occur only with a probability of 2.23%. By simple procedure we can find that the frequency of occurrence of numbers that starts with any of the two digits 10, 11, 12, ..., 18 or 19 is equal to 30.01%, which is simply equal to the frequency of occurrence of data starting with digit 1. These calculations, as well as some more sophisticated could be derived from the data in Table 2.

Table 2 Frequency of appearance the numbers with figures d_1d_2 at the first and the second positions

d_1	$d_2 >$	0	1	2	3	4	5	6	7	8	9	$F(d_1)$ at 1 st
1		0.041	0.038	0.035	0.032	0.030	0.028	0.026	0.025	0.023	0.022	0.3010
2		0.021	0.020	0.019	0.018	0.018	0.017	0.016	0.016	0.015	0.015	0.1761
3		0.014	0.014	0.013	0.013	0.013	0.012	0.012	0.012	0.011	0.011	0.1249
4		0.011	0.010	0.010	0.010	0.010	0.010	0.009	0.009	0.009	0.009	0.0969
5		0.009	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.007	0.007	0.0792
6		0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.006	0.006	0.006	0.0669
7		0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.005	0.0580
8		0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.0512
9		0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.0458
$F(d_2)$ at 2 nd		0.120	0.114	0.109	0.104	0.100	0.097	0.093	0.090	0.088	0.085	1.0000

Graphical comparison of two distributions – frequency occurrence of data according the first and second position digits is shown on Fig. 2. E.g., it could be estimated that data with **the first digit**

“1” will appear with 31.01 % frequency, while data with **the second digit “1”** will appear with 11.4% frequency only.

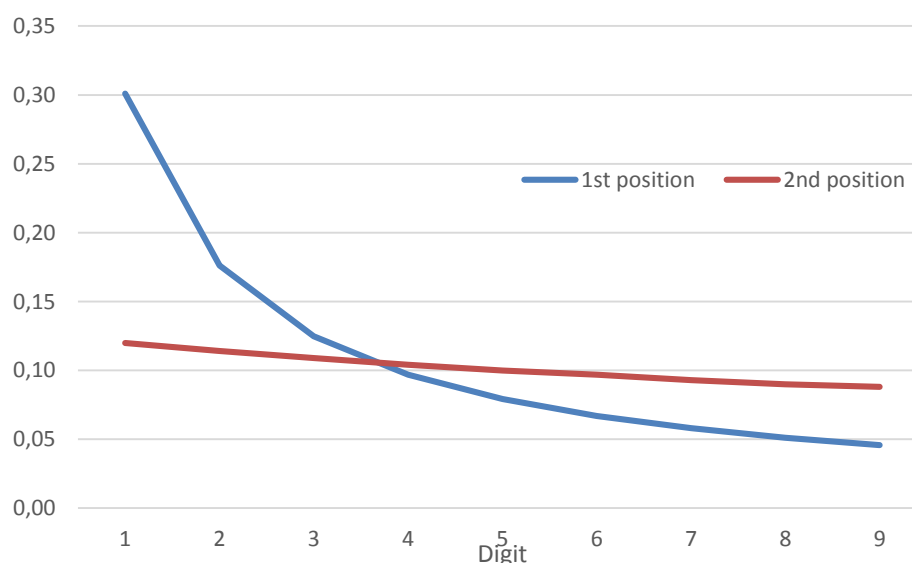


Fig. 2 Frequency of appearance the numbers with d_1 at the 1st and d_2 at the 2nd positions in %

For proper application of the referred testing procedures should be noted that Benford's law has general validity for any data sets, regardless of content which these numbers represent. An important prerequisite for the reliable application of this procedure however is that the value of the data examined are not explicitly limited (setting their minimum and maximum values), or otherwise externally influenced. Examples of data files which are not following the Benford's distribution are the data on values expressing the social benefits defined by legislative measure, data on wage tariffs, which are defined by the special legislation or negotiation by trade union and employers, data on economic results of enterprises that are functionally interdependent (as auxiliary variables - profitability, productivity per worker, or per unit of time, etc.). We should be also careful when working with data, which are directly defined by legislative standards or any internally applied rules (e.g. jubilee benefits, social needs compensations, various health care entitlements, duty travel compensation, etc.).

3 RESULTS

The economic problems that currently deal with almost all countries of the European Union require intensive mobilization of all domestic resources. One of the approaches that meet these requirements includes consistent monitoring of tax evasion. Particular attention is paid to identification of the improperly or even fraudulently reported balance sheets for calculating tax returns, which are frequently identified with the creative accounting and tax optimization. These methodologies are almost regularly offered as a part of the accounting education at universities.

The natural question, when dealing with the tax evasion and fraudulent tax reporting, is who are the main actors of this game? Based on extended literature sources there are several group of actors, who in varying degree with different weight participate, encourage or support the creative accounting and fraudulent reporting. Among them are:

- Managers of businesses who are interested in short-term business successes,
- Investors seeking the most effective increase of their financial resources,

Employees involved in recovering company's profit, and

- Owners (shareholders) interested in short-term profits, but also in better presentation of their businesses.

From 90s is evident progress toward intensive development support control instruments in the field of accounting and auditing. The extraordinary development has made **forensic accounting** as a separate component of the methodology of accounting and auditing.

Given the complexity of the accounting agenda the forensic accounting is forced to apply the new modern statistical methods and software applications. Possibility of simultaneous controls of the large information files with complex multi-level cross checking of these files has opened new and wide possibilities for increasing the effectiveness of such controls.

Experience in this area varies from country to country. Applications of the most sophisticated methods in the auditing practice are known in the U.S. where, for example, the methodology of data quality assessment based on Benford law became an organic part of the official audit procedures. Despite this fact, however, these exact tools are not generally accepted and considered as the decisive checking tools. The results obtained through such tools must be analyzed also by the classical qualitative analysis. Equally cautious on general application of the Benford's methodology is also the academic literature.

The deeper analysis of the accounting data according to Benford's methodology will be presented on real accounting data generated by custom administration. This account contained 5 000 items. Results of the analysis of this data set in terms of their frequency distribution according the Benford's law are presented in **Table 3** in following order:

- The first column - the first digit of the numerical data under study **d**
- The second column - expected frequency of occurrence of the data **T_i**
- The third column - empirical frequency of occurrence of the data **E_i**
- The fourth column - difference of frequencies **T_i** and **E_i**

Table 3 Custom statistics data – 5000 numbers

Frequency of incidence of data with the first digit			
First digit	Ei	Ti	Ei-Ti
1	32.748	30.103	2.65
2	16.601	17.609	-1.01
3	13.38	12.494	0.89
4	8.28	9.691	-1.41
5	7.144	7.918	-0.77
6	6.835	6.695	0.14
7	4.811	5.799	-0.99
8	5.513	5.115	0.40
9	4.687	4.576	0.11
Minimum			-1.41
Maximum			2.65
SUM of absolute differences in %			8.36

As shown in the table there are some differences between expected and empirical frequencies in occurrence the numerical data on accounts under consideration. The data starting with digit 1 represent 32,86% of the total number of numerical data, which is 2.76% above the expected frequency, in case of data starting with digit 2 the difference is 1.04%. The sum of these deviations for all first digits in absolute values reaches 8.47%. The largest positive deviation of empirical and expected frequency was identified at numerical data starting with digit 4, while the largest negative deviation is connected with data containing figure 1 on the first position.

The frequency occurrence of the data in this file has been examined also in terms of consistency with the frequency according the second digit. The results are summarized in Table. 4

Table 4 Custom statistic data – 5000 numbers

Digit	Ei	Ti	Ei-Ti	Abs
0	12.34	11.97	0.373	0.373
1	11.21	11.39	-0.181	0.181
2	10.92	10.88	0.042	0.042
3	9.95	10.43	0.479	0.479
4	9.49	10.03	0.543	0.543
5	9.93	9.67	0.266	0.266
6	9.51	9.34	0.171	0.171
7	8.27	9.04	0.761	0.761
8	8.96	8.76	0.205	0.205
9	9.41	8.50	0.908	0.908
Total	100	100	0	3.929

In the studied data set there are approximately 3.9% of the data which are not consistent with expected distribution. The highest rate of the non-complying data is linked to those starting with figures 9 (-0.908) and 7 (+0.761). There is a natural question – how important or negligible these deviations are?

More detailed applications could be found in Kabat, Siller, and Majkova (2014), where some selected data of the balance sheets of the Slovak firms according their NACE structure are presented.

4 CONCLUSION

The above presented case illustrate that the introduction of reliable information support significantly improves the possibilities for checking the quality of accounting information. The Benford's methodology, as well as the EBRL applications, could serve as an efficient starting point for dealing with the problem of manipulation with the accounting data.

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PROBLEMS OF TOURISM DEVELOPMENT IN THE REPUBLIC OF SERBIA

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Abstract

Tourism represents one of few real chances for significant development that Serbia have. Serbia is rich in natural and cultural resources. Great variety of tourism resources concentrated in Serbia provides many possibilities for tourism development. In order for tourism to become one of the main strongholds of Serbian economy, there must be a strategy that will give guidelines for its future development. There are several main problems of Serbian tourism. Biggest one is the lack of traffic infrastructure. Also, Serbia is not very well recognized as attractive tourist destination. Tourist facilities are insufficiently developed. Also, the structure of employees working in the field of tourism industry in Serbia is problematic. The fact that tourists stay in Serbia between three and five days, means that tourists are not very well informed about the possibilities that Serbian tourism offers. Making Serbia globally recognizable as an attractive tourist destination is a task reachable only whit the synergetic effect of all relevant factors in this process.

Keywords: *Tourism, development, problems of segmentation, resources, solutions, advantages*

1. INTRODUCTION

Tourism is targeted as one of the key instruments of Serbia's economic development in the near future. Richness and diversity of its natural and cultural resources, give Serbia possibility to become recognizable tourist country. To make it possible Serbia must have strategy that will guide its way to tourist map of the world. Problems that Serbia has to face during this proces are many, like recent political history, problems related whit tourist infrastructure, profiles of employees in tourism, lack of recognition among tourists, as well as deficiency of tourist demand.

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Whitout state strategy that will cover every aspect of tourism development, it will be impossible to obtain the level needed for establishing Serbia as respectable tourist destination.

2. TOURISM IN SERBIA

Tourism has a potential to become one of the most profitable industries in the country. But, Serbia is very fragmented as a tourist destination (Popesku, 2011.). To obtain that goal, tourism potential must be recognized by state not only as possible solutions and future plans, but also trough concrete steps that will help achieve that goal. This is necessary because without help from the state, there is so little that a single organization or expert could do. In other words without state help it will all remain in area of possible dreams.



It seems like Serbia stood aside, while the tourist market was developing, adjusting tourist product for more specific target markets (Bakić, 2005.), Serbia is still struggling with segmentation of its tourist offer. To be more precise, it hasn't done much in this area in last twenty years. It seem like there isn't enough will for this matter among tourist experts in Serbia. If we know that strategy for tourism development is still in primary steps, and plans are still to be written, it is no surprise that specific steps such as segmentation is yet to be achieved. It will be difficult for Serbia to reach a certain level of touristic demand increase without this step, so this may be the critical step in making Serbia well recognized tourist country.

Serbia isn't compatible with concept of modern tourism, and it is necessary to make new strategic planning through team work of all factors (Ceranić, 2003.), relevant for development of tourism in Serbia. Main problem for strategy planning is absence of clear vision what is tourism for Serbia and what are the main goals that should be achieved. If vision is clear and strategy gives firm guidelines for development of tourism, it will be easier to make plans for positioning tourist offer of Serbia on global tourist market. To achieve this vision, it is important to realistically perceive what is Serbia current position in the world, what do people of other countries know and think of Serbia, was it recognized as a tourism destination in the past, what are the advantages that Serbia have and can use in her benefit, is there something unique in tourism offer that Serbia can offer to the customers. Also, it must be determined what is tourism position in Serbia development plans, what are expected benefits of tourism expanding, and how big growth is expected in touristic demand for Serbia in near future. If the vision is determined correctly, next step will be to make clear and reachable goals, that will help in realizing what is needed to be done so Serbia can become wanted tourism destination. If previous steps are done correctly, than plans for putting Serbia on global tourist market can be done whit precise steps and obtainable goals that can be achieved.

Market segmentation reveals target markets and provides right way for full-filling market demands (Živković, 2007.). What differentiate one destination from another are both natural beauty and the number of historical events that happened

in the region (Biederman, 2008.), so we can say that Serbia is on right path to become recognized tourist destination, during the fact that there are more than 1300 protected natural objects (Štetić & Šimičević, 2008.) and numbering all the historical events from past and present that took place in this part of the world. On the other hand, this is only the first step, because every successful destination is a product of integral planning that represents an integrated area which contains accommodation, attractions, local community involvement and transportation (Y. Gee and oth., 1997.). Serbia can use the knowledge that countries in this part of the world have in tourism development to upgrade her own, but it must be aware that every destination has its own advantages and shortcomings, and there is no comprehensive solution for every destination (Lopez-Guzman, Sanches-Canizares & Pavon, 2011). Tourist market is constantly reshaping following the demand of ever growing tourist population, so future destinations will emphasize value and visitor experience, rather than the volume (Cooper, Fletcher, Fyall, Gilbert & Wanhill, 2008). If all that is known than it is understood that Serbian tourist market is still to be segmented in a way that modern tourism market demands.

3. SEGMENTATION OF SERBIAN TOURISM

Market segmentation enables to determine target market or markets through separation of the market in different groups of tourists, based on their demand (Živković, 2005.). Because of lack of tourism development in last couple of decades, market segmentation of Serbian tourist offer in on the very beginning. There are parts that believe that chance lies in rural development, because rural tourism helps diversification of rural economics (Zrilić, 2011.), others on the other hand think that chance lies in archeological discoveries, Lepenski vir is regular in offer of tour operators from Germany, Holland and Austria, as of 2009 year (Matijašević, 2009.), while government institutions see chance in developing river tourism, so "Were Danube meets Balkans" promo was realized in year 2006 (Službeni glasnik Republike Srbije, 2006.). This variety of guidelines suggests lack of coordination of parts involved in diversification of tourism offering in Serbia. In order to achieve proper segmentation every part

of Serbia tourism offer must be taken into consideration, and only then can one have clear picture what are strengths and weaknesses and what should be done in order to make Serbia tourism offer not only well segmented, but also organized in a way that should give her a possibility of firm tourism growth. Some of the following segments should be taken into consideration when tourism segmentation in Serbia is in order. There are numerous historical monuments, natural heritage sites, national parks, spas, ethno villages, medieval castles, musical and traditional manifestations, that all make part of tourism offer that Serbia can provide today.

City break is probably the most popular segment among foreign tourists, which usually discover Serbia through city break in Belgrade. This is because Belgrade is well connected with the world through airport, rivers, rail stations and highways. Being a regional center and a multimillion city it has much to offer to tourists of various social and financial background. Belgrade, with its cultural, historical and natural variety, along with its nightlife can be interesting for many. Belgrade can provide sites and events for different tourist groups. There are castles, fortresses, music events, restaurants, clubs, sport events..., also there are picnic spots all located near Belgrade that can also be included in tourist offer. Skadarlija with its restaurants and historical background is popular among tourists. Night clubs located on rivers are unique in Europe, and are growing ever popular among foreign tourists. These are all initial points from where the Belgrade tourist offer can be rebuilt. On the other hand, Novi Sad can provide a different holiday all together. Tourist can go on a long walks, pick up between many restaurants, visit museums, galleries, go on a picnic in near villages or visit chardas, restaurants on water with live music. Other towns in Serbia can also be included in city break offer, but their offer is yet to be compound.

Gastronomy tours, if thought out correctly, can be very popular, and also can be divided on several smaller tours. More situated tourists like to discover new tastes on every journey. It can be divided based on regional or food principle. Tour try cuisine in Vojvodina brings tourist great fish and poultry meals, old fashioned sweets and game meats. South region of Serbia is famous by grilled meat and pepper specialties, but it also has

vegetarian dishes. Region of central Serbia is well known by skewer meat, such as beef, lamb and pork. Mountain cuisine brings meat delicatessen, milk products, dried fruit, mushrooms... Serbia has long tradition is beverage manufacturing, especially alcoholic drinks. Fruit brandies are made from almost every fruit, and among them plum brandy called *sljivovica* is most famous one. *Rakija* tours providing insight in production of brandy, combined with picnic trips and product tasting can be interesting for tourists. Wine tours are very popular today, and Serbia has enough to offer. There are several authentic white and red wines worthy of taste. Winery of Fruška Gora offers wine tasting combined with good food that can be combined with site-seeing and river boat rides. In Eastern Serbia visit to the wine cellars called *pinjnice* can be made. There are also several parishes in central region of Serbia that can be combined for another wine tour. Beside wine and brandy, there are also some other beverage that can be popular such as *medovina*, drink made of honey.

Musical tours, with such brands like *Guča* and *EXIT* and their ever growing popularity, can be one of the most popular segment. *EXIT* and *Guča* can be used for popularization of other music events in Serbia. *EXIT* is a multistage modern music festival that is very popular among young people, and it can be used for popularization of Serbia tourist offer, as well as *Guča*, festival of world and ethno music that is growing more and more popular among foreign tourists. Events such as jazz festivals in Belgrade, Niš, festivals of traditional instruments among others can grow popular if advertised correctly.

Archeological tours, with site-seeing and numerous artifacts, from prehistoric to late 20 century, are yet to be fully discovered from tourists. Serbia is one of few states in the world on whose territory tourist can follow track of human civilization from prehistory to the modern age. *Lepenski vir*, *Vinča*, *Starčevo*, *Hisar* are among oldest sites with traces of beginnings of modern man civilization. Then there are artifacts from greek and roman period, particularly numerous from late roman empire period, with several residential sites. There are several dozen medieval fortresses around Serbia that can be used for tourist needs. Places, that famous battles took place at, are popular among visitors, so there

is yet another niche that can be used. With interesting programs attached to these sites it will be possible to increase interest for archaeological sites in Serbia.

MICE tourism can represent an advantage of Serbian tourism, if designed correctly. This niche of tourism represents events where top class experts from their expertise summit in order to accomplish new standards. It would be in Serbia's benefit to organize such an event. It would be even better to find something that Serbia has or can improve with her knowhow, that can be topic of such an event.

Educational tourism can also be a significant part of Serbian offer, due to the fact that some of the best scientist work on Belgrade university. What this means is that Serbia must increase number of summer camps, level of student exchange, number and level of top class universities that Belgrade university has cooperation with. Students are among first to discover new destinations.

Medical tourism is a hidden chance, but to make it possible Serbian medical infrastructure must be up-graded. Price of medical service is significantly lower than in other states, so it can be Serbia's advantage.

River cruises on Danube, Sava, Morava and Drina are only some of the possibilities that Serbian rivers provide to the tourists. Danube is navigable through its entire flow in Serbia which opens many opportunities for tourist development. River goes through two capital cities, and can be used for cruise tours or picnic trips. Several main tourist plans were made for use of Danube, but it hasn't made expected outcome yet. One of the most famous European tracks for F1 Powerboat is on estuary of Sava in Danube. River Sava is also navigable in Serbia. On its river banks are ponds, natural heritage sites, both sport and commercial fishing. Drina is famous by its rafting that endures through spring and summer of every year. Natural phenomena, settled beaches, traditional manifestations, natural heritage sites, walking tours, monuments from the past are some of the features that rivers in Serbia have, that are waiting to be included in tourist offer.

Spa tours must be among top offers in Serbian tourism, for diversity of their natural springs, long

tradition, and possibilities of touring that environment of Serbian spa provides. Spa tradition in this part of the world spreads back to Roman times. Some of spas have several centuries long uninterrupted tradition. There are centers for diversity of medical issues, but also places of rest and fun. Vrnjačka and Niška spas are famous for night life, other, like Gornja Trepča and Prolom for peaceful surrounding. There are a couple of dozen spas in Serbia that can be included in tourist offer. Good medical care, food and drink, manifestations, possibility of excursions are some of advantages that spas in Serbia possess.

Old railways tours provide traveling and site-seeing from past times. Šarganska osmica and trip to Sremski Karlovci are two of several tours with old fashioned trains that tourist can take in Serbia. Tour includes traveling with steam locomotive and wooden wagons through wild landscapes and organic food meals.

Holly places in Serbia are also notable tourist destinations that can be designed into very interesting tours for tourists. Several groups of monastery are called Serbian Athos. In Ibar valley nearly ten monasteries are located near to each other. Monasteries on Fruška gora are of great significance for Serbian history. Some of the monasteries are on UNESCO world heritage list. There are also traces of pagan temples, Roman and Greek holly places, early Christian basilicas, Islamic and Jewish temples and many others. In Orthodox monastery tours with meals and wine tasting are available.

Cultural tourism is mostly underestimated part of Serbian offer which will be much more noticeable with proper advertisement. Museums, galleries, legacies, memorial collections can be found in every part of Serbia. Tombstones called Stećci and kraljevaši are specificity of Serbian burial traditions. There is also great variety of intangible heritage that can be interesting for foreign tourists. Cultural manifestations dedicated to music, poetry, history among others, can provide memorable tours for tourists all year long.

Salaš tours can become distinctive trademark of Serbian tourism, with full-filled day programs including both rural and urban experiences. They represent unique life style from past ages. For tourist it would be an opportunity to experience way of life from past ages. Accommodation,

service, food and drinks, music, every aspect of tourist offer made in a hundred or more year old fashion. Most salaš are located in Vojvodina, so the offer can be combined with other parts of Vojvodina tourism. Combined they can bring new possibility for breakthrough of Vojvodina tourism. Visiting heritage sites, wineries, traditional manifestations, local food and beverage manufactures, riding horse sleigh and carriages, visiting kennels along with evenings at chardas are only some of the possibilities that Salaš tours provide.

Visiting villages provides insight in way of life in Serbian rural environment. With number of ethno houses and villages that already have established themselves among tourists and just a little more diversification in their offer, this will become one of star products of Serbia tourist offer.

Fishing tourism is recovering after several decades of stagnation, but with revitalization of fishing facilities and better control, this part of Serbian tourism can prove itself profitable. Fishing can be participated on rivers, lakes and other stagnant water, but also on channels and artificial lakes. Tourist can choose between couple of dozens fishing spots in all parts of Serbia, such as Danube, Sava, Morava, smaller rivers are mainly restocked too that can fish on Silver lake, Palić, or choose some of the channel spots for sport fishing. Fishing for catfish can represent top offer for tourists.

Hunting tourism can be respectable part of tourism industry, but there has to be more investments in hunting-grounds. Serbia hunting-grounds can offer game, quarry and fowling hunting. Because of the fact that hunting-grounds in Serbia were neglected in past twenty of thirty years there aren't much of trophy prey, but state in improving. Hunt on wild boar is most representing in Serbia. Some of the famous hunting-grounds in Serbia are Mali Jastrebac, Sokolovica, Vratna, Rit, Plavna and Karadjordjevo.

Agritourism is already very popular among tourists in Serbia because there are many ethnic households that provide tourists with possibility of inclusion in farm life. Tourist can learn to make winter stories, jams, dairy products, juices, or even go on to collect mushrooms and herbs. They can also learn recipes for Serbian traditional dishes.

With significant number of wild rivers, canyons, peaks Serbia can be very attractive for extreme tourism. Conquest of unexplored canyons is popular amongst younger population and Serbia has couple of dozen canyons that fits this description. Canyons such as Jerma, Lazarev, Tribuće, Zvijezda and Dubrasnica are some of the most extreme in Europe, with numerous waterfalls, caves and rapids, impassable without hiking equipment represent a challenge for every extreme sport lover. Rapids on river Ibar are the best kayak on wild water track in Europe. There are also several other tracks on smaller rivers. Several walking tracks through wild nature are marked providing not only site-seeing but also visiting remote villages of Serbia. Mountains are numerous in Serbia and some of them have peaks that will represent a challenge for every mountaineer.

Winter tourism, with only a couple of winter centers, is not yet very well developed, but with careful guidance, it will become respectful part of tourism in Serbia. Kopaonik and Zlatibor are well known in this region of the world, while Stara Planina, Tara and Divčibare are known mainly to domestic tourists. Plateau of Pešter can be used for winter walking and sledge rides. There is also a ski center Bjelasica on Šar planina, but because of the current political situation, it is unusable. There are many problems of winter tourism in Serbia, connection with cities, accommodation, number and quality of ski tracks, unmarked walk paths, to mention some. Serbia winter centers are better known by their night life rather than winter facilities. Serbian winter resorts are no match to Austrian or Suisse centers but with right planning, it can find place on world map of winter destinations. Plateau of Pešter can be used for winter walking and sledge rides.

There are also several other niches in Serbian tourist offer, such as canyoning, speleology tours, bird watching and others that can be taken in consideration. Also, in Serbia exists people with new ideas for tourist offer in this part of the world, like dogsled tours and truffle finding tours. Offer exists, but it must be planned in order to support Serbia effort to regain her place on tourist map of today.

4. PROBLEMS OF TOURISM IN SERBIA

Tourism in Serbia faces many problems, but main ones are segmentation, because tourist offer is segmented but it is not very well classified, Serbian tourism lacks global recognition, Serbia isn't on the top places in tourism statistic, and the biggest problem is state support.

Serbia is not recognized as relevant partner from big world operators such as TUI Travel and Thomas Cook group. These companies work with agencies, hotels and other tourist facilities around the world giving services to millions of tourists, earning billions of dollars. If Serbia succeeds to cooperate with one or several of global tour operators, and manages to put her offer in their catalogs, tourism in Serbia will have much more chances to revitalize.

Lack of infrastructure is possibly the biggest problem, because great investments are necessary to improve the state in Serbian infrastructure. Railways, regional, state and local roads, as well as air and river ports need to be built or reconstructed. Highway in Serbia is yet to be built. Existing highway is bad, unsafe, poorly marked, badly directed, doesn't have sufficient auxiliary units, signalization is inadequate and gas stations and resting spots are few and wrongly distributed. Railways are in worst shape of all infrastructural facilities in Serbia. Railway roads are absolute, trains old, service beyond every level, delays are enormous and growing and station ruined. If railways don't get large investments in near future, tourists will have to find another way to get to Serbia. River ports are mainly industrial, even so there are only few. Only one that receives cruise ships in Belgrade port. Other river cities in Serbia are invisible for tourist cruisers. Knowing that Serbia has several hundred waterways, this is a discouraging fact. Novi Sad, Smederevo, Niš, Kladovo, Šabac, even Zemun doesn't have proper docking for tourist ships, and the one in Belgrade was built for different purposes all together. Airports are in best shape of all infrastructure facilities in the country, but far from ideal. Airport in Belgrade in rather confusing and level of service is very bad, utility rooms are insufficient and taxi service is expensive and under average. Niš airport is not fully developed yet. Airports for sport flights are few and badly

connected with main roads. There should be minor airports for purposes of private flights and taxi services. In this purpose some of former military airfields can be rebuilt.

Tourist facilities are insufficient, under average, and overcome. Many hotels don't fulfill modern standards, number of hostels must be bigger, and it seems as large percent of them is not connected with tourist association in Serbia or in the world. Most of hotels in Serbia are couple of decades old, they lack to fulfill modern demand, their number is problematic, and their level of services must be improved. Hotels with five stars and resorts aren't many and there are located mainly in Belgrade and winter centers. Categorization of hotels in Serbia is problematic and their connection with tourist organization appears to be bad. Hostels are better situated but they lack in number. Other facilities are mainly invisible for tourists from other countries.

Profile of people working in tourist and utility sector in Serbia is also problematic. For many of them this is only temporary job and they are not trained for customer service. Structure of tourist agencies operating in Serbia is unsatisfactory, their offer is obsolete and undiversified. Agencies are not connected with global tour operators. They don't have diversified offer for local events or tours. Most of the staff in utility services speaks one or none foreign language. City tourist organizations are not visible in a way that tourist industry requires.

There are many stereotypes about Serbia, thanks to recent political events, war, instability of Serbian region, human rights threatening, social and economy problems, that make Serbia less desirable tourist destination.

5. POSSIBLE SOLUTIONS

Tourist offer of Serbia is presented badly in mass media. There should be commercials in length of fifteen and thirty seconds and one minute, with top tourist offer from Serbia on carefully selected programs. Top television channels don't have any commercial concerning Serbian tourism. Specialized channels such as Travel channel don't broadcast commercials and travelogues about Serbia. Concerning the fact that Serbia is well-known by athletes, maybe sport channels

such as Eurosport or even ESPN would be a spot to start campaign. Advertisement should contain well known places and events from Serbia that some of the viewers are already familiar with. Sites about Serbian tourist offer are interminable, often confusing, rarely updated and not very custom-caring. There are easy enough to find but it isn't very easy to find the needed offer on them. There aren't many banners and pop-ups with Serbian tourist offer on other sites concerning Serbia. In the time of social networks it is defeating to see the state of Serbian tourist presence on them.

There aren't any stands on main arrival places in Serbia. On airports there should be leaflets on the way out of the plains and around customs area, on railway and buss stations also. Festivals and traditional manifestation visited from tourists should advertise Serbian tourist offer as well.

Tourist organizations in cities should be more visible, they should approach tourists instead of waiting on them to find them. They have to have more diversified offer, more up to standard stands and objects put on center spots in the city.

Hotels are invisible on global market, they are not connected with global operators, top booking sites, and they don't seem to have solo booking offer for tourists. Tourist agencies, on other hand, are concentrated on domestic tourism.

CONCLUSIONS

Serbia confronts many obstacles in her effort to become recognizable tourist destination. Problems are many, but solvable. Image of the country needs to be improved. Investment in infrastructure and tourist facilities must be made, because it is the foundation whit out which the goal of making Serbia a developed tourist country is elusive. Segmentation of Serbian tourist offer, in accordance whit modern tourist demand, is also needed. In order to achieve these goals, every relevant part of Serbian tourist industry needs to take part in process of reinventing of Serbian tourism. Finding right vision, and making sustainable strategy, will enable Serbia to, developing correct marketing plan, make her mark on world tourist map.

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SUSTAINABLE DEVELOPMENT PLANNING – THE CASE OF MACEDONIA –

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Abstract

*To meet the challenges of sustainable development, strategic planning practices need to become more effective, efficient, credible and lasting. A sustainable development strategy is a tool for informed decision-making that provides a framework for systematic thought across sectors and territory. Following the recommendations of the UN World Summit on Sustainable Development in Johannesburg 2002, Macedonia developed a national strategy for sustainable development, for the period 2009-2030. The proposal for the overall strategy comprises of two main parts: (1) **long-term, intermediate and short-term objectives**, which timely address the important issue of EU accession as well as making the Republic of Macedonia sustainable, and (2) **seven strategic thrusts**, which address what to focus on in order to make the Republic of Macedonia sustainable.*

However, what is still missing is complex methodological and analytical framework for sustainable development analysis (Social Accounting Matrix, SESAME approach, NAMEA approach). Hence, one should point to the fact that sustainable development and sustainable development planning are complementary processes which should ultimately lead to increased well-being of the mankind.

Keywords: *planning, sustainable development, strategy, methodology, Macedonia*

1 INTRODUCTION

The Rio Summit established sustainable development as the guiding vision for the development efforts of all countries. At Rio, and in later commitments, all governments undertook to establish and implement national sustainable development strategies. The strategies for

sustainable development, called for at Rio, are foreseen as highly participatory instruments intended “to ensure socially responsible economic development while protecting the resource base and the environment for the benefit of future generations”. (OECD, 2001)

In simple terms, sustainable development means integrating the economic, social and environmental objectives of society, in order to maximize human well-being in the present, without compromising the ability of future generations to meet their needs. Sustainable development constitutes a set of short, medium

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and long term actions, activities and practices that aim to deal with immediate concerns, while at the same time address long-term issues. Achieving sustainable development requires far reaching policy and institutional reforms and the involvement of all sectors, at all levels.

The achievement of sustainability in national development requires a strategic approach, which is both *long-term* in its perspective and *integrated* or “joined-up” in linking various development processes so that they are as sophisticated as the challenges are complex. A strategic approach at the national level implies:

- linking long-term vision to medium-term targets and short-term action;
- “horizontal” linkages across sectors, so that there is a coordinated approach to development;
- “vertical” spatial linkages, so that local, national and global policy, development efforts and
- governance are all mutually supportive; and
- genuine partnership between government, business, trade unions, and community organizations.

2 PLANNING SUSTAINABLE DEVELOPMENT

The introduction of sustainable development raises difficult management challenges, because the concept is multi-faceted and broadly-defined. These challenges, however, are not unique. Governments and corporations have faced them before when they have integrated new values into their policies and organizations (e.g., gender equity, occupational health and safety, results-based management). The success of this integration is typically a function of process aspects, such as leadership, planning, implementation, and monitoring and review.

Planning of policies, programs and projects (identifying the means of achieving objectives - institutional mechanisms, programmatic structures and specific policy initiatives) is a part of the strategic management cycle that governments have the most experience with. Some of the characteristics of this process include:

- strong institution or group of institutions heading the process;
- linking national, regional and local levels;
- comprehensive and reliable analysis;
- coherence between budgets and strategy priorities;
- building on existing mechanisms and strategies, and on existing knowledge and expertise;
- develop and build on existing capacity; and
- effective participation. (International Institute for Sustainable Development, 2004)

Sustainable development planning is an aspect of strategic management that countries have significant experience with and are quite good at. However, for the national SD strategy process key challenges remain in a number of areas as evidenced by the country research, including:

- Establishing a clear legal mandate for the process;
- Thinking strategically about the institutional arrangement for the strategy process; and
- Assessing specific policy initiatives using an economic, social, and environmental lens.

2.1 What is a strategy for sustainable development?

To meet the challenges of sustainable development, strategic planning practices need to become more effective, efficient, credible and lasting. There is a need to restructure existing processes, institutional arrangements and procedures according to individual countries’ own needs, priorities and resources. Therefore, a strategy for sustainable development should comprise: “a coordinated set of participatory and continuously improving processes of analysis, debate, capacity-strengthening, planning and investment, which seeks to integrate the short and long term economic, social and environmental objectives of society – through mutually supportive approaches wherever possible –and manages trade-offs where this is not possible.” (OECD, 2001)

A sustainable development strategy is defined as a coordinated, participatory and iterative process of thoughts and actions to achieve economic, environmental and social objectives in a balanced

and integrated manner, at the national and local levels. The process encompasses situation analysis, formulation of policies and action plans, implementation, monitoring and regular review. It is a cyclical and interactive process of planning, participation and action in which the emphasis is on managing progress towards sustainability goals rather than producing a "plan" as an end product

A sustainable development strategy is a tool for informed decision-making that provides a framework for systematic thought across sectors and territory. It also helps to institutionalize processes for consultation, negotiation, mediation and consensus building on priority societal issues where interests differ. A sustainable development strategy could empower a country to address inter-related social and economic problems by helping them to build capacities, develop procedures and legislative frameworks; allocate limited resources rationally and present timetables for actions. (UNDESA, 2002)

As a result, strategies for sustainable development should, to the extent possible, be based on visions that define desirable ends, as well as feasible ways to achieve those ends. In the case of sustainable development, this means:

- i. clarifying what needs to be sustained, and what needs to be developed; and
- ii. eliciting paths that allow such a vision to happen, while keeping within the bounds imposed by natural systems. It is clear that there is no universal agreement on either of those points.(UNDESA 2012)

3 NATIONAL SUSTAINABLE DEVELOPMENT STRATEGY FOR MACEDONIA

Sustainable development is an ongoing process that involves improving the integration of environmental, economic and social considerations. Population should enjoy and contribute to a good framework for employment, living conditions, social conditions, and quality of life. Sustainable development implies that society must face up to economic, environmental and social challenges simultaneously. Future generations should have, at least, as favourable

opportunities for a good life as present generations, and a sound socially-balanced economic development must be ensured. This development must provide for greater individual freedom of action, must display respect for the limits of nature and the environment, and have no negative impacts on people's health.

Republic of Macedonia has identified several key priorities for its future development, where achieving EU membership can be considered as the overriding strategic policy objective. Republic of Macedonia was granted applicant status in May 2004 and candidate status in December 2005. The European Partnership concluded in June 2004 provided main priority areas for further integration into the European Union and the development of a National Strategy for Sustainable Development (NSSD) has been identified as a short-term priority. The NSSD should be a plan for the implementation of the recommendations set out in the conclusions of the UN World Summit on Sustainable Development in Johannesburg 2002. (Ministry of Environment and Physical Planning, 2009)

3.1 Political context

The ANALYTICAL REPORT for the Opinion on the application from the Republic of Macedonia for EU membership (COM 2005) highlighted the need of a National Strategy for Sustainable Development. The Ministry of Environment and Physical Planning has undertaken many activities for promoting sustainable development in general and for the furthering of the National Strategy for Sustainable Development. It has:

- organised workshops for governmental, municipality, academia and NGO representatives;
- financed the development of the "Conceptual Approach towards Creation and Implementation of the National Strategy for Sustainable Development of RM" (2000);
- co-ordinated the preparation of the "National Assessment Report for Sustainable Development" (2001-2002), which was adopted by Government in July 2002 (with this document, the Republic of Macedonia participated in the World Summit on

Sustainable Development in Johannesburg in 2002);

- commenced the implementation of the activities aimed at developing the "Research Concept supportive to the creation and implementation of the National Strategy for Sustainable Development of The Republic Of Macedonia", 2003;
- co-ordinated the national reports to the NCSD sessions;
- translated and published relevant international documents on sustainable development; and
- financed the development of the "Guide towards Local Agenda 21" (a guide towards the development of strategies and action plans for sustainable development at local level).

For undertaking these activities, MoEPP was given a mandate from Government in the form of governmental conclusions and decisions, of which the following are particularly relevant:

- The MoEPP, as national focal point, shall proceed with the co-ordination of the activities related to the implementation of the goals and recommendations of Agenda 21 and development of National Assessment Report of Sustainable Development" (2001);
- The Government has obliged the MoEPP to initiate, after the completion of the "Research Concept for Provision of Analytical and Prognostic Substance to Serve the Purposes of the Development of the National Strategy for Sustainable Development of the Republic of Macedonia", preparatory activities for development of the National Strategy for Sustainable Development of the Republic of Macedonia " (2002); and
- The Government has appointed the MoEPP to be co-ordinator of activities for development of the National Strategy for Sustainable Development of the Republic of Macedonia (2004).

All this demonstrates that the NSSD project was well founded in the political record of the country. (Ministry of Environment and Physical Planning, 2009)

3.2 Project Concept

This Project was not an *implementation project*, but a *support project*, the main aim of which is to structure, program, and monitor and manage a strategic and participatory process in the Republic of Macedonia, in relation to preparing a viable and affordable national strategy for sustainable development. In this context, the *driving engine* of the Project were the national specialists with their connected Sector Working Groups (SWG) and Cross-cutting Support Units (CCSU).

The strategic process was based on a participatory approach. The driving engine of the process is a selected group of highly accomplished national specialists, who each covered a sector or issues cutting across more sectors. They were the foundation stone of the entire process and they were at the center of the changes achieved throughout the process.

The basic fundament for the whole strategy development process were 11 cross-cutting sector analysis and assessment reports (AAR). They have been prepared by the national specialists. In order to achieve a more focused strategic orientation, the 11 Analysis and Assessment Reports – covering 4 Cross-cutting Support Units and 7 Sector Working Groups – have been merged into the following six main issue areas. They constituted the strategic structure on which the NSSD was built:

1. Policy and Legal Framework (cross-cutting)
2. Environment (cross-cutting)
3. Energy (cross-cutting)
4. Rural Development (includes agriculture, forestry, and tourism)
5. Social Issues (includes employment, social care, health, and education)
6. SMiLES (including Small – and Medium-sized enterprises (SMEs), Infrastructure, Transport, and Industry)

The 11 Analysis and Assessment Reports have been consolidated into a **Sustainable Development Framework Report**, which included the following main parts:

- The *Knowledge Platform*, especially in terms of the consolidated findings and the

consolidated conclusions from the 11 Analysis and Assessment Reports, structured in accordance with the above six main issue areas.

- The *Enabling Environment*, addressing the need for trust in the future, political willingness and capacity, legal and regulatory instruments, and an investment climate.
- The *Implementation Capacity*, addressing the technical and professional capacity, the institutional and organizational capacity, and the investment and funding capacity.

The 11 *Analysis and Assessment Reports* and the *Sustainable Development Framework Report* have been consolidated into the *NSSD*. The role of the National Specialists and their Core Working Groups and Wider Working Groups is recognized as **the professional nucleus and driving engine of the Project**. (Ministry of Environment and Physical Planning, 2009)

3.3 Project Objectives

Strategic Objective

Sustainable development in the Republic of Macedonia, encompassing the economic, social and environmental dimensions

Project Objective

To lead a participatory process of developing a National Strategy for Sustainable Development, meeting the requirements of EU-accession for the Republic of Macedonia

Outputs

Specific Project Objective Area 1 - Awareness Increased

Output 1: Awareness of sustainable development among the stakeholders and the people of the Republic of Macedonia increased

Specific Project Objective Area 2 – NSSD Prepared

Output 2: Framework for sustainable development in the Republic of Macedonia as ground for acceleration of domestic and foreign investments defined

Output 3: Strengths of the Republic of Macedonia to fully participate in the process of globalization identified.

Output 4: National Strategy for Sustainable Development in compliance with EU-requirements elaborated

Specific Project Objective Area 3 - Capacity Increased

Output 5: Capacity for planning and management of sustainable development among key stakeholders strengthened

Output 6: Institutional setup and coordinating mechanisms for implementation and maintenance of the process of sustainable development established

(Ministry of Environment and Physical Planning, 2009)

3.4 Project results

With the aim of making the *NSSD* as viable as possible, it builds on the following three mutual supporting guiding principles:

- **Guiding Principle No. 1:** The Government should function in an **innovative supporting and guiding role** in relation to the municipalities and the private sector, which has the operational role in relation to making the Republic of Macedonia sustainable.
- **Guiding Principle No. 2: E-government** should be introduced, covering national as well as regional and local government, in order to ensure transparency and efficiency, and as a strong tool in relation to faster and more effective processing of sustainable development projects, from the public as well as from the private sector.
- **Guiding Principle No. 3:** Focus in the short term should be on projects and activities, which **target the well educated work force**, in order to avoid further brain drain, and to possibly attract Macedonians abroad who are highly skilled, well educated and highly prospective.

The overall strategy comprised of two main parts:

- **Long-term, Intermediate and Short-term objectives**, which timely address the important issue of EU accession as well as making the Republic of Macedonia sustainable.

- **Seven Strategic Thrusts**, which based on the three guiding principles, in three prioritised and time bound levels address what to focus on in order to make the Republic of Macedonia sustainable. They should cover the three main pillars: economic, social and environmental sustainability.

The 1st level (from 2008 to 2010), with the heading **Focus**, should be the booster and starter of the SD development process by focusing on the important EU accession, the importance of ensuring understanding and commitment, and last but not least e-government as the starting key instrument for ensuring transparency and efficiency, and thus support the processing of SD projects should be implemented.

The 2nd level (from 2010 to 2015), with the heading **Mature**, addresses the important issue of maturing the public, economic and private sector for SD. This has already been identified as one of the key constraints for SD in the Republic of Macedonia. Consequently, this SD streamlining of the said sectors is a basic precondition for making the Republic of Macedonia sustainable through projects and activities. Pilot and demonstration projects are selected and implemented at this level too.

The 3rd Level (from 2015 to 2030), with the heading **Implement**, addresses a more comprehensive selection and implementation of pilot and demonstration projects based on lessons learned from the implementation of pilot and demonstration projects in the 1st and 2nd Level. This should be one of the major implementation and guidance tools of the Government in relation to the municipalities and the private sector.

In the same time, **seven strategic thrusts** were proposed, which should take advantage of the potentials in the country and overcome the constraints to achieve the overall objectives of the strategy. The main idea was to prepare and mature the Republic of Macedonia for sustainable development as a basic precondition for actually implementing SD actions and projects. In this context the seven strategic thrusts address:

1. The important issue of ensuring EU accession
2. Raising awareness and commitment to sustainable development covering all walks of life in the Republic of Macedonia

3. Introduction of E-government as the key SD implementation tools and as the key booster of the commercial process
4. Streamlining the public sector through organizational development and institutional strengthening based on the concepts and principles of SD, including cross-cutting and integrated strategic and participatory work
5. Streamlining the banking, funding and financial infrastructure in the same context, so that investment and running costs are readily available for SD projects and activities
6. Streamlining the private sector so that the private sector is developing based on SD principles, and that engineering, construction and other supporting private companies have the capacity to plan, design and implement/construct projects and activities based on the principles of SD
7. Identifying a number of demonstration and pilot projects early on during implementation of the NSSD. These should be used as practical demonstration of costs and benefits of SD based development. (Ministry of Environment and Physical Planning, 2009)

3.5 NSSD Implementation framework

The first step in making the Republic of Macedonia sustainable was to set up a **National Council for Sustainable Development (NCSD)**, with a resourceful, competent, and efficient Secretariat, which in time could develop into a proper Agency for Sustainable Development. This secretariat should be provided with governmental executive power, and in line with this it is proposed that the NCSD should be chaired by the Prime Minister, and should include all relevant ministries and other relevant stakeholders in the society.

The **Agency for Sustainable Development** could be established through merging and further development of existing agencies as the Agency for Spatial Planning, the Agency for Promotion of Entrepreneurship, the Agency for Energy Efficiency, the Agency for Sport and Youth and other agencies addressing and dealing with sustainable development.

The first task of the NCSD should be to carefully review this final draft NSSD and thus make

directions for its revision, detailing, finalization and implementation. In this connection it is important to underline the dynamic concept behind this NSSD, which entails that it should be continuously assessed and respond to changes, through the preparation of **annual national strategic working plans** by the NCSD with point of departure in this NSSD. (Ministry of Environment and Physical Planning, 2009)

4 The need for developing a proper methodology

In order to better understand the sustainable development concept, one has to develop an appropriate methodological instrument. In parallel with the introduction of the sustainable development concept, the SNA 1993 introduced (and SNA 2008 further developed) the Social Accounting Matrix (where later its extensions, the SESAME and NAMEA approaches, have been developed) as a methodological basis for the sustainable development analysis. Therefore, it is necessary the effort of the scientists and experts in our country to be focused on preparation of a complex analytical framework, consisting of:

- Preparation of a highly disaggregated Social Accounting Matrix (SAM)
- Preparation of a SAM extended with social indicators (SESAME approach)
- Preparation of a SAM extended with environmental indicators (NAMEA approach)

4.1 Social Accounting Matrix (SAM) for the Republic of Macedonia

At the moment, there is no Social Accounting Matrix (SAM) for the Republic of Macedonia. But, there is time series data with a set of sectoral accounts (from the production to the capital account, for five domestic institutional sectors and rest of the world sector), as well as, a high quality time series data for the national accounts. Hence, it is due time the State Statistical Office, together with the relevant ministries in the Government and experts from the scientific and educational institutions in Macedonia, as well as with institutions and experts from the developed market economies, to start the preparation and construction of a highly disaggregated SAM for the

Republic of Macedonia. The SAM for the Republic of Macedonia would mainly have two basic tasks:

- a) to enable presentation of information about the economic and social structure of the national economy; and
- b) to provide analytical and accounting framework as a basis for construction of macroeconomic models for analyzing the national economy and the effects from the implementation of the macroeconomic and development policy measures.

A principle objective of compiling a SAM is, therefore, to reflect various interdependencies in the socioeconomic system as a whole, by recording the actual and imputed transactions and transfers between various agents in the system. Hence, couple of activities are of significant importance for Macedonia:

- creation, harmonization and implementation of an integrated analytic-accounting framework as a basis for planning, programming and decision-making of the future sustainable development, based on the United Nations SNA and harmonized with the system and methodology for planning, analyses and decision-making in the developed market economies;
- affirmation of the role and the importance of the SNA and the SAM for the methodology for preparation, adjustment and implementation of the macroeconomic and development policy and planning documents in the national economy;
- construction of a SAM for the Republic of Macedonia, based on a comparative analysis of the SAM construction and implementation experiences in the developed market and transition economies (Kjosev, 2012).

4.2 SESAME (System of Economic and Social Accounting matrices and Extensions) for the Republic of Macedonia

It is fair to say that unemployment in Macedonia is one of the gravest and most difficult economic, social and political problems. This ongoing situation imposes a real necessity for the

SESAME approach implementation in the Republic of Macedonia. The above mentioned is made possible through the main socio-demographic module of the SESAME approach. The main goal of this module is to present the interaction between the economic and demographic changes in the national economy, including the quantitative and qualitative changes of the potential labor force, as well as those changes influencing the consumption (ex.: the population age structure). This data can serve for the analysis of the impact of the demographic changes on the income distribution.

Republic of Macedonia, in our opinion, can use the socio-demographic module from the SESAME approach, by preparing several tables, using the international standards and classifications, as adopted and implemented by the State Statistical Office of the country (SNA 1993 and 2008, ESA 1995, etc.). The socio-demographic module can reveal numerous socio-economic trends existing in the Republic of Macedonia: population growth rates, average number of household members, the relation between the size of the household and its welfare, the urbanization processes, the process of decreasing size of the agricultural households, number of households depending on income transfers, the participation of women and men in the labor force, the labor force educational level, educational levels differences between the rich and the poor, etc. (Kjosev, 2012).

4.3 NAMEA (National Accounting Matrix including Environmental Accounts) for the Republic of Macedonia

Republic of Macedonia recognizes environmental protection and sustainable development as priorities both in their own right and as an essential part of the process leading to EU accession. Environmental protection is one of the basic and priority values stated in the Constitution of the Republic of Macedonia. The establishment of the Ministry of environment and physical planning contributed to institutional capacity building of the country in the field of environmental policy creation and implementation. Recently, the Ministry of environment and physical planning has established the **Macedonian Environmental**

Information Center (MACE), as its organizational unit. It supports:

- the process of policy creation, planning and decision making;
- identifying effective measures for protecting and promoting the environment;
- on-time and reliable information for the public about the condition of the environment and active participation of the public in the environmental protection; and
- fulfillment of the requirements and the obligations for informing the national and international organizations and institutions.

Therefore, the national environmental information system is an electronic system for environmental data collection and management. It provides optimized flow of data between relevant institutions and integration of all data into a single operational structure. Hence, environmental indicators, provided by this Centre, are useful tool in the process of environmental reporting. The data base already created by the MACE will be a solid foundation for the preparation and implementation of the NAMEA approach in the Republic of Macedonia. Through such designed NAMEA approach for the Republic of Macedonia, one will connect data from the System of national accounts (SNA) and the environmental data in a systematic way (by applying uniform and standard definitions and classifications) and will enable to describe (in physical terms) the quantitative impact of the economic activities on the environment. Moreover, the NAMEA approach for the Republic of Macedonia will be a solid analytical database for preparation and implementation of macroeconomic models for analyzing the environment protection policies and activities. (Kjosev, 2012)

5 CONCLUSION

The National Strategy for Sustainable Development of the Republic of Macedonia should ensure broad consent and a firm anchoring in all walks of life in the country. Therefore, it is decisively important that comprehensive and in-depth **sounding and hearing periods** are planned, programmed and implemented based on an interactive and participatory approach, which

should involve as many stakeholders as possible such as citizens, public and private organizations, institutions, companies, and educational, research, and development institutions.

Sustainable development and sustainable development planning are complementary processes which should ultimately lead to increased well-being of the mankind. In order to better understand and implement the whole process, one should take into consideration their methodological basis, their preparation and implementation. Hence, it is of urgent matter that Macedonia develops the Social Accounting Matrix and its extension (SESAME and NAMEA), which will be used for the decision-making process related to creation and implementation of efficient

macroeconomic and development policies in the country.

All abovementioned shows that development planning and the market are complementary mechanisms in the developed market economies, and as such should be equally the part of the new socio-economic system of the Republic of Macedonia. The successful combination of the “market's invisible hand” and the “plan's visible hand” will provide a more rational utilization of the production factors and more dynamic economic development of the national economy. This will lead to a continuous improvement of the economic policy instruments, as well as the other types of planning and programming of the national economy sustainable development.

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ENERGY EFFICIENCY AS A SUSTAINABLE MANAGEMENT CHALLENGE - CASE OF SERBIA -

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Abstract

Based on the current Serbian Energy Strategy, energy efficiency (EE) has been recognized as the second priority of the economical use of quality energy products. Companies in Serbia predominantly use electricity, the most energy inefficient and expensive form of heat generation, so overspending is the consequence, resources are drained, and pollution increases. The level of importance and implementation of EE management among Serbian small and medium enterprises (SMEs) was a topic of survey conducted in December 2012. The participants rated the general level of awareness of rational energy consumption in Serbia as very low among SMEs. It is also considered that the State and the media are not making enough effort to inform the public about the importance of rational energy consumption. Regarding advisory assistance in the domain of EE the general view is that SMEs in Serbia need advisory assistance in the area of improving EE, both in legislation and administration, and in technical solutions and financing issues. Several recommendations are proposed as a means to providing more implementation of EE measures in companies in Serbia.

Keywords: energy efficiency, sustainable management, energy management, EU energy strategy, SME competitiveness, energy advisor

1 SUSTAINABLE DEVELOPMENT AS AN OVERALL ECONOMIC AND SOCIAL POLICY IN SOUTH EAST EUROPE

Modern organizational studies have moved on from the earlier concept of disassociation from the

natural environment and its implications. Attention to non-human nature was absent from the strategic management literature and confined to the field of business. Topics of sustainable development, climate change, ecosystems and biodiversity were nonexistent in leading management journals until the early 90's. Management of sustainable development is now one of the crucial segments of management theory and practice. It is the key principle on

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which countries base their economic and social development and therefore it is not a surprise that some authors have included sustainability development as one of the global megatrends and, like other megatrends, they present inexorable strategic roadmaps for corporate leaders (Lubin, 2010).

The countries making up the region of South East Europe and Serbia have all included the management of sustainable development as a formative element of their overall economic development. The development strategy of Bosnia and Hercegovina stipulates five priorities among which are Sustainable Development (Vijeće ministara BiH, 2010). Bosnia and Hercegovina focuses on agriculture and food production, energy, environment, transport and communication. Croatia, an EU member since 2013 has harmonized its regulation with the EU requirements, and created the Strategy of sustainable development in 2009, but it is also a formative element of other strategies like the Strategy of tourism development and the Strategy of regional development. Montenegro has a separate ministry dedicated to this sole purpose: the Ministry for Sustainable Development and it shows a strong policy intention to make Sustainable Development a key driver for its economy and the environment.

Serbia has ratified the United Nations Framework Convention on Climate Change and the Kyoto Protocol. It has established a Government Office for Sustainable Development for Underdeveloped Areas, and has enacted a special Law on Government which adapted an Action plan on Natural Strategy of Sustainable Development 2009-2017, in which sustainable economy and industry are the first priority.

2 THE ROLE OF ENERGY AND ENERGY EFFICIENCY IN SUSTAINABLE MANAGEMENT

Since approximately 1850, the global use of fossil fuels has increased and dominates energy supply, leading to a rapid growth in CO₂ emissions. The contributions of individual anthropogenic GHGs to total emissions in 2004, expressed as CO₂equivalent were greatest from fossil fuels (56.6%), deforestation and decay of biomass (17.3%) and methane (14.3%). (IPCC, Summary

for Policymakers, 2011) Therefore, out of all the numerous critical factors, it is energy production and consumption that has had the most decisive impact on the sustainability on the global level. In 2007 the European Council adopted ambitious energy and climate change goals for 2020 – to reduce greenhouse gas emissions by 20%, to increase the share of renewable energy to 20% and to make a 20% improvement in EE. The energy strategy of EU rests on the goals proclaimed to be reached in 2020. EE is expected to deliver 20% energy savings by 2020 and 30% to 40% energy savings by 2050. At the current rate of progress, only half of the anticipated 20% energy savings coming from EE will be achieved by 2020. The overall percentage of primary energy consumption savings for the EU-27 in 2010 due to EE measures was 5.44%. This is of great concern as EE is crucial in energy policy in order to achieve international competitiveness and security of supplies, and to avoid further major investments in electricity generation. (Heffner, 2012)

In the EU according to Eurostat data, on average the final end use of energy shows three dominant categories: transport (31.7%), households (26.7%) and industry (25.3%). Today, industry accounts for about one-third of total global energy use. The industrial sector is responsible for about 22% of worldwide CO₂ emissions, of which 26% is from the iron and steel industry, 25% from non-metallic minerals and 18% from petrochemicals (Energy Technology Perspectives: Scenarios & Strategies to 2050, International Energy Agency Fact Sheet, Industry).

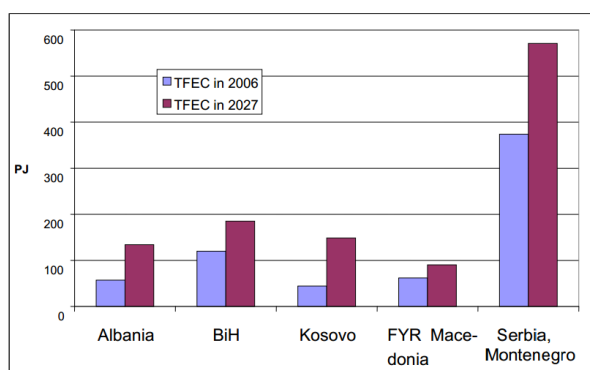
EE is a way of managing and restraining the growth in energy consumption. The International Energy Agency classifies something to be more energy efficient if it delivers more services for the same energy input, or the same services for less energy input (International Energy Agency definition).

The EU Directive 2006/32/EC defines energy efficiency as "a ratio between an output of performance, service, goods or energy, and an input of energy" (Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006). EE offers a powerful and cost-effective tool for achieving a sustainable energy future. It is an instrument for achieving a sustainable future of countries, regions, cities and individual companies and is also the limitless source of renewable energy.

The Introduction of EE management in industry and small and medium size enterprises (SMEs) has and continues to reduce the need for investment in energy infrastructure, cuts energy bills, improves health, increases economic and business competitiveness all by cutting energy costs and improving consumer welfare.

3 ENERGY EFFICIENCY IN SERBIA

Serbia has become a member of Energy Community of South East Europe. The European Commission established the Energy Community in 2005 which included the nine Contracting Parties from South East Europe. One of the tasks of the Energy Community is to organize the relations between the countries and create a legal and economic framework improving the environmental situation in relation to Network Energy and related EE, and fostering the use of renewable energy. The Energy Law (2005) and the Law on Efficient Use of Energy (2012) of Serbia are harmonized with the EU directives. In the scope of the current Serbian Energy Strategy, EE has been recognized as the second priority of the economical use of quality energy products. Its goal is also to increase the EE in all of the segments of the energy lifecycle: production, distribution and utilization by the end user of all energy-related services. Although there is a detailed Energy Sector Development Strategy, the ordinances and regulations required for the implementation of the Energy Law in individual economic sectors are not yet in place.



Source: USAID 2008. Note that the category "transport & other" is not included.

Graph 1 Total final energy consumption projections to 2027 in the Western Balkan region
Source: USAID (2008)

The energy intensity of 1.61 toe/1000\$₂₀₀₀ (calculated as the market exchange ratio) in

Serbia is the second highest in Europe and the third highest calculated as purchasing power parities (Rajaković & Bjelić, 2012). Industry in Serbia uses 34% of final energy consumption. The low energy intensity requires a substantial improvement since many of the measures have not yet been applied. Companies in Serbia predominantly use electricity, the most energy inefficient and expensive form of heat generation.

Buildings supplied with distance heating generally have no heat meters, the heating technology used is often outdated and the thermal insulation of industrial buildings is poor. The thermal energy dissipation can be illustrated by the energy consumption in buildings where Serbia is the top spender solely due to low insulation in residential properties (apartments and houses). The consumption is about 250 kW/m² per year (National Typology of residential Buildings in Serbia, 2012, p. 255); whilst as a benchmark we can note that in Austria it is 120 kW/m² with the aim of reaching 70kW/m². Therefore overspending is the consequence, resources are drained, and pollution increases. It hurts all of the participants in the cycle, and it endangers the competitiveness of the companies. So, it is important to stress that energy management is very much needed as a driver for environmental management and overall operations performance management (Morvay & Gvozdenac, 2008, p. 55).

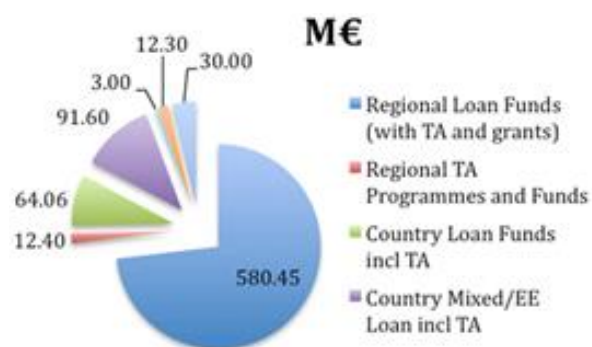
4 THE CHALLENGES OF ENERGY EFFICIENCY MEASURES IMPLEMENTING IN SERBIA

It is not the lack of adequate legal or economic framework which poses the greatest obstacle to management of EE being introduced. The UN Economic Commission for Europe has concluded that two major factors contribute to the lower level implementation of EE management in Serbia and the Western Balkans region: lack of information and more competitive funding schemes (The Energy Series, UN Economic Commission for Europe, Review 37, 2010). Companies are not aware of the opportunities available to harness potential energy efficiencies. Industry lacks knowledge and access to information about ways of reducing its energy consumption, and there are not enough public incentives to encourage more efficient energy use. In depth interviews from

SMEs and EE consultants which follow in this paper illustrate some of the points made here.

Competitive and efficient funding schemes are also missing from the equation. The new Serbian Government Fund for Energy Efficiency (2014) is the first allocated funding scheme solely focused on EE. Local governments lack the necessary resources to invest in EE; therefore they are gradually being introduced to the private public partnership format. Another financing route is the ESCO model, where energy savings of companies and public bodies are achieved with an Energy Service Company (ESCO) and the debt repayment comes from realized energy saving during the contracted period. This type of financing is not completely recognized within the regulatory framework, and this creates another impediment.

Externally funded financing for EE derives mostly from the European Union, International Financial Institutions (IFI) and bilateral donors which provide financing for EE related activities in four different modes, for private and/or public sector clients. The four modes of financing are: regional or country specific IFI loans, or credit lines to local banks, often with grants or subsidies (up to 20% of the investment cost), and with technical assistance (TA) provided to local banks and borrowers (EBRD, EIB, KfW, GGF, WB, EC); regional technical assistance funds generally provided by bilateral donors (USAID, SIDA, GIZ) to assist governments with policy developments and small demonstration projects; country grant funds which aim to promote EE investments and country guarantee funds (by donors) which are combined with loans from local banks.



Graph 2 Available financing by type of fund
Source: Energy Community

The World Bank stocktaking Report on Energy Efficiency (World Bank, A Stocktaking Report, 2010) observed the factors that need to be addressed in order to avoid undercutting the energy saving potential:

1. *Lack of reliable energy data.* It is not viable to gauge estimates for EE potential by country or sector with monitorable and realistic interim targets. Reliable energy consumption data are almost nonexistent in countries throughout the South East Europe region.
2. *Increased energy use in all countries and sectors.* The projections for the South East Europe region show annual growth of more than 3% in energy consumption through 2027. If no measures are taken to improve EE, energy consumption will increase dramatically in the decades ahead.
3. *Multiple barriers to energy efficiency.* The major barriers are low energy prices; cross-subsidies: residential consumers are being cross-subsidized by large industrial/commercial consumers; lack of individual meters or heat cost allocators for heat consumption; substantial commercial losses: theft and high level of non-payment of bills.
4. *Capacity building.* The institutional framework for EE requires substantial improvement.

Capacity building for the implementation of EE programs can be easily strengthened in Serbia by a process known as System of Energy Management. The introduction of energy management begins by adopting a program of energy management, and then developing an Action Plan which sets measurable goals. The Action Plan for energy administration should be publicized. Each plant in the company should have a dedicated coordinator responsible for the local energy management. All members of the energy management team should be appropriately trained and educated to perform their tasks. In addition, they need support for continuously collecting, storing, tracking and analyzing data on energy consumption. The energy administration is responsible for further educational and promotional activities to change behavior and attitudes of employees towards energy consumption in the workplace, and for the "green" public procurement. Environmental and energy practice introduced as everyday practice in companies is faced with many impediments, for

example the lack of awareness of its effects, lack of experienced personnel, limited resources and inadequate organization, just to name a few. (Morvay & Gvozdenac, 2008, p. 147).

There are numerous schemes and standards that companies can use to enhance the triple bottom line. Improvement of environmental performance of organizations, or the EU Eco-Management and Audit Scheme (EMAS) is one of them. Environmental management and audit scheme are not implemented in Serbia (Kostić, 2012). It is a management instrument developed by the European Commission for companies and other organizations to evaluate, report, and improve their environmental performance.

5 SURVEY ON THE IMPORTANCE OF ADVANCING EE IN SME SECTOR IN SERBIA

The level of importance and implementation of EE management among Serbian small and medium enterprises (SMEs) was a topic of survey conducted in December 2012. The qualitative survey was conducted and funded by the European bank for Reconstruction and Development's Business Advisory Services in cooperation with expert organization specialized in sustainable energy Central European Development Forum, CEDEF and marketing and public opinion research agency MASMI.

According to results of the survey, participants rated the general level of awareness of rational energy consumption in Serbia as very low among SMEs and citizens. It is perceived that the reason for this is the fact that many SMEs are struggling to remain on the market, and that for them energy saving remains a low priority. It is also considered that the State and the media are not making enough effort to inform the public about the importance of rational energy consumption. One of participants said: *"The implementation of the energy passports has little or no media coverage"*. (EBRD study 2012, p. 5)

The financial benefits of implementing EE are more evident, especially in the time of crisis when saving on each and every cost is a priority. Along with the low level of awareness of the importance of EE, there is a problem with the lack of awareness of the professional staff in companies about EE measures. Education about this subject

is also important to the workers who install the building materials. A low electricity price is sometimes perceived as linked with the lack of awareness and irrational spending. (Another survey participant commented: *"As long as the price of electricity is low, there will be no EE!"*). (EBRD study 2012, p. 6)

On the other hand, electricity is considered to be a large item in the budget precisely because of the irrational spending (*"The sole price of kilowatt is low, but we use very expensive electricity in higher zones because we have a bad attitude towards the expenditure."*) (EBRD study 2012, p. 7)

While the companies are somewhat familiar with the legislation concerning a narrow area of their business, legislation related to EE is, in most cases, unknown to SMEs in Serbia. For consultants and businesses that have tried to advance their EE, legislation is often perceived as an obstacle. It is highlighted, for the improvement in this area that appropriate legislation should be passed as soon as possible, as this would secure benefits for enterprises implementing EE measures and fines would be incurred by those that do not comply with the law.

6 WAYS OF IMPROVING EE AND WILLINGNESS TO ENGAGE ADVISORY ASSISTANCE

Various measures of improving EE are, or are to be, implemented in SMEs such as boiler replacement, installation of heat pumps (that use sub-terrain water), isolation, installation of more efficient lighting systems, utilization of solar heat power. Experiences of companies and consultants that worked on these kinds of projects show that there are many achieved benefits: a significant decrease in energy consumption would be evident in lower monthly bills. Furthermore, there are indirect benefits for manufacturing companies through increased market competitiveness due to the effect lower energy consumption costs would have on the price of final products (*"I think that today, in any kind of manufacturing and final product price, the biggest savings can be made by rational consumption of energy"*). (EBRD study 2012, p. 8) Also, the ecological component is perceived to be the stimulation of some companies (*"Besides saving on heat, the emission of carbon dioxide would drop by 97%"*, *"Cleaner*

production"). (EBRD study 2012, p. 9) It is considered that many businesses are not aware how quickly this investment can repay itself (often around 3 years and sometimes even less).

Regarding advisory assistance the general view is that SMEs in Serbia need advisory assistance in the area of improving EE, both in legislation and administration, and in technical solutions and financing issues. Due to their size, SMEs rarely have professionals capable of dealing with the issues of improving EE and financing (bigger enterprises on the other hand, prepare the majority of projects themselves, both the financial and technical sections). In the SME's sector there is no clear idea where to find advisory assistance, the sources of it are mainly perceived as unfamiliar or inaccessible. Known sources of information are manufacturers of EE equipment and consultant agencies while public institutions are not counted on for information. They also rarely perceive international and nongovernmental organizations as sources of information.

Equipment manufacturers are perceived as accessible and competent sources of information ("If I wanted to improve my lighting system, I would turn to the major company in that field, for heat pumps to some of the renowned manufacturers, and I would leave everything to their project teams."). (EBRD study 2012, p. 10) Still, many emphasize that there is also certain mistrust because of the primary interest of the manufacturers to sell their own material and equipment. Manufacturers perceive this "justifiable mistrust" as a major problem that represents an obstacle for more successful communication and cooperation with clients ("When we inform our clients about the profitability of our solution we are playing both the role of manufacturer and consultant, as someone who is persuading the client, so the client may not trust us, and for good reason!"). (EBRD study 2012, p. 11)

As a way to overcome this mistrust, some point to the need of having reports made by the independent authorities in the field of EE that would be available to companies. On the other hand, some of the manufacturers decide to use their own example to demonstrate the advantages of the offered solutions, arouse interest and build a customers' trust ("We, as a firm tried to set an

example to ourselves and to others, we built the EE business object so that we could demonstrate that the item is both useful and usable"). (EBRD study 2012, p. 12)

7 CONSULTANTS AS A SOURCE OF ADVISORY ASSISTANCE

Based on the opinion of the survey participants, consideration and affinity towards using consultant's services among SMEs is at a very low level. Lack of awareness of consulting services, perception of high price, problems in finding a competent consultant and insufficient availability of consulting services outside of Belgrade are perceived to be most important barriers towards using consulting services in the SME sector.

Consideration of the engagement of consulting services in SME sector is on a low level, because often businesses don't have enough information about consultants and their services. Companies outside of Belgrade consider the use of consulting services even less available because they believe that consultants work mainly in Belgrade. A significant number of companies dismiss the idea because they perceive prices of consulting services too high. Consultants perceive the price as the strongest barrier, their experience shows that companies gladly use consulting services and follow received instructions when they get financial assistance for it ("When USAID was involved in financing, 100 food industry companies used consulting service, no one refused!"). (EBRD study 2012, p. 13)

Due to the lack of known information sources about consultants, SMEs usually find out through business partners and acquaintances, such engagements normally are contracted through recommendations. Businesses perceive these kinds of services as a rather unknown novelty and therefore remain unsure about any real indicators of consultants' quality. Beside recommendations, when evaluating the suitability of a consultant, references feature as an important criteria. Nevertheless, in some cases references also prove to be misleading.

("In the end I concluded that the longer consultants reference list was, the more I questioned how it was possible for a consultant to participate in that many projects?"). (EBRD study 2012, p. 14)

8 FINANCIAL ASSISTANCE AS A SOURCE FOR IMPROVING EE IN SMES SECTOR

The survey's participants pointed out that SMEs are mainly not aware about the possibilities of obtaining financial assistance for projects involving improvements in EE. These kinds of projects are financed by either personal resources or bank loans, often raised on commercial terms. Many companies are not aware that they can diversify their financial assistance by obtaining funds from various sources, which can substantially decrease their own personal investment. On the other hand, it is important that the consultants are informed about as many sources of financing as possible, because having appropriate financial assistance significantly raises the willingness of companies to use consulting services, but also because it determines the project setup.

The government is criticized due to its lack of effort in developing financing sources for EE projects. One of the suggestions is to rationalize energy spending on a state level and then use those saved funds for EE projects (*"Financing EE should be systemically solved, last winter we imported Euros 300 million worth of electricity. If we had optimized the spending those 300 million could now be in some fund"*). (EBRD study 2012, p. 14)

9 KEY BARRIERS FOR SMES TOWARDS IMPLEMENTING EE PROJECTS AND WAYS TO OVERCOME THEM

According to the participants, the lack of awareness of SMEs about the multiple benefits of implementing projects concerning EE and the value of the initial investment are the main barriers that stand in the way of implementing them more often. It is known that SMEs often work in difficult circumstances, so they don't even think of implementing EE projects. Companies believe that it is very risky to invest large funds, and don't consider long-term project profitability. Initial investment is also an important barrier due to the liquidity issues, generally unfavorable conditions in Serbia, and the inability to collect that consistent stable business (*"Every day more companies find out about these loans, but they postpone projects for better times, liquidity is more important to*

them!"). (EBRD study 2012, p. 15) Several ways were proposed for overcoming these barriers:

- If there was more information about the sources of financial assistance for EE projects, initial investment would be perceived as less of an obstacle. Financial aid is shown to be a major incentive, even more important than savings projections. Consultants can help overcome this barrier by offering information about the sources of financial assistance (based on the specifics of each case, they can evaluate which source is the most cost-effective solution) and by mediating between the client and the financial source.
- It is important to put into perspective the perceived risk of these investments by putting forward arguments and by informing the companies the time period it will take for the investment to be repaid and then the financial benefit it can expect from implementing it (*"If you explain to companies that the annual saving is near or equal to the loan made for the investment, then there is no reason for them to refuse"*).
- Some participants suggest that the payment of consulting services and materials could be made after the project implementation, when EE results could be measurable and visible.
- Higher availability of advisory services could also be found in establishing consultant firms that would be in charge of tracking EE on behalf of several SMEs, due to the fact that SMEs often cannot afford to engage a person responsible for its EE.

When a company finally decides to engage consultants, it often doesn't know how to reach them and, subsequently, how to assess their expertise when they do. This is due to the fact that consulting practice is not yet widespread in Serbia, and companies often doubt consultant's competence. Several ways have been suggested on how to check the competence and reputation of a consultant:

- Certification is seen as one of the ways to ensure a consultants credibility and to facilitate the selection of a competent consultant specializing in a specific area.

- Choice by tender is a good solution because the tender results are not binding, and the company can get more offers and assess the quality in that way.
- A system of recommendations consultants received from previous clients (with their contact details) could be a more reliable and informative way to assess the quality of consultants than just by a reference system.

Large amounts of financial assistance implies demanding and lengthy procedures, which can discourage some companies from applying due to the lack of time and resources (*"The procedure can last for a year, and that's a very hard journey"*). (EBRD study 2012, p. 15) One of the ways companies can cope with this problem is to engage a consultant which would help with the documentation collection process.

State administration and problems with the application of laws that regulate the field of EE complicate the application process for financial assistance, and thus further discourages interest in EE projects. Some suggestions were listed:

- Increasing media attention for this issue is seen as a good way to influence the government.
- Administration should be less bureaucratic (*"The focus should be on business!"*). (EBRD study 2012, p. 15)
- Government should make these projects more available (*"We don't have as many favorable sources of financing as do other markets"*). (EBRD study 2012, p. 15)

Initiating an EE project is not a sure sign that the project will ultimately be implemented and brings benefits to the company. The general experience of consultants shows that strong resistance among workers could appear, primarily because of a change in the work routine (*"You can implement any measure you like, but if a worker pushes the button or unwinds the valve there is no measure that will make any significant effect"*) (EBRD study 2012, p. 16) A consultant can be seen as someone who endangers their positions by highlighting the errors made in the system (*"They saw my role there as someone who came to show how the workers were not doing their jobs well, and that they may get fired because of my*

analysis"). (EBRD study 2012, p. 17) Everyone agrees that management commitment is essential for working out these problems with employees. According to participants' statements, for the positive effects of the project, consultants should facilitate the education of workers about the importance of EE for the company. They could develop and increase EE awareness and consequently change the attitude towards the working process.

10 CONCLUSION

Serbia, a member of Energy Community of South East Europe has harmonized the regulatory environment concerning energy with the EU directives. In the scope of the current Serbian Energy Strategy, energy efficiency (EE) has been recognized as the second priority of the economical use of quality energy products. Industry in Serbia uses 34% of final energy consumption. Companies in Serbia predominantly use electricity, the most energy inefficient and expensive form of heat generation, so overspending is the consequence, resources are drained, and pollution increases. Two major factors contribute to the lower level implementation of EE management in Serbia: lack of information and more competitive funding schemes.

The level of importance and implementation of EE management among Serbian small and medium enterprises (SMEs) was a topic of survey conducted in December 2012. The participants rated the general level of awareness of rational energy consumption in Serbia as very low among SMEs. It is perceived that the reason for this is the fact that many SMEs are struggling to keep the business going, and that for them energy saving remains a low priority. It is also considered that the State and the media are not making enough effort to inform the public about the importance of rational energy consumption. Regarding advisory assistance in the domain of EE the general view is that SMEs in Serbia need advisory assistance in the area of improving EE, both in legislation and administration, and in technical solutions and financing issues.

The survey's participants pointed out that SMEs are mainly not aware about the possibilities of obtaining financial assistance for projects

involving improvements in EE. These kinds of projects are financed by either personal resources or bank loans, often raised on not attractive commercial terms. The government is criticized due to its lack of effort in developing financing sources for EE projects.

Several ways were proposed for overcoming these barriers: more information about the sources of financial assistance for EE projects, consultants can help overcome this barrier by

offering information about the sources of financial assistance; payment of consulting services and materials could be made after the project implementation, when EE results could be measurable and visible; higher availability of specialist advisory services; increasing media attention as a means of influencing the government to make administration less bureaucratic; government should make more sources of financing available to SMEs.

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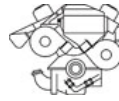
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